Newark Board Of Education

Second Grade Science Curriculum

Roger León, Superintendent
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2021

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Office of Teaching and Learning Philosophy

The Office of Teaching and Learning believes that educating our students requires children to pursue learning in ways that are culturally engaging and academically rigorous. In order to accomplish this goal, we understand curriculum as dynamic rather than static. This means the teacher is always in conversation with the curriculum as informed by student voice, needs, strengths, culture, interests, and the world. Curriculum documents are not meant as scripts to dictate what happens each moment in the classroom, but instead serve as guides to create lived moments that are full of invention, inquiry, joy, creativity, and academic rigor. We believe that curriculum should be culturally responsive and sustaining, putting the student at the center of the learning process.

The success of curricular implementation calls for teachers to make informed choices as they use the materials in meaningful and purposeful ways. These choices include, but are not limited to making learning student-centered, differentiating learning, and infusing past and current events to critique the world. Both teachers and students bring with them a wealth of knowledge and experience to the classroom. These experiences are a resource that should be leveraged to make choices that continually invent and reinvent the curriculum.

The Office of Teaching & Learning values:

- Teachers as Intellectuals,
- Culturally Responsive and Sustaining Teaching,
- Equity, and Academic Rigor.

The Office of Teaching & Learning affirms the following beliefs:

- We believe in the power and freedom of inquiry, imagination, and joy.
- We believe that all students bring with them valuable knowledge.
- We believe that the knowledge and expertise of teachers is critical to the development, implementation, and success of the curriculum process.
- We believe that teachers should co-construct curriculum with students.
- We believe that teachers are advocates of students.
- We believe in teaching and learning that is culturally responsive and sustaining.
- We believe that teaching, learning, and curriculum, as Bettina Love reminds us, should help students thrive instead of merely survive.
- We believe that teaching, learning, and curriculum should move us toward social justice and a more equitable society.
- We believe teaching, learning, and curriculum should develop the critical consciousness of learners and asks them to identify, analyze, and deconstruct various forms of oppression that affect their lived realities.
- We believe teaching, learning, and curriculum should be trauma-informed and consider the ways young people are affected by their environments.
- We believe, as bell hooks reminds us, that teachers, like any helping professional, are healers and that curriculum should be a reflection of a healing environment.
- We believe that teaching, learning, and curriculum should be anti-racist and help students identify bias, reduce stereotypes, and develop a sense of social justice.
- We believe that curriculum and instruction should be inclusive, valuing all students as an asset to the learning environment.
- We believe in the importance of continuous professional growth for all educators in order to develop a growth mindset and remain intellectually stimulated.
- We believe in the importance of preparing students for college and careers in the twenty first century.

Statement on Culturally Responsive-Sustaining Education

Through a Culturally Responsive-Sustaining Education (CR-SE) framework for curriculum and instruction, each content area includes inquiry-based, culturally responsive, and student-centered prekindergarten to grade twelve curricula that is designed to meet the needs of all students. In a districtwide effort to establish a culture of equity, *Clarity 2020* calls for a "A Rigorous and Relevant Framework for Curriculum & Instruction" (Priority 2). This means reimagining the landscape of teaching and learning to see diversity and difference as indispensable assets that should be leveraged for student engagement in classrooms with high expectations.

Our curriculum draws on the backgrounds, identities, and experiences of our students to make their connections to learning relevant and meaningful. Understanding the role of culture in the process of education means thinking about the ways identity (race, ethnicity, gender, sexual orientation, language, social class, nationality, ability, and religion) influences teaching and learning, gets reflected in the curriculum, and affects each individual student's educational experience.

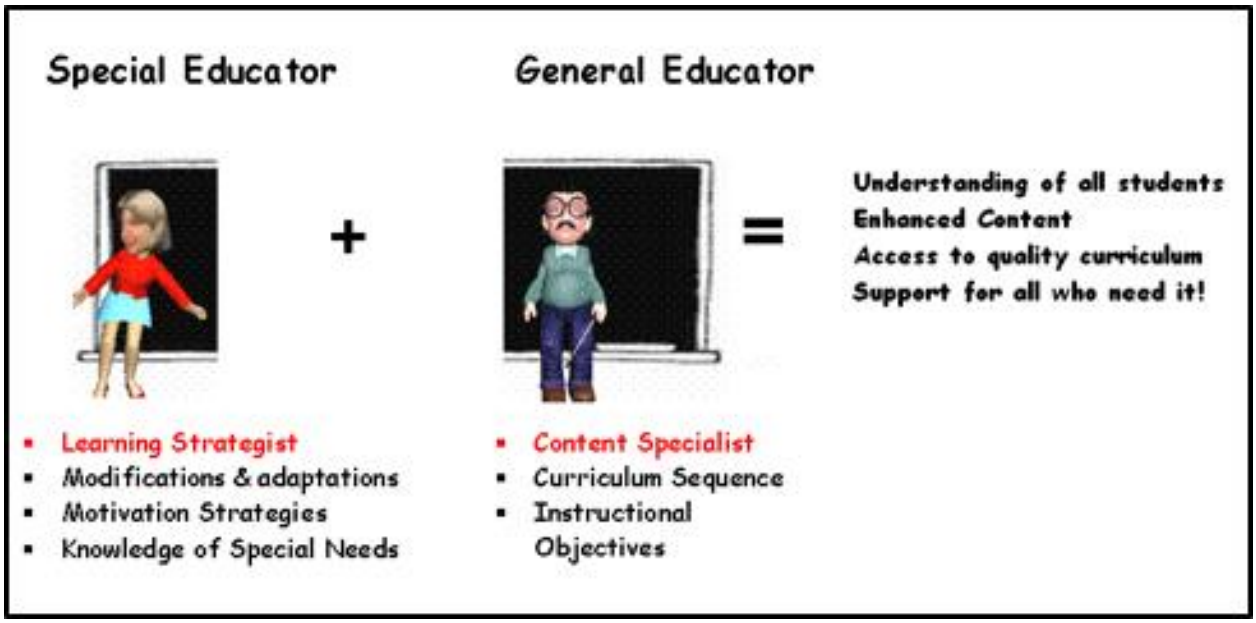
Developing the media literacy, critical consciousness, and civic engagement of students in the twenty first century is a priority that must happen alongside the growth of academic skills. This is an interdisciplinary, democratic, and socially just approach to culturally responsive teaching that highlights the injustices that have characterized vast inequalities in the education system. A culturally responsive-sustaining approach to teaching necessitates that teachers and students work alongside one another to confront bias and disrupt educational inequities.

Studies across the country have shown that Culturally Responsive-Sustaining Education (CR-SE), "increases student participation, attendance, grade point averages, graduation rates, civic engagement, self-image, and critical thinking skills" (NYC DOE). This approach to teaching and learning requires an inclusive curriculum that integrates support for English Language Learners, students with disabilities, students at risk of school failure, gifted and talented students, and students with 504 plans. It is a framework for teaching that means advocating for students who have been historically marginalized and denied access to an equal education by creating opportunities for these students to be educated alongside their general education peers. It also involves the identification of successful practices that reduce referrals and placements in more restrictive environments.

Through the implementation of a plan to integrate civics, the Amistad Curriculum, and Holocaust/Genocide studies at all grade levels across the district, students will learn about the history of Newark, the contributions of African Americans and other ethnic groups to the city, and how to become civically engaged, democratic citizens in the twenty first century. Further, students will learn about the evils of bias, prejudice and bigotry and how these may lead to a genocide and that the evil period of slavery in the United States exhibited a

number of components seen in genocides throughout the centuries. This curricula, project-based and interdisciplinary in nature, spans the content areas and grade levels.

Integrated Accommodations and Modifications for Special Education Students, English Language Learners, Students At Risk of School Failure, Gifted and Talented Students, and Students with 504 Plans



Co-Teaching Handbook

Co-Teaching Models

One Teach, One Observe: One of the advantages in co-teaching is that more detailed observation of students engaged in the learning process can occur. With this approach, for example, co-teachers can decide in advance what types of specific observational information to gather during instruction and can agree on a system for gathering the data. Afterward, the teachers should analyze the information together. The teachers should take turns teaching and gathering data, rather than assuming that the special educator is the only person who should observe.

Station Teaching: In this co-teaching approach, teachers divide content and students. Each teacher then teaches the content to one group and subsequently repeats the instruction for the other group. If appropriate, a third "station" could give students an opportunity to work independently. As co-teachers become comfortable with their partnership, they may add groups or otherwise create variations of this model.

Parallel Teaching: On occasion, students' learning would be greatly facilitated if they just had more supervision by the teacher or more opportunity to respond. In parallel teaching, the teachers are both teaching

the same information, but they do so to a divided class group within the same room. Parallel also may be used to vary learning experiences, for example, by providing manipulatives to one group but not the other or by having the groups read about the same topic but at different levels of difficulty.

Alternative Teaching: In most class groups, occasions arise in which several students need specialized attention. In alternative teaching, one teacher takes responsibility for the large group while the other works with a smaller group. These smaller groups could be used for conferences, remediation, pre-teaching, to help students who have been absent catch up on key instruction, assessment, and so on.

How can the various models and co-partner roles help?

- It increases the Instructional Intensity for students. Instruction is least effective if one teacher is "off" while the other teacher is "on". For example the most common ICS model, "One Teach One Assist" is the least effective if implemented every day. For improved results, both teachers should be engaged with students at the same time.

- The use of various ICS Models promotes and embeds differentiation of instruction, flexible grouping, unique discussion and questioning techniques.

- Be sure to explain to students and parents the benefits of two teachers. Avoid using the term "special education or special education teacher" to describe the environment. Instead, use terms such as Content Specialist and Learning Strategist to define your roles.

- When providing feedback, consider using different pen/ink colors (stay away from red). This reduces confusion when students have a question to ask.

- It helps to establish a more balanced role of authority between co-partners. Students need to experience instruction and directives from both co-partners.

Adaptations

Instructional adaptations for students with disabilities, English Language Learners, students At Risk of School Failure, Gifted and Talented students, and students with 504 plans include, but are not limited to, the below approaches. For students with disabilities, self-determination and interdependence are two core principles of citizenship education that apply directly to their educational needs and interests.

Student Motivation: Expanding student motivation to learn content and acquire skills in English Language Arts can occur through: activity choice, appeal to diverse learning styles, choice to work with others or alone, hands-on activities, and multimodal activities.

Instructional Presentations: The primary purpose of these adaptations is to provide special education students with teacher-initiated and teacher-directed interventions that prepare students for learning and engage students in the learning process (Instructional Preparation); structure and organize information to aid comprehension and recall (Instructional Prompts); and foster understanding of new concepts and processes (Instructional Application) e.g. relating to personal experiences, advance organizers, pre-teaching vocabulary and/or strategies; visual demonstrations, illustrations, mode**ls.**

Instructional Monitoring: Social Studies and English Language Arts instruction should include opportunities for students to engage in goal setting, use of anchor papers, work with rubrics and checklists, reward systems, conferences.

Classroom Organization: The primary purpose of classroom organization adaptations is to maximize student attention, participation, independence, mobility, and comfort; to promote peer and adult communication and interaction; and to provide accessibility to information, materials, and equipment.

Student Response: The primary purpose of student performance responses is to provide students with disabilities a means of demonstrating progress toward the lesson objectives related to reading and writing activities.

SAMPLE DIFFERENTIATION STRATEGIES AND ACTIVITIES TO ENRICH LEARNING FOR ADVANCED STUDENTS

Anchor Activities: Self-directed specified ongoing activities in which students work independently.

Curriculum Compacting: Curriculum Compacting is an instructional technique that is specifically designed to make appropriate curricular adjustments for students in any curricular area and at any grade level. Essentially, the procedure involves (1) defining the goals and outcomes of a particular unit or segment of instruction, (2) determining and documenting which students have already mastered most or all of a specified set of learning outcomes, and (3) providing replacement strategies for material already mastered through the use of instructional options that enable a more challenging and productive use of the student's time.

Flexible Grouping: Flexible grouping is a range of grouping students together for delivering instruction. This can be as a whole class, a small group, or with a partner. Flexible grouping creates temporary groups that can last an hour, a week, or even a month.

Jigsaw Activities: Jigsaw is a strategy that emphasizes cooperative learning by providing students an opportunity to actively help each other build comprehension. Use this technique to assign students to reading

groups composed of varying skill levels. Each group member is responsible for becoming an "expert" on one section of the assigned material and then "teaching" it to the other members of the team.

Differentiated Instruction - English Language Learners

English Language Development Standards

ENGLISH LANGUAGE LEARNERS

Instructional Supports:

- Hands-on materials
- bilingual dictionaries
- visual aids
- teacher made adaptations, outlines, study guides
- varied leveled texts of the same content
- assisted technologies

Preparing students for lessons:

1. Building Background Information through brainstorming, semantic webbing, use of visual aids and other comprehension strategies.
2. Simplifying Language for Presentation by using speech that is appropriate to students' language proficiency level. Avoid jargon and idiomatic speech.
3. Developing Content Area Vocabulary through the use of word walls and labeling classroom objects. Students encounter new academic vocabulary in literature, editing conventions, and the study of language arts.
4. Giving Directions - Stated clearly and distinctly and delivered in both written and oral forms to ensure that LEP students understand the task. In addition, students should be provided with/or have access to directional words such as: circle, write, draw, cut, underline, etc.

5. Leveraging assisted technologies.

WIDA Language Proficiency Levels

Performance Definitions for the levels of English language proficiency

At the given level of English language proficiency, English language learners will process, understand, produce, or use:

6 Reaching	• specialized or technical language reflective of the content area at grade level • a variety of sentence lengths of varying linguistic complexity in extended oral or written discourse as required by the specified grade level • oral or written communication in English comparable to proficient English peers
5 Bridging	• the technical language of the content areas; • a variety of sentence lengths of varying linguistic complexity in extended oral or written discourse, including stories, essays, or reports; • oral or written language approaching comparability to that of English proficient peers when presented with grade level material
4 Expanding	• specific and some technical language of the content areas; • a variety of sentence lengths of varying linguistic complexity in oral discourse or multiple, related paragraphs; • oral or written language with minimal phonological, syntactic, or semantic errors that do not impede the overall meaning of the communication when presented with oral or written connected discourse with occasional visual and graphic support
3 Developing	• general and some specific language of the content areas; • expanded sentences in oral interaction or written paragraphs; • oral or written language with phonological, syntactic, or semantic errors that may impede the communication but retain much of its meaning when presented with oral or written, narrative or expository descriptions with occasional visual and graphic support
2 Beginning	• general language related to the content areas; • phrases or short sentences; • oral or written language with phonological, syntactic, or semantic errors that often impede the meaning of the communication when presented with one to multiple-step commands, directions, questions, or a series of statements with visual and graphic support
1 Entering	• pictorial or graphic representation of the language of the content areas; • words, phrases, or chunks of language when presented with one-step commands, directions, WH-questions, or statements with visual and graphic support

The five language proficiency levels outline the progression of language development implied in the acquisition of English as an additional language, from 1, Entering the process, to 6, Reaching the attainment of English language proficiency. The language proficiency levels delineate expected performance and describe what ELLs can do within each domain of the standards. The Performance Definitions define the expectations of students at each proficiency level. The definitions encompass three criteria: linguistic complexity—the amount and quality of speech or writing for a given situation; vocabulary usage—the specificity of words or phrases for a given context; and language control—the comprehensibility of the communication based on the amount and types of errors.

Assessments (including, formative, summative, benchmark, and alternative assessments)

- *NJSLA* (Grades 5, 8, and 11)
- Daily Instructional Tasks
- Culminating Tasks
- Extended Learning Tasks
- Entry Tasks
- Independent Practice
- Observation
- Lab Reports
- Performance tasks
- Exhibitions and demonstrations
- Portfolios
- Journals/Notebooks
- Teacher-created tests
- Rubrics
- Self- and peer-evaluation

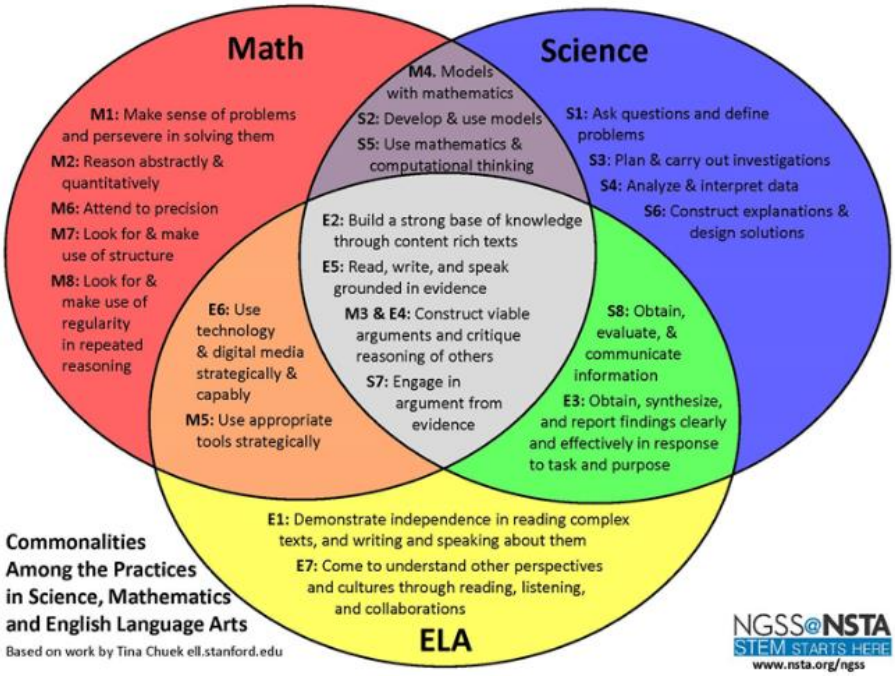
Core Instructional Materials

Inspire Science, McGraw Hill, 2020

Interdisciplinary Connections

Integrating Language Arts Literacy and Mathematics

In order to support student learning, teachers need to emphasize the mutual skill sets that occur in two very important and nicely aligned subject areas. Making explicit connections to ELA and Mathematics will help students see the natural relationships to science. The curricular documents call out math and ELA standards that appear in each unit of study.



Integration of 21st Century Skills

The following standards are addressed within the units:

- 9.1.4.A.1 Explain the difference between a career and a job and identify various jobs in the community and the related earnings.
- 9.1.4.A.2 Identify potential sources of income.
- 9.1.4.A.3 Explain how income affects spending and take-home pay.
- 9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.
- 9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.
- 9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.
- 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Office of Teaching and Learning
Second Grade Science

Course Description

Students in second grade formulate answers to questions such as: “How does land change and what are some things that cause it to change? What are the different kinds of land and bodies of water? How are materials similar and different from one another, and how do the properties of the materials relate to their use? What do plants need to grow? How many types of living things live in a place?” Students apply their understanding of the idea that wind and water can change the shape of the land to compare design solutions to slow or prevent such change. Students use information and models to identify and represent the shapes and kinds of land and bodies of water in an area and where water is found on Earth. An understanding of observable properties of materials is developed by students at this level through analysis and classification of different materials. Students develop an understanding of what plants need to grow and how plants depend on animals for seed dispersal and pollination. Students also expected to compare the diversity of life in different habitats. The crosscutting concepts of patterns; cause and effect; energy and matter; structure and function; stability and change; and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade appropriate proficiency in developing and using models, planning and carrying out investigations, analyzing and interpreting data, constructing explanations and designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding.

Curriculum Map

Standards: Physical Science	Properties of Matter	**Changes to Matter**	**Earth's Surfaces**	**Earth's Surface Changes**	**Living Things in Habitats**	**Plants and Their Needs**
PS1.A.1: Structure and Properties of Matter Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties.	✓	✓				
PS1A.2: Different properties are suited to different purposes.	✓	✓				
PS1A.3: A great variety of objects can be built up from a small set of pieces.	✓	✓				
PS1.B.1: Chemical Reactions Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.		✓				
Standards: Life Science	**Properties of Matter**	**Changes to Matter**	**Earth's Surface**	**Earth's Surface Changes**	**Living Things in Habitats**	**Plants and Their needs**
LS2.A.1: Interdependent Relationships in Ecosystems Plants depend on water and light to grow.						✓
LS2.A.2: Interdependent Relationships in Ecosystems Plants depend on animals for pollination or to move their seeds around.						✓
LS4.D.1: Biodiversity and Humans There are many different kinds of living things in any area, and they exist in different places on land and in water.					✓	

Standard: Earth and Space: ESS1: Earth's Place in the Universe	Properties of Matter	Changes to Matter	Earth's Surface	Earth's Surface Changes	Living Things in Habitats	Plants and Their Needs
ESS1.C.1: The History of Planet Earth Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe.				✓		
ESS2.A.1: Earth Materials and Systems Wind and water can change the shape of the land.				✓		
ESS2.B.1: Plate Tectonics and Large-Scale System Interactions Maps show where things are located. One can map the shapes and kinds of land and water in any area.			✓			
ESS2.C.1: The Roles of Water in Earth's Surface Processes Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form.			✓			

Pacing Guide

Units		Standards Areas	Pacing (# of lessons, # of days)
1	Properties of Matter	PS1.A: Structure and Properties of Matter	4 lessons 35 days
2	Changes to Matter	PS1.A: Structure and Properties of Matter PS1.B: Chemical Reactions	3 lessons 30 days
3	Plants and their Needs	LS2.A: Interdependent Relationships in Ecosystems LS2.A: Interdependent Relationships in Ecosystems	3 lessons 28 days
4	Living things in Habitats	LS4.D: Biodiversity and Humans	4 lessons 35 days
5	Earth's Surface Changes	ESS1.C: The History of Planet Earth ESS2.A: Earth Materials and Systems	3 lessons 30 days
6	Earth's Surface	ESS2.B: Plate Tectonics and Large-Scale System Interactions. ESS2.C: The Roles of Water in Earth's Surface Processes.	3 lessons 30 days

Module: Properties of Matter

Stage 1 – Desired Results

ASSESSED FOCUS STANDARDS:

PS1.A: Structure and Properties of Matter

- Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1)
- Different properties are suited to different purposes. (2- PS1-2),(2-PS1-3)
- A great variety of objects can be built up from a small set of pieces. (2-PS1-3)

CONTENT CONNECTIONS:
Primary NJSLS ELA/Literacy Connections:

RI.2.8 Describe how reasons support specific points the author makes in a text.

W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).

W.2.8 Recall information from experiences or gather information from provided sources to answer a question.

Unit Description

Anchoring Phenomenon:

Statement: Matter can exist in different forms.
Observation/Demonstration/Experience: Photo of the fruit bars melting in the Sun.
Driving Question: How do we describe matter?

Meaning

ENDURING UNDERSTANDINGS

- Matter is the substance that all things are made of.
- All matter has mass, takes up space, and cannot share the same space with other matter.
- The three common states of matter are solid, liquid, and gas.
- The state of matter can change depending on its temperature.
- Matter is described in terms of properties such as size, mass, shape, color, and specific details of structure.
- Mass is a measure of the amount of matter in an

ESSENTIAL QUESTIONS

- How do we describe matter?
- What are the properties of solids?
- What are the properties of liquids and gases?
- What materials are best for building a boat?

<table>
<tr>
<td rowspan="3">Primary NJSLS Mathematics Connections:

MP.2 Reason abstractly and quantitatively.

MP.4 Model with mathematics.

MP.5 Use appropriate tools strategically.

2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph</td>
<td colspan="2">object. The mass of most objects can be measured with a pan balance.
• Matter that has a shape of its own is called a solid.
• A liquid is a substance that flows to fill the shape of its container.
• The particles that make up a liquid are less tightly packed than the particles that make up a solid, which gives a liquid its fluid property.
• A gas is a substance that does not have any shape.
• Its particles are even farther apart than that of a liquid.
• Volume is simply a measure of space, such as the capacity of a container.
• Properties of materials include strength, elasticity, and durability.</td>
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<tr>
<td colspan="2">What students will know and be able to do</td>
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<tr>
<td>KNOWLEDGE
Lesson 1:
I can make observations to classify different types of matter.
Lesson 2:
I can conduct an investigation to describe the properties of solids.
Lesson 3:
I can conduct an investigation to describe the properties of liquids and gases.
Lesson 4:
I can identify materials that are best suited for an intended purpose.</td>
<td>SKILLS
2-PS1-1:Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.] Planning and Carrying out Investigations; Patterns

2-PS1-2: Analyze data obtained from testing different materials to determine which materials</td>
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		have the properties that are best suited for an intended purpose. * [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [*Assessment Boundary: Assessment of quantitative measurements is limited to length.*] Analyzing and Interpreting Data; Cause and Effect **2-PS1-3** **Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.** [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.] Constructing explanations and designing Solutions; Energy and Matter

Stage 2 – Evidence

SUMMATIVE ASSESSMENT(S)

Lesson 1:

- What's in the Bag? Performance Task

  What's in the Bag? Rubric

Lesson 2:

- Performance Task: Plan an Investigation About Solids

  Plan an Investigation about Solids Rubric

Lesson 3:

- All Three States Performance Task

  Performance Task: All Three States Rubric

Lesson 4:

- Make a Model Performance Task

  Performance Task: Make a Model Rubric

Performance Project:
- Analyze Materials Performance Project
  - Analyze Materials Rubric

Properties of Matter: eAssessments

STEM Gauge K-2

Claim Evidence Reasoning (Evidence Based Writing)

PRE-ASSESSMENT

Page Keeley Science Probe:
- **Lesson 1:** What is Matter?
- **Lesson 2:** Is it a Solid?
- **Lesson 3:** Gases and Liquids
- **Lesson 4:** Clay Boat

Integration of 21st Century Skills	Integration of Technology	Career Education
9.4.2.CI.1: Demonstrate openness to new ideas and perspectives. **9.4.2.CI.2:** Demonstrate originality and inventiveness in work. **9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem. **9.4.2.CT.2:** Identify possible approaches and resources to execute a plan. **9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).	McGraw Hill Digital Resources via CLEVER Hot air balloon Properties of Matter The States of Matter Materials Have a Purpose All About Gas Science Songs Discovery Education What's the Matter? Song Solid, Liquid, Gas Mystery Science Why do we wear clothes? **Science Songs K-2**	**Carpenter** Introduce Career Kid Chloe, who wants to be a carpenter when she grows up. She loves to design and build things. A carpenter is a person who cuts, shapes, and installs building materials. Knowing about the different properties of matter helps a carpenter know when to use materials like wood, metal, or glass. **Aerospace Engineer** Introduce Career Kid Emily, who wants to be an aerospace engineer when she grows up. She's always been fascinated with how things fly. An aerospace engineer is a person who designs and builds machines that fly. Know about the different types of matter is very

		important to be able to build different airplanes.

Stage 3 – Learning Plan

UNIT VOCABULARY

float gas liquid mass	pattern volume matter property	materials float sink solid

SUMMARY OF KEY LEARNING

Lesson 1:Describe Matter

Lesson 1: Day 1 - Module Opener, Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Learning Intention:**
  - I am learning that matter is the substance that all things are made of.
  - I am learning about Aerospace Engineers.
- **Success Criteria:**
  - I can share my written explanation based on the probe with my teammates.
  - I can ask questions about the phenomenon.
  - I can discuss my questions about the phenomenon with my classmates.
  - I can share my thoughts about the role of an aerospace engineer with my teammates.
- **Brief Overview of Lesson:** In the lesson the probe is intended to uncover students' basic ideas about matter. Spark your students' curiosity about the world by introducing the lesson phenomenon of hot air balloons. Introduce Career kid Emily, who wants to be an aerospace engineer when she grows up. Students will share their thoughts and questions about the essential question.

Lesson 1: Days 2&3 - Inquiry Activity and What's the Matter

- **Learning Intention:**
  - I am learning that matter can be solids, liquids, and gases.
  - I am learning that matter takes up space.
- **Success Criteria:**
  - I can explain my prediction.
  - I can identify items that are solid, liquid, or gas.
  - I can analyze and describe how I selected my items.
- **Brief Overview of Lesson:**
  In this lesson students will observe a number of examples of solids, liquids, and gases in their classroom. They will read the Science Paired Read Aloud.

Lesson 1: Days 4-7 Obtain and Communicate Information, Reflect and Refine & Science and Engineering Practices.

- **Learning Intention:**
  - I am learning that matter is all around.
  - I am learning about the properties of matter.
- **Success Criteria:**
  - I can complete a vocabulary concept map.
  - I can create a vocabulary foldable.
  - I can list four properties of matter.
  - I can create a sorting properties bar graph.

- I can discuss patterns I observed in my data.

- **Brief Overview of Lesson:** Vocabulary will be developed using presentation slides, science paired read aloud and foldables. Students will classify matter from the Scavenger Hunt. Students will read Science File: What is matter? to learn about examples of matter and some properties of matter.

Lesson 1: Day 8 - Research, Investigate and Communicate

- **Learning Intention:**
  - I am learning about the mass of matter.
- **Success Criteria:**
  - I can make predictions about matter.
  - I can measure and compare objects' masses**.**
  - I can discuss my findings with my classmates.
- **Brief Overview of Lesson:** In this lesson the students will use a pan balance and compare objects based on mass and other properties.

Lesson 1: Days 9 &10-Performance Task: What's in the Bag?- Essential Question Reflections: *How do we describe matter?*

- **Learning Intention:**
  - I am learning to describe matter.
- **Success Criteria:**
  - I can make predictions about matter.
  - I can describe texture, shape, thickness, length or other properties.
  - I can share my observations with my classmates.
  - I can discuss and share my claim with evidence based on the *EQ:How do we describe matter?*
  - I can demonstrate my learning by completing lesson one assessment.
- **Brief Overview of Lesson:** In this lesson the students will use their sense of touch to describe matter. Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: *How do we describe matter?* Students will see whether and how their thinking has changed. Students will complete lesson one assessment.

Lesson 2: Solids

Lesson 2: Day 1 - Module Opener, Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Learning Intention:**
  - I am learning that matter can be solid.
  - I am learning about Aerospace Engineers.
- **Success Criteria:**
  - I am learning to ask questions about the phenomenon.
  - I can share my written explanation based on the probe with my teammates.
  - I can discuss my questions about the phenomenon with my classmates.
  - I can explain why an Aerospace Engineer might be interested in matter.
- **Brief Overview of Lesson:** This probe is intended to uncover students' basic ideas about solids. Spark your students' curiosity about the world by introducing the lesson phenomenon of oobleck. Students will share their thoughts and questions about the essential question. *What are the properties of solid?*

Lesson 2: Days 2&3 - Inquiry Activity-

- **Learning Intention:**
  - I am learning about the properties of solids.
- **Success Criteria:**
  - I can make a material using water and cornstarch.

- I can describe why oobleck is like a solid.
- I can share my observations from the investigation with my classmates.

- **Brief Overview of Lesson:**
  In this lesson students will make a material and test its properties. They will read the Science Paired Read Aloud about solids.

Lesson 2: Days 4-7 - Obtain and Communicate Information, Reflect and Refine & Science and Engineering Practices

- **Learning Intention:**
  - I am learning about natural solids.
  - I am learning about the properties of solids.
- **Success Criteria:**
  - I can test objects to determine if they are solids.
  - I can explain why some materials are used to make solids.
  - I can explore patterns in nature and in human-made objects.
  - I can complete a vocabulary concept map.
  - I can reflect and revise my response to Page Keeley Science Probe: Is it a Solid?
- **Brief Overview of Lesson:**
  In this lesson students will test objects to determine if they are solid. Students will complete several vocabulary development tasks. They will also read the Science Paired Read Aloud and Science File.

Lesson 2: Day 8 - Research, Investigate and Communicate

- **Learning Intention:**
  - I am learning that a solid can be described by listing the materials they are made of, and their mass.
- **Success Criteria:**
  - I can use a ruler to measure different solids.
  - I can record the measurements on a table.
  - I can compare my measurements to my classmates' measurements.
- **Brief Overview of Lesson:**
  In this lesson students will measure and compare two different solids.

Lesson 2:Days 9 and 10-Performance Task: Plan an Investigation about Solids. Essential Question Reflections: *What are the properties of solids?*

- **Learning Intention:**
  - I am learning about the properties of solids.
- **Success Criteria:**
  - I can plan an investigation.
  - I can write down the steps involved in my investigation.
  - I can share my observations from the activity with my teammates.
  - I can discuss and share my claim with evidence based on the *EQ:What are the properties of solids?*
  - I can demonstrate my learning by completing the lesson.
- **Brief Overview of Lesson:** In this lesson the students will plan an investigation.
  Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: *What are the properties of solid?* Students will see whether and how their thinking has changed. Students will complete lesson one assessment.

Using the Leveled Readers: Solids, Liquids, and Gases

Summary This book explores solids, liquids, and gases.

When to Use this book in the Explain section of Lesson 2 and the Explain section of Lesson 3 after discussing the properties of solids, liquids, and gases. This book serves as an introduction to the properties of these states of matter. Help students understand that matter has different structures and can be classified.

Lesson 3: Liquids and Gases

Lesson 3: Day 1-Module Opener, Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Learning Intention:**
  - I am learning about the properties of liquids and gases.
- **Success Criteria:**
  - I can share my written explanation based on the probe with my teammates.
  - I can discuss my questions about the phenomenon with my classmates.
  - I can wonder and share why an Aerospace Engineer might be interested in ice being heated.
- **Brief Overview of Lesson:** This probe is intended to uncover students' basic ideas about the changes in state between liquids and gases. Spark your students' curiosity about the world by introducing the lesson phenomenon of ice being heated. Students will share their thoughts and questions about the essential question. *What are the properties of liquids and gases?*

Lesson 3: Days 2 &3- Inquiry Activity: Measuring Liquids

- **Learning Intention:**
  - I am learning that water has volume.
- **Success Criteria:**
  - I can make a prediction about water heights in different containers.
  - I can compare a liquid in different containers.
  - I can create a model of containers of water at varying levels.
- **Brief Overview of Lesson:**

In this lesson students will pour a certain volume of water into different containers and observe where the water height is in each container.

Lesson 3: Days 4-7-Obtain and Communicate Information, Reflect and Refine, Science and Engineering Practices & Inquiry Activity

- **Learning Intention:**
  - I am learning that it is important to utilize the following vocabulary (volume) when explaining liquids.
  - I am learning about the properties of liquids.
  - I am learning about the properties of gases.
- **Success Criteria:**
  - I can list and explain different types of liquids.
  - I can explore the Digital Interactive *All about Gases.*
  - I can compare liquids and gases using a Venn diagram.
  - I can reflect and revise my response to Page Keeley Science Probe: Gases and Liquids.
  - I can complete a vocabulary concept map.
- **Brief Overview of Lesson:**

  In this lesson students will discover that liquids and gases are states of matter and have observable properties.

Students will complete several vocabulary development tasks. They will also read the Science Paired Read Aloud and Science File.

Lesson 3: Day 8 - Research, Investigate and Communicate, Inquiry Activity: Gassy Bubbles

- **Learning Intention:**
  - I am learning about the properties of gas.
- **Success Criteria:**
  - I can create a question to investigate.
  - I can sequence the steps of an investigation.
  - I can create bubbles in soapy water using air, a gas, from their lungs.
  - I can explain to my classmates why it is important to carefully plan an investigation.
- **Brief Overview of Lesson:**

  In this lesson students will participate in the planning of the investigation by putting the given steps in the correct order. Then students will carry out the investigation.

Lesson 3: Days 9 and 10- Performance Task:All Three States. Essential Question Reflections: *What are the properties of liquids and gases?*

- **Learning Intention:**
  - I am learning that water can change from a solid to a liquid to a gas.
- **Success Criteria:**
  - I can make a prediction about what will happen to the ice cube when it is left in the Sun.
  - I can share my observations with my classmates.
  - I can compare my results to my classmates' results.
  - I can discuss and share my claim with evidence based on the *EQ:What are the properties of liquids and gases?*
  - I can demonstrate my learning by completing the lesson assessment.
- **Brief Overview of Lesson:** In this lesson the students will put an ice cube, which is solid water, in a plastic cup covered with plastic wrap. They will observe the ice cube melt into liquid water when heated in a sunny spot in the classroom.

  Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: *What are the properties of liquids and gases?* Students will see whether and how their thinking has changed. Students will complete lesson three assessments.

Using the Leveled Readers: Gases Matter

Summary This book focuses on the importance of gases.

When to Use this book in the Explain section of Lesson 3 after discussing the properties of gases. This book serves as an introduction to the use and importance of gases in our everyday lives. Help students understand that many gases are vital for life on Earth.

Lesson 4: Use Matter

Lesson 4: Day 1-Module Opener, Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Learning Intention:**
  - I am learning about properties of matter strength, elasticity and durability.
  - I am learning to ask questions about the phenomenon.
  - I am learning about Aerospace Engineers.
- **Success Criteria:**

- I can share my written explanation based on the probe with my teammates.
- I can discuss my questions about the phenomenon with my classmates.
- I can discuss with my classmates what an Aerospace engineer has to do with understanding different materials or matter.

- **Brief Overview of Lesson:** This probe is intended to uncover students' basic ideas about how some properties of matter can be used to change matter for specific purposes. Spark your students' curiosity about the world by introducing the lesson phenomenon of boats. Students will share their thoughts and questions about the essential question. *What materials are best for building a boat?*

Lesson 4: Days 2&3 Inquiry Activity: Material Mix-Up and Material Matters

- **Learning Intention:**
  - I am learning that different properties are suited for different purposes.
- **Success Criteria:**
  - I can explain how to make a boat.
  - I can create a model of a boat.
  - I can test to see if my boat will float.
  - I can read and answer questions using the Science Paired Read Aloud.
- **Brief Overview of Lesson:**

In this lesson the students will sketch a model boat that uses the provided materials. The goal is for the boat to hold a small eraser while floating on water. Students will then build and test their boats and sketch their results.

Lesson 4: Days 4&5--Obtain and Communicate Information, Testing Materials Simulation, Matter, Properties, and Making Things, Materials Have a Purpose

- **Learning Intention:**
  - I am learning that different properties are suited for different purposes.
  - I am learning about the properties of different materials.
- **Success Criteria:**
  - I can test different materials to determine their properties.
  - I can complete a vocabulary concept map.
  - I can complete the cause and effect graphic organizer.
  - I can read and respond to the text *Matter, Properties, and Making Things.*
- **Brief Overview of Lesson:**

  In this lesson students will participate in several vocabulary development tasks. They will explore a simulation to test different materials to determine their properties.

Lesson 4: Days 6&7- Quick Check, Refine and Refine, Research, Investigate, and Communicate: Inquiry Activity: Boat Research

- **Learning Intention:**
  - I am learning that different properties are suited for different purposes.
- **Success Criteria:**
  - I can reflect and revise my response to Page Keeley Science Probe: Clay Boat.
  - I can demonstrate how to choose the best materials for a purpose by completing a sequence graphic organizer.
  - I can research materials used to build different types of boats.
- **Brief Overview of Lesson:**

  This lesson provides an opportunity to do a quick assessment to determine if students are ready to move on. Students will conduct research on boats.

Days 8-10- Performance Task: Make a Model, Essential Question Reflections: *What are the properties of solids?* Performance Project- Analyze Materials

- **Learning Intention:**
  - I am learning about the best materials to build a boat.
- **Success Criteria:**
  - I can plan, construct, and test a model boat.
  - I can compare my boat with my classmates' boats.
  - I can discuss and share my claim with evidence based on the *EQ:What materials are best for building a boat?*
  - I can demonstrate my learning by completing the lesson assessment.
- **Brief Overview of Lesson:** In this lesson the students will use what they have learned about materials, their properties, and how to choose the best materials for a purpose in order to plan and build a model boat design using available classroom materials.
  Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: *What materials are best for building a boat?* Students will see whether and how their thinking has changed. Students will complete lesson four assessment.

CULTURALLY RESPONSIVE TEACHING in PRACTICE	**SOCIAL EMOTIONAL LEARNING in PRACTICE**

A culturally responsive approach to science instruction involves the recognition of community practices and knowledge as being central to the scientific endeavor. ● Diversity in STEM: Nova: Secret Life of Scientist and Engineers) ● Peter-Delfyett: 2020 winner of Streifer Scientific Achievement) ● Impact News Here you will find the latest topical and news stories in the world of science. ● Helping Communities! ● Science News & Science News for students ● Copper-Projects-in-Latin-America: Mysterious oil spill threatens marine biodiversity haven in Brazil ● 8 projects bringing safe, sustainable water sources to communities around the world ● Sambhar Salt Lake ● Girls in STEM	**Awareness of Self & Others: My Creative Strengths** Self-knowledge is the ability to understand one's own interests, feelings, weaknesses, and strengths, as well as learning and relating styles. Self-knowledge is the starting point for all social and emotional learning. In fact, self-knowledge influences all areas of SEL including self-management, social awareness, relationship skills, and responsible decision-making. **Self-knowledge** helps students to know when they are on the right path and are making decisions that are aligned with who they are. It also can serve as a guide when students are going against their own strengths, styles, personalities, and purpose and help students re-align with who they are. The more a student understands him or herself, the better he or she will grow and adapt in all areas of life. **Self-Management:**Focus First! -Students will identify distractions and advocate for themselves in order to focus better in class. **Self-Management:**If at First You Don't Succeed... Students will practice strategies for persistence. **Self-Management:** Reach Your Goal-Students will identify a personal goal and the steps to achieve it. **Self-Management:** You Can Change It! Students will learn strategies for changing feelings, thoughts, and behaviors in stressful situations. **Self-Care:** I Believe in Me! Students will develop strategies for building belief to reach a goal**.** Self-efficacy is the belief in oneself. A student's self-efficacy greatly influences his or her academic

	motivation, learning, and achievement. Therefore, it is imperative that teachers address students' self-efficacy. Going-beyond-how-are-you-feeling This article focuses on: When students have the language to describe their feelings and needs, they are better equipped to help themselves and each other. Edutopia.org-Article/helping-students-process-their-feelings-during-remote-learning Why is it Important to Accept Others?

Lesson 1:	Properties of Matter: Describe Matter	Estimated Time:

Brief Overview of Lesson:
The focus of this lesson is on the different kinds of matter and how they can be classified using their properties. Students will investigate the properties of matter by measuring it and using their senses to describe and classify it.
What students should know and be able to do to engage in this lesson:

- Students will be given an image of fruit bars lying on the sidewalk, students will analyze the image by questioning the phenomena that is occurring in the picture.
- Students will be able to describe the states of matter they observe in the video of the hot air balloon by questioning the phenomenon that is occurring and also making a career connection.
- Students will be able to discuss the various items they were able to find by comparing their data about the given examples of tangible objects in the classroom.
- Students will read the Science Paired Read Aloud while defining the vocabulary words by identifying the vocabulary words in the text.
- After reading Science Paired Read Aloud, students will be able to identify how everything around us that takes up space is matter by completing comprehension questions and drawing three examples of each state of matter.
- Students will engage in a Scavenger Hunt and sort items by their properties by itemizing their finding in a graphic organizer and graphing their results.
- Students will read *"What is Matter?*" Science File to learn about examples of matter and some properties of matter and identify the properties of matter by referring back to the text.
- Students will compare objects by using a pan balance and comparing objects based on mass and other properties and listing the properties in a chart.
- Students will use the sense of touch to describe matter by carrying out an investigation to describe the properties of the objects.
- Students will share their observations from the activity What's in the Bag? by answering the essential question.

LESSON FOUNDATION	
Assessed Standards for this lesson	**Important content not included in the standards**
PS1.A: Structure and Properties of Matter • Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1) • Different properties are suited to different purposes. (2- PS1-2),(2-PS1-3)	***Preschool science standards: Standard 5.2: Children observe and investigate matter and energy.*** Observe, manipulate, sort, and describe objects and materials (e.g., water, sand, clay, paint, glue, various types of blocks, collections of objects, simple household items that can be taken apart, or objects made of wood, metal, or cloth) in the classroom and

• A great variety of objects can be built up from a small set of pieces. (2-PS1-3)	outdoor environment based on size, shape, color, texture, and weight.

Focus Question for this Lesson

- How do we describe matter?

Learning Intention	**Success Criteria**
Day 1: • I am learning that matter is the substance that all things are made of. • I am learning to ask questions about the phenomenon. • I am learning about Aerospace Engineers. Days 2&3: • I am learning that matter can be solids, liquids, and gases. • I am learning that matter takes up space. Days 4-7: • I am learning that it is important to utilize the following vocabulary (matter, property, mass, solid, liquid and gas) when explaining properties of matter. • I am learning that matter is all around. • I am learning about the properties of matter. Day 8: • I am learning about the mass of matter. Days 9&10: • I am learning to describe matter.	Day 1: • I can share my written explanation based on the probe with my teammates. • I can discuss my questions about the phenomenon with my classmates. • I can share my wonderings about the role of an aerospace engineer with my teammates. Days 2&3: • I am learning that matter can be solids, liquids, and gases. • I am learning that matter takes up space. Days 4-7: • I am learning that it is important to utilize the following vocabulary (matter, property, mass, solid, liquid and gas) when explaining properties of matter. • I am learning that matter is all around. • I am learning about the properties of matter. Day 8: • I am learning about the mass of matter. Days 9&10: • I can make predictions about matter. • I can measure and compare objects' mass. • I can discuss my findings with my classmates.

Assessment(s)

Self-Assessment/Peer Assessment/Teacher Assessment
Lesson 1:

- Page Keeley Probe: What is Matter?
- What's in the Bag? Performance Task
- What's in the Bag? Rubric
- Properties of Matter: eAssessments

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Students may not understand that all things on Earth are matter. Gases, in particular, might be hard for students to recognize as matter. Blowing up balloons can help students visualize gases as taking up space. As students add air (gases) to a balloon, they should observe a change in the shape of the balloon. Encourage students who are visually impaired to place both hands around the center of the balloon as it is being inflated so that they can experience the change in volume.
- Students may also think that when things melt or freeze, they become new substances. Point out that the composition of matter does not change when it melts or freezes; water is still water, whether it is ice or liquid.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://wida.wisc.edu/teach/can-do/descriptors*

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions.
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level.
- Encourage creativity and original thinking.
- Provide opportunities to make claims. (CER)
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios
  - Student Driven Instruction

THE LESSON IN ACTION: Lesson 1- Day

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Engage: How will you access students' prior knowledge? How will you capture students' interest and get students' minds focused on the concept/topic? Strategy: Conduct paired conversations, provide simple hands-on experiments, allow students to draw ideas instead of writing.

Module Opener, Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practices, Inquiry Activity

- **Engagement Strategies:Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question **Claim Evidence Reasoning** **(Evidence Based Writing)** with students as needed.
- Introduce the module by showing students the photo of the fruit bars melting in the Sun. Ask students what questions they have about the phenomenon. Allow students time to turn and talk. Have them record their questions in their science ***notebook***. Use the questions below to elicit student responses.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk. Wait Time*

- What is happening in the photo?
- What do you notice about the fruit bars?

Help students turn their observations from the photo into questions that they can refer to during the module. Let students know that they do not need to be able to answer the questions that they generate now. You may wish to brainstorm questions as a class.

During the Lesson

Key Vocabulary

Point out the Key Vocabulary

float, gas, liquid, mass, materials, matter, pattern, property, sink, solid, volume

STEM Career Connection:

Carpenter

Introduce Career Kid Chloe, who wants to be a carpenter when she grows up. She loves to design and build things. Read aloud to students what Chloe says. You may wish to have students drag a finger across the words as you read what is in the box aloud with them. Have students complete tasks in their science notebook

Science and Engineering Practices:

I will *analyze and interpret data.*

I will *carry out an investigation.*

I will *plan an investigation*

Have students read the "I will …" statements in their science notebook...

If this is the first time you are teaching these science and engineering practices, then help students understand that when scientists analyze and interpret data, they look for patterns in the data and tell how the data are alike and different. Data could be measurements or observations

Phenomenon: Science often begins when someone makes an observation about a situation or occurrence. Scientists refer to an event or situation that is observed or can be studied as a phenomenon. Spark your students' curiosity about the world by introducing the lesson phenomenon of hot air balloons.

Play the video and ask students what questions they have about the hot air balloons and have them record them in their science notebook. If students are having trouble generating their own questions, then use the questions below to help guide a class discussion and get students thinking about what they saw and what they will learn in the lesson.

ASK: *Utilize Think, Pair and Share, Turn and Talk, Accountable Talk, Wait Time*

- What did you see in the video?
- What did you notice about the hot air balloons?
- What did you wonder about what you saw in the video?
- What interests you about hot air balloons?

Assess Lesson Readiness:

Page Keeley Science Probe

What is Matter?

Probe Strategies: Sticky Bar- Commit and Toss-Gallery Walk- Four Corner- Card Sort

This probe can be used as an elicitation prior to introducing a lesson. The probe is used in a talk format. It can be used for pair talk,

small-group talk, whole class discussion, or a combination of talk configurations. Introduce the probe by showing a picture of ice

cubes, and the comments made by students. Have the students discuss which of the comments they agree with and why. Choose a
talk configuration (pair, small group, whole class, or combination) and listen carefully as students share their thinking. Students will explain their choice using the Claim Evidence Reasoning graphic organizer.

Create charts utilizing the essential question, phenomenon and Page Keeley probe:

● Essential Question Chart must include students' questions and wondering about the EQ.
● Phenomenon Chart must include an image of the phenomenon and student' questions and comments.
● Page Keeley Probe chart must include an image of the probe along with the students' response. Students will revisit the probe later in
the lesson to update their responses.

STEM Career Connection:

Aerospace Engineer

Introduce Career Kid Emily, who wants to be an aerospace engineer when she grows up. She's always been fascinated with how things fly.

ASK:*Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.****Wait Time***

- Why might Emily be interested in hot air balloons?
- What does being an aerospace engineer have to do with matter?

Essential Question:

How do we describe matter?

Have students read the Essential Question. Have them use prior knowledge and observations to try to answer the question. Remind students that they are not expected to know the answer to this question right now, but throughout the lesson they will learn more and be able to apply what they have learned to add to and revise their answer at the end of the lesson. You might want to record students' thoughts and questions about the Essential Question by using chart paper.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do we describe matter?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION:Lesson 1: Days 2&3

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explore: *What hands-on/minds-on common experience(s) will you provide for students?*

- *Strategies: Assign group roles for investigation, allow students to create demonstrations or models, create visual models to support each step of the investigation.*

Inquiry Activity and What's the Matter

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**

➢ **Implement: Work Stations-Maker Space-Choice Boards**

- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Inquiry Activity:

Scavenger Hunt

Purpose Students will observe a number of examples of solids, liquids, and gases in their classroom.

What to Expect: Students will collect items they find around the classroom and classify the items as solid, liquid, or gas based on observed properties. Students will find mostly solid items.

Advanced Preparation While solids are quite common in a classroom; liquids are less so. Thus, be sure to have available in plain sight some common liquids, such as water, juice, tea, and coffee.

Point out that students just saw a video of hot air balloons. Hot air balloons are composed of different materials and states of matter. Now students will explore what states of matter are around them in the classroom.

Read the steps of the investigation

Make a Prediction Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions in their science notebook. Then have students explain their predictions based on previous observations.

During the Lesson

Carry Out an Investigation

- Help students find a variety of different items. For example, do not have them pick eight pencils. Also, encourage students to search in different parts of the classroom so that they are not crowded into one area, finding the same items.

Have students complete the questions in their science notebook.

Talk About It:

Have students share their observations and data with their classmates.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did your results compare with those of your classmates?
- What is the most common type of matter in the classroom? Is this what you predicted?

During the discussion, students should not only analyze their data, but also describe how they collected the data by describing how they made observations.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did you observe the items around the classroom? What senses did you use? Give an example.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do we describe matter?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

<u>Online Learning Activities:</u>

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following-

Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.

- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

The Lesson In Action:Lesson 1: Days 4&5

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explain: *How will you help students connect their exploration to the concept/topic under investigation?*

- Strategies: Provide varied reading materials, utilize small group instruction, provide additional reading strategies and explanation of text.

Obtain and Communicate Information, Reflect and Refine & Science and Engineering Practices.

- **Engagement Strategies:Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Read the vocabulary words listed aloud. Have students circle vocabulary words that they have heard before. You might want to have students add the words to a word wall so they can reference them as they move through the lesson. Explain to students that they will see the words used in the content that they will be learning.

matter anything that takes up space and has mass
property the look, feel, smell, sound, or taste of a thing
mass the amount of matter in an object
solid a state of matter that has a shape of its own
liquid matter that takes the shape of the container it is in
gas state of matter that does not have its own shape

Students should have encountered the following word in their previous learning: *classify*. Make sure students understand what this word means before continuing in the lesson.

- Vocabulary development strategies: Graphic
  - Word Splash
  - Frayer Model
  - Word Art
  - Interactive Read and Act

During the Lesson

Have students complete the questions in their science notebook.

Develop Vocabulary:

matter Display common objects. Show students how the objects cannot occupy the same space at the same time.

property Ask students if they know of another everyday meaning of the word *property*. ("piece of land") Discuss how this meaning is different from the meaning in science, which is "the look, feel, smell, sound, or taste of a thing." The meaning in science concerns using our senses to describe something.

mass Students may confuse *mass* with size. Show a small object of heavy mass, such as a ball bearing, and a large object of light mass, such as a beach ball.

Visual Kinesthetic Vocabulary:

Have students cut out and fill in the Dinah Zike Visual Kinesthetic Vocabulary from pages VKV293-VKV294 Tell students that solid, liquid, and gas are all states of matter. The VKV helps them distinguish among the three.

Have students make a folded book Foldables.

Pair up students, and have them make a Three-Tab Book. Have one student write *Solid* on the left tab, *Liquid* on the middle tab, and *Gas* on the right tab. Then have students draw an example of each type of matter under the appropriate tab. Encourage students to write words or phrases to describe their drawings.

See the Foldables study guides for more information on Foldables.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do we describe matter?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?

- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION:Lesson 1: Days 6&7

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explain: *How will you help students connect their exploration to the concept/topic under investigation?*

- Strategies: Provide varied reading materials, utilize small group instruction, provide additional reading strategies and explanation of text.

Obtain and Communicate Information, Reflect and Refine & Science and Engineering Practices.

- **Engagement Strategies:Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Inquiry Activity:
Classifying Matter
Purpose: Students will classify matter from the Scavenger Hunt.
What to Expect: Students will list four properties of matter and then sort the objects they found in the Scavenger Hunt activity into these properties.
Read the steps of the investigation.

Carry Out an Investigation

- Help students brainstorm different properties of matter, such as color, size, shape, and texture. Encourage students to consider the items from the Scavenger Hunt activity as they think of different properties and write them in the chart. As students sort the items into the four categories of the chart, remind them that the key to sorting items is careful observations of the similarities and differences among the items.

Talk About It:

Have students share their observations with their classmates.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How do your results compare with those of your classmates?
- What was one property that you had in common with a classmate? What kinds of items did you and your classmate place under that property?

During the Lesson

Once students have categorized their objects, have them make a bar graph to more easily display patterns of their objects' properties. Explain to students that a bar graph is useful for comparing data, such as the number of objects, in various categories. In a bar graph, the horizontal axis might indicate color, and the vertical axis might indicate the number of objects of each color. Have students draw their graph in their science notebook.

- Which property in your graph had the highest bar? What does that mean?
- How does this compare to your classmates' graphs?
- Why is it helpful to show your data in the form of a bar graph?

Crosscutting Concepts- Patterns:

If this is the first time you have taught the **Crosscutting Concept** of patterns, help students understand that patterns occur in the natural and human-made world. Students might recognize patterns in the way they sorted objects around the classroom by property.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What patterns did your data show?

Talk About It:

Use the Talk About It question to assess students' understanding of what they have learned so far. If students do not demonstrate understanding about the different states of matter, then have them revisit some activities in this lesson.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What are the different ways that you classified matter?

What is Matter?

Have students read *What is Matter?* Science File to learn about examples of matter and some properties of matter. While reading, students will encounter the vocabulary words: *matter*, *mass*, and *property*.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What can we use to compare the mass of two objects? We can use a tool called a pan balance. We can place an item on each side of the balance and see which one is higher and which one is lower. The higher one has less mass.
- What are some ways you can describe matter?

Use the Visuals Have students look at the bottom photo on the first page of the Science File. It shows a pan balance with a loaf of bread on one side and a slice of bread on the other side.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Which is lower in the photo, the loaf of bread or the slice of bread?
- What does this mean?
- Does this result make sense? Why?

Have students complete the questions.

Check-in:

Use this opportunity to do a quick assessment to determine if students are ready to move on.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- **Classify** What are some different ways you can sort and classify matter?

Complete the graphic organizer as a class. If students were not able to describe different ways to sort and classify matter, then have them reread *Matter Is All Around* Us in the ***Science Paired Read Aloud***. Students should be able to describe how to sort and classify matter based on its state of matter and other properties.

Reflect and Refine:

What is Matter?

At this point, students can go back to the Page Keeley Science Probe to decide whether they would like to change or justify their response. Students have had an opportunity to develop a conceptual understanding of matter. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

Science and Engineering Practices:

I can *analyze data.*

Have students complete the "I can …" statement. The "I can …" statement for this lesson references the **Science and Engineering Practice** of analyzing data.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What data did you collect during the Scavenger Hunt?
- How did you analyze the data?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do we describe matter?**

- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
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THE LESSON IN ACTION: Lesson 1: Day 8

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Elaborate: *How will students apply their learning and develop a more sophisticated understanding of the concept/topic?*

- Strategies: Allow choice for activities that provide varying levels of complexity and hands-on opportunities, allow students to respond with labeled pictures and illustrations.

Obtain and Communicate Information, Reflect and Refine & Science and Engineering Practices.

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an**

opportunity for all students to be successful at the start of the lesson. Do Now TIPS

- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Inquiry Activity:
Finding the Mass of Matter
Purpose: Students will use a pan balance and compare objects based on mass and other properties.
What to Expect: Students will measure the mass of two different classroom objects with a pan balance. Then they will compare the masses of the two objects and compare other properties of the objects.
Read the steps of the investigation **together** with students.
Advanced Preparation: If there are not enough pan balances available for all groups, this activity may be conducted as a demonstration instead. Gather two objects of significantly different masses, and set up the other materials ahead of time. You may wish to draw the data chart on the board and fill it in as you demonstrate.
Make a Prediction: Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions in their science notebook**.** Then have students explain their predictions based on previous observations.

During the Lesson

Carry Out an Investigation

- Check students' objects. Be sure that the pair of objects each group of students chooses is significantly different in mass.
- **Record Data:** If necessary, remind students how to use a pan balance and gram cubes. You may wish to demonstrate their use before students begin. Be sure that students have the two pans as level as possible before counting the number of gram cubes. On a separate piece of paper, have students draw a two-column table in which to record their data. Have students label the first column *Object* and the second column *Mass (g)*. Students will need two rows below these labels, one for each object. When students have filled in their data tables.

Talk About It:
Have students share their observations from the activity ***Finding the Mass of Matter.***
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did your results compare to your classmates' results?
- Does the result support your prediction?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do we describe matter?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?

- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

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THE LESSON IN ACTION: Lesson 1: Days 9 &10

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

- **Evaluate:** *How will students demonstrate their mastery of the learning objective(s)?*
  - *Strategies: Utilize choice boards, make assessment accommodations, modify test items*

Performance Task: What's in the Bag?- Essential Question Reflections: *How do we describe matter?*

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Performance Task:
What's in the Bag?
Purpose Students: will use the sense of touch to describe matter.

What to Expect: Students will reach into different bags and describe and identify the item within by using their sense of touch only. They will repeat the procedure for several bags.

Advanced Preparation: Prepare about four or five bags for each group, each bag with one item in it. Be sure students do not see what's in the bags, as they will have to identify the items during the investigation. Use opaque bags, such as brown paper bags. Choose items of different textures, shapes, and thicknesses so that the items are distinguishable and identifiable to students. Possible items may include chalk, eraser, marble, unsharpened pencil, and sponge. Clearly number each bag with a marker.

Read the steps of the investigation together with students.

Make a Prediction: Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions in their science notebook. Then have students explain their predictions based on previous observations.

During the Lesson

Carry Out an Investigation

- Remind students not to look inside the bag or pull the item out of the bag.
- **Record Data** Students may describe the texture, shape, thickness, length, or other property of the items inside the bag. Note that students should describe the items in the table for this step. They will identify the actual item in a later step in the investigation. Have students record their data in their science notebook.

DAY 10

Talk About It

Have students share their observations from the activity What's in the Bag?

ASK:*Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did your results compare to your classmates' results?
- How were your classmates able to identify the items? How did their responses compare to the way you were able to identify the items?

Essential Question:

How do we describe matter?

Have students refer to the answers you recorded to this question at the beginning of the lesson and see if and how their thinking has changed. Discuss and share their answers as a large group. Have students answer the Essential Question in their science notebook.

Science and Engineering Practices:

I did *analyze data.*

Have the students refer to the "I will …" and "I can …" statements.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How would you rate your ability to analyze data? Color in the number of stars that tell how well you did.

eAssessment:

You might want to assign students the lesson test from eAssessment. You can assign the premade lesson test, which is based on the **Disciplinary Core Ideas** for the lesson, or you can customize a test using the customization tool. For additional help with eAssessment, please reference the "How To" guide under Assessment in the main menu.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do we describe matter?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
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Online Learning Activities:

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Lesson 1 Resources

- Be a Scientist Notebook Pages 2-3
- Be a Scientist Notebook Page 5

- Be a Scientist Notebook Page 6
- Be a Scientist Notebook Pages 8-9
- Science File: *What is Matter?*
- Be a Scientist Notebook Page 10
- Be a Scientist Notebook Pages 11-12
- Be a Scientist Notebook Pages 13-14

Lesson 2:	**Properties of Matter: Solids**	**Estimated Time: 9 days**

Brief Overview of Lesson: The focus of this lesson is to identify solids and describe their properties. Matter can exist as a solid and has certain properties that make it useful. Students will plan an investigation to determine if an object is solid or not.

What students should know and be able to do to engage in this lesson:

- Students will share their observations from the activity Plan an Investigation about Solids by explaining their findings.
- Students will make oobleck and test its properties by documenting their findings.
- Students will read the *Science Read Aloud* learning how solids can be described by observable properties, identify vocabulary words and answer comprehension questions of the text.
- Students will learn about natural solids by engaging in the Science Read Aloud.
- Students will test objects to determine if they are solid by collecting data on their investigation.
- Students will read *What is a Solid?* Science File and identify words that describe a solid by using the information presented in the text.
- Students will measure and compare two different solids by engaging in an investigation and collecting data.
- Students will plan an investigation about solids by writing the steps of the investigation.
- Students will share their observations from the investigation *Plan an Investigation about Solids* by comparing with the class.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
PS1.A: Structure and Properties of Matter Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1) • Different properties are suited to different purposes. (2-PS1-2)	***Preschool science standards: Standard 5.2: Children observe and investigate matter and energy.*** Observe, manipulate, sort, and describe objects and materials (e.g., water, sand, clay, paint, glue, various types of blocks, collections of objects, simple household items that can be taken apart, or objects made of wood, metal, or cloth) in the classroom and outdoor environment based on size, shape, color, texture, and weigh

Focus Question for this Lesson
What are the properties of solids?

Learning Intention	Success Criteria
Day 1: ● I am learning that matter can be solid. ● I am learning to ask questions about the phenomenon. ● I am learning about Aerospace Engineers. Days 2&3: ● I am learning that matter can be solids, liquids, and gases. ● I am learning that matter takes up space. Days 4-7: ● I am learning that it is important to utilize the following vocabulary ● I am learning about natural solids. ● I am learning about the properties of solids. Day 8: ● I am learning that solids can be described by listing the materials they are made of, their, and their mass. Days 9&10: ● I am learning about the properties of solids.	Day 1: ● I can share my written explanation based on the probe with my teammates. ● I can discuss my questions about the phenomenon with my classmates. ● I can explain why an Aerospace Engineer might be interested in matter. Days 2&3: ● I can make a material using water and cornstarch. ● I can describe why oobleck is like a solid. ● I can share my observations from the investigation with my classmates. Days 4-7: ● I can test objects to determine if they are solids. ● I can explain why some materials are used to make solids. ● I can explore patterns in nature and in human-made objects. ● I can complete a vocabulary concept map. ● I can reflect and revise my response to Page Keeley Science Probe: Is it a Solid? Day 8: I can use a ruler to measure different solids. I can record the measurements on a table. I can compare my measurements to my classmates' measurements. Days 9&10: ● I can plan an investigation. ● I can write down the steps involved in my investigation. ● I can share my observation from the activity with my teammates. ● I can discuss and share how my thinking has changed about the *EQ:What are the properties of solids?* ● I can demonstrate my learning by completing lesson two assessment
Assessment(s)	

Self-Assessment/Peer Assessment/Teacher Assessment
Lesson 2:

- Page Keeley Science Probe:
  - Is it a Solid?
- Performance Task: Plan an Investigation About Solids
  - Plan an Investigation about Solids Rubric
- Properties of Matter: eAssessments

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring:Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

Possible Preconceptions/Misconceptions:

- Students may not know that an object is still considered a solid if it contains air. For example, a balloon is a solid, even though the air inside it is a gas.
- Students may believe that larger solids are always heavier (for example, assuming a large empty cardboard box is heavier than a small iron bar). Provide examples of solids of the same size, but of different weights, for students to compare.
- Students may also hold the misconception that all solids are hard and inflexible. Provide materials that students can stretch or form into different shapes, such as elastic bands or clay.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://wida.wisc.edu/teach/can-do/descriptors*

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions

- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level.
- Encourage creativity and original thinking.
- Provide opportunities to make claims. (CER)
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios
  - Student Driven Instruction

THE LESSON IN ACTION: Lesson 2: Day 1

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Lesson 2: Solids

- **Engage:** *How will you access students' prior knowledge? How will you capture students' interest and get students' minds focused on the concept/topic? Strategy: Conduct paired conversations, provide simple hands-on experiments, allow students to draw ideas instead of writing.*

Module Opener, Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

Create charts utilizing the essential question, phenomenon and Page Keeley probe:

- Essential question chart must include students' questions and wondering about the EQ.
- Phenomenon chart must include an image of the phenomenon and students' questions and comments.
- Page Keeley Probe chart must include an image of the probe along with the student's response. Students will revisit the probe later in the lesson to update their responses.

Assess Lesson Readiness:
Page Keeley Science Probe
Probe Strategies: *Sticky Bar- Commit and Toss-Gallery Walk- Four Corner- Card Sort*

Is it Solid?
Purpose: This probe is intended to uncover students' basic ideas about solids. Use this probe to assess prior knowledge and uncover misconceptions that will drive lesson instruction. Do not give students the answer. Students will return to the probe after completing the lesson to see how their thinking has changed.
Using the Probe:
Use this probe prior to introducing a lesson on solids. This justified list probe is used in a talk format. It can be used for pair talk, small-group talk, whole-class discussion, or a combination of talk configurations. It can be given as a worksheet in which students circle their answers, be projected on a screen or wall, or be used on an easel chart, or each of the answer choices can be printed on cards and used as a card sort.
Start by telling students that scientists group matter as solids, liquids, or gases. Ask students what they think solid matter is. Let students share their initial ideas without acknowledging whether they are right or wrong. Provide time for them to surface and talk about their initial ideas.
Then introduce the probe. Choose a talk configuration (pair, small group, whole class, or combination), and listen carefully as students share their thinking about which things on the list are examples of solids. Use talk moves to help them explain their thinking about the properties they used to decide if something is or is not a solid.

During the Lesson

Phenomenon: Science often begins when someone makes an observation about a situation or occurrence. Scientists refer to an event or situation that is observed or can be studied as a phenomenon. Spark your students' curiosity about the world by introducing the lesson phenomenon of oobleck.
Show the photo and ask students what questions they have about oobleck and have them record them in their science notebook. If students are having trouble generating their own questions, then use the questions below to help guide a class discussion and get students thinking about what they saw and what they will learn in the lesson.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What did you see in the photo?
- What did you notice about oobleck?
- What did you wonder about what you saw in the photo?
- What interests you about oobleck?

Help students turn their observations from the photo into questions that they can refer to during the lesson. Tell students that they do not need to be able to answer the questions that they generate right now. They will return to them later in the lesson.
STEM Career Connection:

Aerospace Engineer
Introduce Career Kid Emily, who wants to be an aerospace engineer when she grows up.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Why might Emily be interested in oobleck and solids?

Essential Question:
What are the properties of solids?
Have students read the Essential Question. Have them use prior knowledge and observations to try to answer the question. Remind students that they are not expected to know the answer to this question right now, but throughout the lesson they will learn more and be able to apply what they have learned to add to and revise their answer at the end of the lesson. You might want to record students' thoughts and questions about the Essential Question by using chart paper or the white board so they can reference them throughout the lesson.
Science and Engineering Practices:
I will *carry out an investigation.*
I will *plan an investigation.*
Have students read the "I will …" statement. Throughout the lesson, students will carry out and plan investigations. If this is the first time you are teaching the **Science and Engineering Practice** of planning and carrying out an investigation, then inform students that scientists carry out investigations to learn about the world and answer questions. Explain that, in an investigation, scientists carry out such steps as asking a question, collecting and analyzing data, and making a conclusion.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How could you figure out what oobleck is?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What are the properties of solids?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria.

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

<u>Online Learning Activities:</u>

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source

of motivation while providing instant feedback regarding their understanding of the material.

- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION:Lesson 2: Days 2&3

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explore: *What hands-on/minds-on common experience(s) will you provide for students?*

- *Strategies: Assign group roles for investigation, allow students to create demonstrations or models, create visual models to support each step of the investigation.*

Inquiry Activity-*Oobleck* & Irene's Exploration

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

Inquiry Activity: Oobleck

Purpose: Students will make a material and test its properties.
What to Expect: Students will make a material called oobleck and perform actions on it to determine if it's solid. Students will see that it is a difficult material to classify since oobleck sometimes behaves like a solid, and other times it behaves like a liquid.
Point out that students just saw a photo of green oobleck in the Science in My World. Now they will make oobleck and test its properties.
Read the steps of the investigation.
Make a Prediction Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions in their science notebook. Then have students explain their predictions based on previous observations.

During the Lesson

Carry Out an Investigation

- Premeasure the correct amount of water in each bowl for students. Have paper towels available in case of spills.
- Advise students to add the cornstarch a little at a time and to stir the mixture carefully after each addition.

- **Record Data** Allow students to manipulate the oobleck they created and then brainstorm different actions they could perform on it. For example, students could roll it into a ball and try to bounce it like a ball. Have students record the actions they will make and their data in their science notebook.

Have students complete the questions in their science notebook.

Talk About It:

Have students share their observations and data with their classmates.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How do your results compare to those of your classmates?
- Is oobleck a solid? What do your classmates think?

Students should use what they learned in the previous lesson to describe oobleck. Encourage them to clearly articulate different states and properties of matter.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- In what way is oobleck like a liquid?

DAY 3

Irene's Exploration:

Have students read pages 4–13 in the ***Science Paired Read Aloud***. Students will learn how solids can be described by observable properties, such as size, shape, color, and mass.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Where does Irene live?
- What does Irene discover from the other animals about the kickball and bowling ball?
- What are a few things that Irene finds while she explores Jonah's room with the other animals?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What are the properties of solids?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria.

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain.

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
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of motivation while providing instant feedback regarding their understanding of the material.

- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION: Lesson 2: Days 4&5

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explain: *How will you help students connect their exploration to the concept/topic under investigation?*

- Strategies: Provide varied reading materials, utilize small group instruction, provide additional reading strategies and explanation of text.

Obtain and Communicate Information, Reflect and Refine & Science and Engineering Practices

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Obtain and Communicate Information:

Vocabulary development strategies: Graphic

- Word Splash
- Frayer Model
- Word Art
- Interactive Read and Act

Read the vocabulary word listed aloud. Have students circle the vocabulary word if they have heard it before. Using the teacher presentation slide, display the word and its definition. You might want to have students add the word to a word wall so they can reference it as they move through the lesson. Explain to students that they will see the word used in the content that they will be learning.

pattern the repeated way in which something happens

Students should have encountered the following words in their previous learning: *property* and *solid*. If students need to review the words *property* and *solid*, have them look up these words in *Matter Is All Around*

Us in the ***Science Paired Read Aloud***. Make sure students understand what these words mean before continuing in the lesson.

During the Lesson

From Nature or From People:

Have students read the ***Science Paired Read Aloud***. Students will learn about natural solids that people use to make things and about human-made materials as well. They will explore patterns in nature and in human-made objects. While reading, students will encounter the vocabulary word: *pattern*.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Name a natural solid and one object made from this solid.
- Is a plastic building block a natural or human-made solid?
- Why do people create patterns when making things?

Have students complete the questions in their science notebook.

Crosscutting Concepts- Patterns:

If this is the first time you have taught the **Crosscutting Concept** of patterns, help students understand that scientists observe patterns in natural and human-made environments. Students might have observed a pattern in their environment.

Inquiry Activity:

Identifying Solids

Purpose Students will test objects to determine if they are solid.

What to Expect: Students will select several objects in the classroom and perform certain actions of their choosing on the objects. Based on these results, students will determine if the objects are solids. Most of their results will show the objects are in fact solid.

Read the steps of the investigation in their science notebook together with students.

Ask a Question Help students ask a question that they will answer in the investigation. Remind them that asking questions is a science practice that drives every investigation. Tell them to write their question in their ***science notebook***. Then have students explain how their question will be answered in the investigation.

Carry Out an Investigation

- Encourage students to choose objects with different properties. For instance, don't have them choose only hard, smooth objects.
- Help students brainstorm different actions they could perform on the objects. You may wish to have students run their ideas past you for approval. They should be actions that are safe and easy to do. Some options for actions could be bending, twisting, and squeezing.
- **Record Data** Have students record their data.

Talk About It:

Have students share their observations and data with their classmates.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did your results compare to your classmates' results?

Crosscutting Concepts- Patterns:

Help students understand the **Crosscutting Concept** of patterns. Tell students that scientists can use patterns to describe phenomena. To find a pattern, you can look at what is the same or what repeats in a phenomenon.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What patterns do you observe in a new box of crayons?

Talk About It:

Use the Talk About It question to assess students' understanding of what they have learned so far. If students do not demonstrate understanding about what a solid is, then have them revisit some activities in this lesson.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How is a solid object different from an object that is not solid?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What are the properties of solids?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
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- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION: Lesson 2: Days 6&7

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explain: *How will you help students connect their exploration to the concept/topic under investigation?*

- Strategies: Provide varied reading materials, utilize small group instruction, provide additional reading strategies and explanation of text.

Obtain and Communicate Information, Reflect and Refine & Science and Engineering Practices

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

What is a Solid? Science File:

Have students read *What is a Solid?* Science File to learn more about the many properties of solids.

- How are all solids alike?
- How can you measure the length of a solid?

Use the Visuals Have students look at the four photos on the first page of the Science File. Have students study the photos and the captions and think about how the objects are alike and different.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.**Wait Time***

- Which objects are breakable?
- How are the sponge and the ball different?
- Which object is both red and breakable?

During the Lesson

Quick Check:
Use this opportunity to do a quick assessment to determine if students are ready to move on. Display the Quick Check slide from the teacher presentation and
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.**Wait Time***

- **Main Idea and Details** What are some properties of a solid?

Complete the graphic organizer as a class. If students were not able to describe some properties of solids, then have them reread the *What is a Solid?* Science File. Have them observe the objects pictured in the file and read the captions.
Reflect and Refine:
Is it Solid?
At this point, students can go back to the Page Keeley Science Probe in their science ***notebook*** to decide whether they would like to change or justify their response. Students have had an opportunity to develop a conceptual understanding of oobleck. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.
Science and Engineering Practices:
I can *carry out an investigation.*
I can *plan an investigation.*
Have students complete the "I can …" statements for this lesson reference the **Science and Engineering Practice** of planning and carrying out an investigation.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.**Wait Time***

- What investigation did you carry out?
- What investigation did you plan?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What are the properties of solids?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
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THE LESSON IN ACTION:Lesson 2: Days 7

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Elaborate: *How will students apply their learning and develop a more sophisticated understanding of the concept/topic?*

- Strategies: Allow choice for activities that provide varying levels of complexity and hands-on opportunities, allow students to respond with labeled pictures and illustrations.

Research, Investigate, and Communicate
Inquiry Activity- Measuring Solids

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**

- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Inquiry Activity- Measuring Solids
Purpose: Students will measure and compare two different solids.
What to Expect: Students will measure the length, width, and mass of a book and a crayon and compare their data. All of the measurements of the book will be greater than those of the crayon.
Read the steps of the investigation together with students.
Ask a Question: Help students ask a question that they will answer in the investigation. Remind them that asking questions is a science practice that drives every investigation. Tell them to write their question in their science notebook.

During the Lesson

Carry Out an Investigation

- If necessary, demonstrate for students how to use a ruler to measure the book and the crayon. Be sure students are consistent with which dimension of an object is its length and which is its width.
- **Record Data:** Be sure students use the correct units for length and width (centimeters) and for mass (grams). Have students record their data in their science notebook.
- Have students answer the questions in their science notebook.

Talk About It:
Have students share their observations from the activity Measuring Solids.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.**Wait Time***

- How did your measurements compare to your classmates' measurements?
- Which object was longer and wider? Did your classmates get the same results?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What are the properties of solids?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities

that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.

- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
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- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION:Lesson 2: Days 8&9

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

- **Evaluate:** *How will students demonstrate their mastery of the learning objective(s)?*
  - *Strategies: Utilize choice boards, make assessment accommodations, modify test items*

Performance Task: Plan an Investigation about Solids. Essential Question Reflections: *What are the properties of solids?*

Plan an Investigation about Solids

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science:** **Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson.** **Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Purpose: Students will plan an investigation.
What to Expect Students will write out the steps they would take to find out if a mystery object is solid or not. They should use what they learned in the lesson to develop the steps.
Read the steps of the investigation together with students.
Ask a Question Help students ask a question they will answer in the investigation. Remind them that asking questions is a science practice that drives every investigation. Tell them to write their questions in their science notebook.

During the Lesson

Carry Out an Investigation

- Brainstorm with students how they could go about determining the steps needed to find out if an object is a solid. Guide students to see how the activities in the lesson helped them build up to this point. For example, students may realize that they can manipulate or perform actions on the object to find out if

it's solid. They did so previously with oobleck and other classroom objects. They may also wish to take measurements, such as length or mass. Encourage students to include using their senses and identifying properties as part of their procedure.

Remind students that an important step in any investigation is to record their data. Help them to determine the kind of data that they should record and how to record them neatly in a table. Again, refer back to the previous activities in the lesson to guide students.

DAY 9

Talk About It:

Have students share their observations from the activity Plan an Investigation about Solids.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did the steps you wrote for the investigation compare with the steps your classmates wrote?

Essential Question:

What are the properties of solids?

Have students refer to the answers you recorded to this question at the beginning of the lesson and see if and how their thinking has changed. Discuss and share their answers as a large group. Have students answer the Essential Question in their science notebook.

Science and Engineering Practices:

I did *carry out an investigation.*

I did *plan an investigation.*

Have the students refer to the "I will …" and "I can …" statements.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How would you rate your ability to plan and carry out an investigation? Color in the number of stars that tell how well you did.

eAssessment:

You might want to assign students the lesson test from eAssessment. You can assign the premade lesson test, which is based on the Disciplinary Core Ideas for the lesson, or you can customize a test using the customization tool.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What are the properties of solids?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

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Lesson 2 Resources

Be a Scientist Notebook Page 17
Be a Scientist Notebook Pages 18-19
Be a Scientist Notebook Pages 22-24
Science File: *What is a Solid?*
Be a Scientist Notebook Pages 24-25
Be a Scientist Notebook Pages 26-27
Be a Scientist Notebook Pages 28-29

Lesson 3:	**Properties of Matter: Liquids and Gases**	**Estimated Time:**

Brief Overview of Lesson: The focus of this lesson is that liquids and gases are states of matter and have observable properties. The shape of liquids and gases is determined by the container in which they are found. Students will investigate how matter changes from a solid to a liquid to a gas and communicate their observations to classmates.

What students should know and be able to do to engage in this lesson:

- Students will explore the phenomenon of ice being heated and identify the phenomenon that occurs by explaining their thinking.
- Students will compare and contrast their predictions and results from the investigation of filling water in different containers by drawing conclusions from their findings.
- Students will read the *What Is a Liquid?* Science File to learn more about the properties of liquids, identify vocabulary and answer comprehension by using the information presented in the text.
- Students engage in an investigation by investigating through the *All About Gas* Digital Interactive to learn about different properties of gases.

- Students will compare and contrast liquids and gases by carrying out an investigation.
- Students will carry out an investigation on gases by carrying out an investigation.
- Students will observe water change from a solid to a liquid to a gas by collecting data throughout the day.
- Students will share their observations from the investigation *All Three States* by discussing with the class.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
PS1.A: Structure and Properties of Matter • Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1) • Different properties are suited to different purposes. (2-PS1-2)	***Preschool science standards: Standard 5.2: Children observe and investigate matter and energy.*** Observe, manipulate, sort, and describe objects and materials (e.g., water, sand, clay, paint, glue, various types of blocks, collections of objects, simple household items that can be taken apart, or objects made of wood, metal, or cloth) in the classroom and outdoor environment based on size, shape, color, texture, and weigh

Focus Question for this Lesson

What are the properties of liquids and gases?

Learning Intention	**Success Criteria**
Day 1: • I am learning about the properties of liquids and gases. • I am learning to ask questions about the phenomenon. • I am learning about Aerospace Engineers. Days 2&3: • I am learning that water has volume. Days 4-6: • I am learning that it is important to utilize the following vocabulary (volume) when explaining liquids. • I am learning the properties of liquids. • I am learning the properties of gases. Day7&8: • I am learning the properties of gas. • I am learning that water can change from a solid to a liquid to a gas.	Day 1: • I can share my written explanation based on the probe with my teammates. • I can discuss my questions about the phenomenon with my classmates. • I can wonder why an Aerospace Engineer might be interested in ice being heated. Days 2&3: • I can make a prediction about water heights in different containers. • I can compare a liquid in different containers. • I can draw containers of water at varying levels. Days 4-6: • I can list and explain different types of liquids. • I can explore the Digital Interactive *All about Gases.* • I can compare liquids and gases using a Venn diagram. • I can reflect and revise my response to Page Keeley Science Probe: Gases and Liquids.

	● I can complete a vocabulary concept map. Days 7&8: ● I can create a question to investigate. ● I can sequence the steps of an investigation. ● I can create bubbles in soapy water using air, a gas, from their lungs. ● I can explain to my classmates why it is important to carefully plan an investigation. ● I can make a prediction about what will happen to the ice cube when it is left in the Sun. ● I can share my observations with my classmates. ● I can compare my results to my classmates' results. ● I can discuss and share how my thinking has changed about the *EQ:What are the properties of liquids and gases?* ● I can demonstrate my learning by completing lesson three assessment.

Assessment(s)

Self-Assessment/Peer Assessment/Teacher Assessment

Lesson: 3

- **Page Keeley Probe:**Gases and Liquids
- All Three States Performance Task
- Performance Task: All Three States Rubric
- Properties of Matter: eAssessments
- **Claim Evidence Reasoning (Evidence Based Writing)**

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Some students may have misconceptions about changes in state. Students who select Arturo may know that water evaporates into the form of a gas, but may fail to recognize that the gas can change back into a liquid. Conversely, students who choose Maggie may recognize that gases condense to form liquids, but may fail to recognize that liquids can evaporate to form gases.
- Another misconception that may surface is that some students think that a change in state can only go in one direction. Once matter has changed state, they may fail to recognize that it can change back to its original state.

- Some students may also think that once it changes to a gas, it disappears and no longer exists. This is an indication that a student may lack conservation reasoning.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://wida.wisc.edu/teach/can-do/descriptors*

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)

- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level.
- Encourage creativity and original thinking.
- Provide opportunities to make claims. (CER)
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content

- Real world scenarios
- Student Driven Instruction

THE LESSON IN ACTION:Lesson 3: Day 1

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

- **Engage:** How will you access students' prior knowledge? How will you capture students' interest and get students' minds focused on the concept/topic? Strategy: Conduct paired conversations, provide simple hands-on experiments, allow students to draw ideas instead of writing.

Module Opener, Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

Create charts utilizing the essential question, phenomenon and Page Keeley probe:

- Essential Question Chart must include students' questions and wondering about the EQ.
- Phenomenon Chart must include an image of the phenomenon and student' questions and comments.
- Page Keeley Probe chart must include an image of the probe along with the students' response. Students will revisit the probe later in

the lesson to update their responses.

Assess Student Readiness Page Keeley Science Probe:

Gases and Liquids

Purpose: This probe is intended to uncover students' basic ideas about the change in state between liquids and gases. Use this probe to assess prior knowledge and uncover misconceptions that will drive lesson instruction. Do not give students the answer. Students will return to the probe after completing the lesson to see how their thinking has changed.

Using the Probe

Use this probe prior to introducing a lesson on the change in state between liquids and gases. This probe is used in a talk format. It can be used for pair talk, small-group talk, whole-class discussion, or a combination of talk configurations. The characters in the probe share their ideas, and students are asked to select with whom they most agree and explain why they agree. This format helps students recognize that people have different ideas about science and that it is important to share these ideas.

Introduce the probe by telling students that three friends are talking about liquids and gases. They each have a different idea about how liquids and gases can change state.

Point to each character, say the character's name, and read the character's claim. Make sure students understand what each character is saying. Then ask students to choose the friend they think has the best claim about the change in state between a liquid and a gas. Choose a talk configuration (pair, small group, whole class, or combination), and listen carefully as students share their thinking. Use talk moves to help them explain their thinking.

Throughout the Lesson

Use students' ideas to plan instruction during the module that will address their misconceptions and help them gain new knowledge and use appropriate terminology about changes in state.

During the Lesson

Science in My World: Phenomenon

Science often begins when someone makes an observation about a situation or occurrence. Scientists refer to an event or situation that is observed or can be studied as a phenomenon. Spark your students' curiosity about the world by introducing the lesson phenomenon of ice being heated.

Play the video and ask students what questions they have about the ice being heated and have them record them in their science notebook. If students are having trouble generating their own questions, then use the questions below to help guide a class discussion and get students thinking about what they saw and what they will learn in the lesson.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What did you see in the video?
- What did you notice about the ice being heated?
- What did you wonder about what you saw in the video?
- What interests you about the ice being heated?

Help students turn their observations from the video into questions that they can refer to during the lesson. Tell students that they do not need to be able to answer the questions that they generate right now. They will return to them later in the lesson.

STEM Career Kid Connection:

Aerospace Engineer

Introduce Career Kid Emily, who wants to be an aerospace engineer when she grows up. Have students read what Emily says.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Why might Emily be interested in ice being heated? Sample answer: Aerospace engineers, like all engineers, work with matter in different states, so Emily might want to know about how matter changes when it is heated.

Essential Question:

What are the properties of liquids and gases?

Have students read the Essential Question. Have them use prior knowledge and observations to try to answer the question. Remind students that they are not expected to know the answer to this question right now, but throughout the lesson they will learn more and be able to apply what they have learned to add to and revise their answer at the end of the lesson. You might want to record students' thoughts and questions about the Essential Question by using chart paper or the whiteboard so they can reference them throughout the lesson.

Science and Engineering Practices:

I will *carry out an investigation.*

I will *plan an investigation.*

Have students read the "I will …" statements. Throughout the lesson, students will carry out and plan an investigation. If this is the first time you are teaching the **Science and Engineering Practice** of planning and carrying out an investigation, then inform students that scientists plan and carry out investigations to answer questions. The investigations provide data to support explanations.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How could you find out what happens when a solid is heated? Sample answer: I can plan and carry out an investigation with the solid.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What are the properties of liquids and gases?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION:Lesson 3: Days 2 and 3

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explore: *What hands-on/minds-on common experience(s) will you provide for students?*

- *Strategies: Assign group roles for investigation, allow students to create demonstrations or models, create visual models to support each step of the investigation.*

Inquiry Activity: Measuring Liquids

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Inquiry Activity:
Measuring Liquids
What to Expect Students will pour a certain volume of water into different containers and observe where the water height is in each container. Students will find that the water level is higher in narrower containers and lower in wider containers because water fills the containers from the bottom up.
Point out that students just saw a video about ice cubes becoming liquid water. Now they will compare liquid water in different containers.
Read the steps of the investigation together with students.
Make a Prediction Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to draw their predictions in their science notebook. Then have students explain their predictions based on previous observations.
Carry Out an Investigation

- **Record Data** Review with students how to read the liquid level in a measuring cup. They will not have to record the volume of liquid. However, they will need to be able to repeat the procedure multiple times, and they will need to know how to aim for the same mark on the measuring cup every time as accurately as possible. You may wish to set the volume that all groups should use and aim for, depending on the containers that are available. Help students pour the water into the different containers without spilling any of it. Consistency of water volume is important. Have students draw their results in the table in their science notebook.

During the Lesson

Talk About It:
Have students share their observations and data with their classmates.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How do your results compare with those of your classmates? Encourage students to compare and contrast their data and determine if they can identify patterns in the data.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Did you see any patterns in your data? If so, what did you see?

Crosscutting Concepts- Cause and Effect:
If this is the first time you have taught the **Crosscutting Concept** of cause and effect, help students understand that an effect is what happens and a cause is why it happens. Students might have observed a cause-and-effect relationship around their neighborhood.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- If there is water on the street outside your home, what might be the cause of it? Accept all reasonable answers. It could have rained. There could have been a flood. Someone could have been watering their plants, and water could have spilled out onto the street.

Have students answer questions in their science notebook.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What are the properties of liquids and gases?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION:Lesson 3: Days 4-7

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explain: *How will you help students connect their exploration to the concept/topic under investigation?*

- Strategies: Provide varied reading materials, utilize small group instruction, provide additional reading strategies and explanation of text.

Obtain and Communicate Information, Reflect and Refine, Science and Engineering Practices & Inquiry Activity: Gas has Mass

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

DAY 4

All About Gas Digital Interactive:
Have students complete the *All About Gas* Digital Interactive. Students will learn about different properties of gases.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What is a gas?
- How are a liquid and a gas similar?

Have students complete the questions in their science notebook.
Inquiry Activity:
Gas Has Mass
Purpose Students will compare the mass of two objects that contain gas.
What to Expect Students will blow up balloons to different degrees. They will tape a balloon on each end of a stick suspended from the ceiling in the middle and compare the two balloons' masses. The balloon with the greater mass will be closer to the floor.
Advanced Preparation Attach a string to the midpoint of a stick, such as a meter stick. Then attach the other end of the string securely to the ceiling. Make the string long enough to suspend the stick at about shoulder height or lower. Be sure the string-and-stick assembly does not interfere with any other objects in the classroom. You may want to test your setup with balloons attached. You may wish to make more than one such station, depending on space. If several stations are available, then the activity may be conducted in small groups instead.
Safety: Have students wear goggles to protect their eyes. The string-and-stick assembly may be a hazard, so take precautions. Be sure students do not pull on any of the materials while the materials are hanging from the ceiling.
Read the steps of the investigation together with students.

During the Lesson

Make a Prediction Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions in their science. Then have students explain their predictions based on previous observations.
Carry Out an Investigation

- Be sure students do not over-inflate their balloons. Assist them in tying off their balloons, if necessary. Encourage students to fill their balloons to different degrees so that there is some variety in the testing.
- Help students securely tape their balloons onto the stick.

Have students complete the questions in the *science notebook.*

DAY 5

Talk About It:

Have students share their observations with their classmates.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did your drawings compare with those of your classmates?
- Did you and your classmates make the same prediction? Did your results support your prediction?

Quick Check:

Use this opportunity to do a quick assessment to determine if students are ready to move on. Display the Quick Check slide from the teacher presentation and

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- **Compare and Contrast** How are liquids and gases alike and different?

Complete the graphic organizer as a class. If students were not able to describe some properties of liquids, then have them reread the *What Is a Liquid?* Science File. If they were not able to describe some properties of gases, then have them replay the *All About Gas* digital interactive.

Reflect and Refine:

Gases and Liquids

At this point, students can go back to the Page Keeley Science Probe in the ***Be a Scientist Notebook*** to decide whether they would like to change or justify their response. Students have had an opportunity to develop a conceptual understanding of gases and liquids. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

Science and Engineering Practices:

I can *carry out an investigation.*

I can *plan an investigation.*

Have students complete the "I can …" statements in the *Be a Scientist Notebook.* The "I can …" statements for this lesson reference the **Science and Engineering Practice** of planning and carrying out an investigation.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What investigation did you carry out?
- What investigation did you plan?

Leveled Readers:

Solids, Liquids, and Gases

This book serves as an introduction to the properties of these states of matter. Help students understand that matter has different structures and can be classified.

Gases Matter

This book serves as an introduction to the use and importance of gases in our everyday lives. Help students understand that many gases are vital for life on Earth.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What are the properties of liquids and gases?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION: Lesson 3: Day 6

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Elaborate: *How will students apply their learning and develop a more sophisticated understanding of the concept/topic?*

- Strategies: Allow choice for activities that provide varying levels of complexity and hands-on opportunities, allow students to respond with labeled pictures and illustrations.

Research, Investigate, and Communicate: Inquiry Activity

Lesson 3: Days

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**

➢ **Implement: Work Stations-Maker Space-Choice Boards**

- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon &

essential question with students as needed.

Research, Investigate, and Communicate:

Inquiry Activity

Gassy Bubbles

Purpose Students will plan and carry out an investigation on gases.

What to Expect First, students will participate in the planning of the investigation by putting the given steps in the correct order. Then students will carry out the investigation. Students will create bubbles in soapy water using air, a gas, from their lungs.

Read the steps of the investigation together with students.

Make a Prediction Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future.

Tell them to write their predictions in their notebook.

Notebook. Then have students explain their predictions based on previous observations.

Carry Out an Investigation

Note that the steps are in a random order. Tell students that they will have to put the steps in the correct order, as shown below, before they carry out the investigation. Tell students not to drink the soapy water.

1 Fill the tray with enough water to cover the bottom.
2 Add a few drops of dish soap and carefully stir with a straw.
3 Using the straw, blow gently into the water.
4 Record your observations.

Have students answer the questions in their science notebook.

During the Lesson

Carry Out an Investigation

Note that the steps in the ***Be a Scientist Notebook*** are in a random order. Tell students that they will have to put the steps in the correct order, as shown below, before they carry out the investigation. Tell students not to drink the soapy water.

1 Fill the tray with enough water to cover the bottom.
2 Add a few drops of dish soap and carefully stir with a straw.
3 Using the straw, blow gently into the water.
4 Record your observations.

Talk About It

Have students share their observations from the activity Gassy Bubbles.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Did you and your classmates come up with the same order of steps?
- Did you carry out the same investigation?
- How did your results compare to your classmates' results?

Elicit from students a discussion on the importance of planning and carrying out an investigation.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Why is it important to carefully plan an investigation?
- Give an example of poor planning.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What are the properties of liquids and gases?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION:Lesson 3: Days 7&8

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Evaluate: *How will students demonstrate their mastery of the learning objective(s)?*

- *Strategies: Utilize choice boards, make assessment accommodations, modify test items*

Performance Task: All Three States. Essential Question Reflections: *What are the properties of liquids and gases*

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

DAY 7

Performance Task:
All Three States
Purpose Students will observe water change from a solid to a liquid to a gas.
What to Expect Students will put an ice cube, which is solid water, in a plastic cup covered with plastic wrap. They will observe the ice cube melt into liquid water when heated in a sunny spot in the classroom. As the liquid water continues to be heated throughout the day, the liquid water will evaporate into a gas called water vapor. The water vapor will then condense on the inside of the container, appearing as water drops on the under-side of the plastic wrap.
Advanced Preparation Pre-cut the pieces of plastic wrap before the activity. If a sunny spot is not available in your classroom, then arrange to place the cups in another sunny location of your school. Alternatively, you may wish to set up a lamp to mimic the energy from the sun. Explain to students that the lamp is a model for the Sun. This is also an option if it is not sunny on the day of the investigation.

During the Lesson

Make a Prediction Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions in their science notebook. Then have students explain their predictions based on previous observations.
Read the steps of the investigation together with students.

Carry Out an Investigation

- Ensure that there are no gaps in the coverage of the plastic cup. Water vapor may escape into the air, and students may not see the condensation later in the day.
- Plan to have students visit the location of the cups several times throughout the day to observe their cups. Students should write their observations in a two-column table on a separate piece of paper. For the table, have students label the first column *Time* and the second column *Observations*. The tables will need several rows, one row for each time of day that students will make an observation. When students have filled in their data tables, have them glue their tables into their science notebook.

Have students answer the question in their science notebook.

DAY 8

Talk About It:
Have students share their observations from the activity All Three States.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did your results compare to your classmates' results?

- What could account for the variation? Sample answer: Some cups were heated a little bit more than others.
- How did your prediction compare to your classmates' predictions?
- Did your results support your prediction?

Essential Question:
What are the properties of liquids and gases?
Have students refer to the answers you recorded to this question at the beginning of the lesson and see if and how their thinking has changed. Discuss and share their answers as a large group. Have students answer the Essential Question in their science notebook.

Science and Engineering Practices:
I did *carry out an investigation.*
I did *plan an investigation.*
Have the students refer to the "I will …" and "I can …" statements.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How would you rate your ability to plan and carry out an investigation? Color in the number of stars that tell how well you did.

eAssessment:
You might want to assign students the lesson test from eAssessment. You can assign the premade lesson test, which is based on the **Disciplinary Core Ideas** for the lesson, or you can customize a test using the customization tool. For additional help with eAssessment, please reference the "How To" guide under Assessment in the main menu

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What are the properties of sof liquids and gases?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

<u>Online Learning Activities:</u>

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online

through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.

- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

Lesson 3 Resources

Be a Scientist Notebook Page 31
Be a Scientist Notebook Pages 32-33
Science File: *What is a Liquid?*
Be a Scientist Notebook Pages 34-35
Be a Scientist Notebook Pages 36-37
Be a Scientist Notebook Pages 38-39
Be a Scientist Notebook Pages 40-41

Lesson 4:	**Properties of Matter: Use Matter**	**Estimated Time: 9 Days**

Brief Overview of Lesson: The focus of this lesson is that different properties of matter are better used for different purposes. Different materials have different properties, making it important to use the more appropriate material in a design. Students will plan, construct, and test a model boat using materials they think are suitable.

This module culminates with students planning and carrying out an investigation to see which spoon can scoop hard ice cream. Students will apply their understanding of the structure and properties of matter to determine which material was best to scoop the ice cream.

What students should know and be able to do to engage in this lesson:

- Students will explore the phenomenon of boats by generating their own questions to answer throughout the lesson.
- Students will sketch, construct and test the boat model by carrying out an investigation.
- Students will obtain and communicate information by reading the Science Paired Read Aloud to learn about what happens when the wrong material and the right materials are used in a situation.
- Students will engage in an investigation by testing different materials to determine their properties.
- Students will be able to explain why designers want to use strong materials by using key details from the read aloud.
- Students will watch the video *Materials Have a Purpose* and explain their sequence of materials in order based on the quality.
- Students will research different types of boats, including what materials they are made of by carrying out an investigation and recording data.

- Students will use what they have learned about materials, their properties, and how to choose the best materials for a purpose in order to plan and build a model boat design using available classroom materials.
- Students will share their observations with their classmates by comparing and contrasting their observations.
- **Day 10:** Students will identify the best materials for building all kinds of things by comparing their findings from the beginning of the lesson.

LESSON FOUNDATION

Assessed Standards for this lesson	Important content not included in the standards
PS1.A: Structure and Properties of Matter • Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1) • Different properties are suited to different purposes. (2-PS1-2)	5.2.1: Children observe and investigate matter and energy. Observe, manipulate, sort, and describe objects and materials (e.g., water, sand, clay, paint, glue, various types of blocks, collections of objects, simple household items that can be taken apart, or objects made of wood, metal, or cloth) in the classroom and outdoor environment based on size, shape, color, texture, and weight.

Focus Question for this Lesson

What materials are best for building a boat?

Learning Intention	Success Criteria
Day 1: • I am learning that the properties of matter have strength, elasticity and durability. • I am learning about Aerospace Engineers. Days 2&3: • I am learning that different properties are suited for different purposes. Days 4&5: • I am learning that different properties are suited for different purposes. • I am learning about the properties of different materials. Days 6&7: • I am learning that different properties are suited for different purposes. Days 8&9: • I am learning about the best materials to build a boat.	Day 1: • I can share my written explanation based on the probe with my teammates. • I can discuss my questions about the phenomenon with my classmates. • I can discuss with my classmates what an Aerospace engineer has to do with understanding different materials or matter. Days 2&3: • I can explain how to make a boat. • I can create a model of a boat. • I can test to see if my boat will float. • I can read and answer questions using the Science Paired Read Aloud. Days 4&5: • I can test different materials to determine their properties. • I can complete a vocabulary concept map. • I can complete the cause and effect graphic organizer. • I can read and respond to the text *Matter, Properties, and Making Things.*

	Days 6&7: ● I can reflect and revise my response to Page Keeley Science Probe: Clay Boat. ● I can demonstrate how to choose the best materials for a purpose by completing a sequence graphic organizer. ● I can research materials used to build different types of boats. Days 8&9: ● I can plan, construct, and test a model boat. ● I can compare my boat with my classmates' boat. ● I can discuss and share how my thinking has changed about the *EQ:What materials are best for building a boat?* ● I can demonstrate my learning by completing lesson four assessment.

Assessment(s)

Self-Assessment/Peer Assessment/Teacher Assessment
Lesson 4:

- **Page Keeley Probe:** Clay Boat
- Make a Model Performance Task
- Performance Task: Make a Model Rubric
- Performance Project:
  - Analyze Materials Performance Project
  - Analyze Materials Rubric
- Properties of Matter: eAssessments
- **Claim Evidence Reasoning (Evidence Based Writing)**

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring:Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

Possible Preconceptions/Misconceptions:

- Students may think that all solids are rigid. Challenge students to think of other kinds of solids. For example, ask students to recall the sand that was used in Lesson 3.

- Ask students if they think sand is a solid or a liquid. After students give their responses, explain that sand is made up of many tiny, solid particles. Each particle has its own shape. Although sand can be "poured," it does not have the same properties as a liquid.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://wida.wisc.edu/teach/can-do/descriptors*

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level.
- Encourage creativity and original thinking.
- Provide opportunities to make claims. (CER)
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content

- Real world scenarios
- Student Driven Instruction

THE LESSON IN ACTION:Lesson 4: Days 1

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Engage: *How will you access students' prior knowledge? How will you capture students' interest and get students' minds focused on the concept/topic? Strategy: Conduct paired conversations, provide simple hands on experiment, allow students to draw ideas instead of writing.*

Module Opener, Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

Create charts utilizing the essential question, phenomenon and Page Keeley probe:

- Essential Question Chart must include students' questions and wondering about the EQ.
- Phenomenon Chart must include an image of the phenomenon and student' questions and comments.
- Page Keeley Probe chart must include an image of the probe along with the students' response. Students will revisit the probe later in the lesson to update their responses.

Assess Student Readiness:
Page Keeley Science Probe
Probe Strategies: *Sticky Bar- Commit and Toss-Gallery Walk- Four Corner- Card Sort*

Clay Boat

This probe is intended to uncover students' basic ideas about how some properties of matter can be used to change matter for specific purposes. Use this probe to assess prior knowledge and uncover misconceptions that will drive lesson instruction. Do not give students the answer. Students will return to the probe after completing the lesson to see how their thinking has changed.

Introduce the probe by showing students how a ball of clay sinks when put in water. Ask students to think about how they could change one of the properties of the clay to make it float. Point to each answer choice, and read it to students. Make sure students understand each answer choice. Then ask students to choose which property they would change to make the clay float.
Choose a talk configuration (pair, small group, whole class, or combination), and listen carefully as students share their explanations for their prediction. Use talk moves to help them explain their thinking.

During the Lesson

Science in My World: Phenomenon Science often begins when someone makes an observation about a situation or occurrence. Scientists refer to an event or situation that is observed or can be studied as a phenomenon. Spark your students' curiosity about the world by introducing the lesson phenomenon of boats. Show the photo and ask students what questions they have about boats and have them record them in the ***Be a Scientist Notebook***. If students are having trouble generating their own questions, then use the questions below to help guide a class discussion and get students thinking about what they saw and what they will learn in the lesson.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What did you see in the photo?
- What did you notice about the boats?
- What did you wonder about what you saw in the photo?
- What interests you about boats?

Help students turn their observations from the photo into questions that they can refer to during the lesson. Tell students that they do not need to be able to answer the questions that they generate right now. They will return to them later in the lesson.

STEM Career Kid Connection:

Aerospace Engineer

Introduce Career Kid Emily, who wants to be an aerospace engineer when she grows up. Have students read what Emily says.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Why might Emily be interested in boats?
- What does being an aerospace engineer have to do with understanding different materials or matter?

Essential Question:

What materials are best for building a boat?

Have students read the Essential Question. Have them use prior knowledge and observations to try to answer the question. Remind students that they are not expected to know the answer to this question right now, but throughout the lesson they will learn more and be able to apply what they have learned to add to and revise their answer at the end of the lesson. You might want to record students' thoughts and questions about the Essential Question by using chart paper or the white board so they can reference them throughout the lesson.

Science and Engineering Practices:

I will *plan and carry out an investigation.*

I will *analyze and interpret data.*

Have students read the "I will …" Throughout the lesson, students will plan and carry out investigations and analyze and interpret data. If this is the first time you are teaching the **Science and Engineering Practices** of planning and carrying out an investigation and of analyzing and interpreting data, then inform students that when investigations are planned and carried out, they produce data that can then be analyzed and interpreted.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How could you find out if a material can be used to build a boat?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What materials are the best for building a boat?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION: Lesson 4: Days 2&3

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explore: *What hands-on/minds-on common experience(s) will you provide for students?*

- *Strategies: Assign group roles for investigation, allow students to create demonstrations or models,create visual models to support each step of the investigation.*

Inquiry Activity: Material Mix-Up and Material Matters

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

During the Lesson

Inquiry Activity:
Material Mix-Up
Purpose Students will construct and test a model boat.
What to Expect Students will sketch a model boat that uses the provided materials. The goal is for the boat to hold a small eraser while floating on water. Students will then build and test their boats and sketch their results.
Point out that students just saw a photo of boats. Now they will use different materials to make a boat.
Read the steps of the investigation together with students.
Define a Problem Help students define the problem that they will solve by carrying out the design process. Remind them that defining the problem is an engineering practice that drives every solution. Tell them to write their problem in their science notebook.

Make a Model

- If necessary, help students build their model boats. They should follow their sketches. However, if students find that they need to modify their models as they're building them, then have them indicate any changes they made to their original sketch. In students' sketches of their results, encourage students to use labels and captions as necessary to describe their observations.

Have students complete the questions in their science notebook.

DAY 3

Material Matters:
Have students *Science Paired Read Aloud*. Students will learn about what happens when the wrong material and the right material are used in a situation. While reading, students will encounter the vocabulary word: *material*.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What game do Chester and Chandra want to play?
- What happens when they draw the hopscotch grid with water and a brush?
- What does Chester say about why the chalk works better?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What materials are the best for building a boat?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria.

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION: Lesson 4: Days 4&5

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explain: *How will you help students connect their exploration to the concept/topic under investigation?*

- Strategies: Provide varied reading materials, utilize small group instruction, provide additional reading strategies and explanation of text.

Obtain and Communicate Information, Testing Materials Simulation, Matter, Properties, and Making Things, Materials Have a Purpose

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Read the vocabulary words listed aloud. Have students circle vocabulary words that they have heard before. Using the teacher presentation slide, display the words and their definitions. You might want to have students add the words to a word wall so they can reference them as they move through the lesson. Explain to students that they will see the words used in the content that they will be learning.

Vocabulary development strategies: Graphic Organizers

- Word Splash

- Frayer Model
- Word Art

materials anything used for making and building new things
float to cause something to rest on top of a liquid
sink to go down below the surface of water
Students should have encountered the following words in their previous learning: *matter* and *property*. If students need to review the words *matter* and *property*, have them look up these words in *Matter Is All Around Us* in the ***Science Paired Read Aloud***. Make sure students understand what these words mean before continuing in the lesson.

Develop Vocabulary

materials Students may confuse *material* with *matter*. A material is something that is used to make and build things. Matter is anything at all that has mass and takes up space, whether it's used to make and build things or not.

float Demonstrate the word *float* using different objects. For example, bubbles float in air, and a beach ball floats in water.

sink Emphasize that this word is a verb. Ask students to describe the noun form (such as the kitchen sink, where you put dishes). Discuss how the verb form and noun form of a word can have different meanings.

During the Lesson

Testing Materials

Students will test different materials to determine their properties.
Read the questions together with students.

How to Use the Simulation Have students read the introduction and then click Start. First, students should select one of the forces on the left: Push, Pull, Bend, Strike, and Heat. The appropriate setup will appear in the center. Then they should select one of the materials on the right: Wood, Glass, Rubber, Steel, and Foam Core Board. That material will appear in the setup, along with a Test button at the base of the setup. Have students click Test and observe what happens to the material. The Test button may be pressed repeatedly to view the results multiple times. To select a new force and material to test, students can click the Back button in the top right to clear the field and start anew. Encourage students to select many different pairings in order to answer the question.

Crosscutting Concepts- Cause and Effect:

If this is the first time you have taught the **Crosscutting Concept** of cause and effect, tell students that an effect is what happens and a cause is why it happens. Students might have observed a cause-and-effect relationship during the simulation.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Suppose you saw a pile of broken glass. What might have caused it?

DAY 5

Matter, Properties, and Making Things:

Have students read the ***Science Paired Read Aloud***. Students will learn about using the best materials with the best properties in a variety of things. While reading, students will encounter the vocabulary word: *material*.

ASK:

- What do you call the matter from which something is made?

- The materials brick, stone, and steel, which are used in buildings, share what property?
- How are the materials for a table different from the materials for a mattress?

Have students complete the question in their science notebook.

Talk About It:
Use the Talk About It question to assess students' understanding of what they have learned so far. If students do not demonstrate understanding about materials, then have them revisit some activities in this lesson.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What materials are used to make a window?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What materials are the best for building a boat?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION:Lesson 4: Day 6

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explain: *How will you help students connect their exploration to the concept/topic under investigation?*

- Strategies: Provide varied reading materials, utilize small group instruction, provide additional reading strategies and explanation of text.

Quick Check, Refine and Refine , Research, Investigate, and Communicate

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Materials Have a Purpose Video:
Have students watch the video *Materials Have a Purpose*. It describes and demonstrates a variety of materials and their properties such as flexibility, strength, texture, and absorbency. Encourage students to think about the connection between the *properties* of a material and the possible *uses* for the material.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What might you make with a material that is soft and flexible?
- What type of materials would you want to use to build a desk?

Have students complete the questions in their science notebook.

During the Lesson

Quick Check:
Use this opportunity to do a quick assessment to determine if students are ready to move on. Display the Quick Check slide from the teacher presentation and
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- **Sequence: How** do you choose the best materials for a purpose?

Complete the graphic organizers as a class. If students were not able to determine how to choose the best materials for a purpose, then have them watch the *Materials Have a Purpose* video again. Emphasize how different materials were tested to determine the best material for the bridge.
Reflect and Refine:
Clay Boat
At this point, students can go back to the Page Keeley Science Probe to decide whether they would like to change or justify their response. Students have had an opportunity to develop a conceptual understanding of how matter can be used for specific purposes. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

Science and Engineering Practices:
I can *plan and carry out an investigation.*
I can *analyze and interpret data.*

Have students complete the "I can …" statements. The "I can …" statements for this lesson reference the **Science and Engineering Practices** planning and carrying out an investigation and of analyzing and interpreting data.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What investigation did you plan and carry out?
- What data did you analyze and interpret?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What materials are the best for building a boat?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION:Lesson 4: Day 7-

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Elaborate: *How will students apply their learning and develop a more sophisticated understanding of the concept/topic?*

- Strategies: Allow choice for activities that provide varying levels of complexity and hands-on opportunities, allow students to respond with labeled pictures and illustrations.

Research, Investigate, and Communicate: Inquiry Activity: Boat Research

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Research, Investigate, and Communicate:

Inquiry Activity- Boat Research
Students will research different types of boats, including what materials they are made of. They will learn about real boats and use that information to help them design their own model boats later.
Read the directions together with students.

Research
Encourage students to conduct research on a variety of boats that are of different shapes and materials and that have different uses. Ask students to gather information about boats from at least two sources. They should make a note of which sources they used.

Ask a Question
Help students ask a question that they will answer in the investigation. Remind them that asking questions is a science practice that drives every investigation. Tell them to write their question in their science notebook. Then have students explain how their question will be answered in the investigation.

During the Lesson

Record Data
Encourage students to focus on the materials of the boats, as well as the properties of those materials. Students may also describe other aspects, such as the shape and uses of the boats. Have students record their data in their science notebook.

Talk About It:
Have students share the data from their research on boats.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did your data compare to your classmates' data?
- Did you see any patterns in your data? If so, what patterns did you see?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What materials are the best for building a boat?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria.

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION: Lesson 4 Days:8-10-

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Evaluate: *How will students demonstrate their mastery of the learning objective(s)?*

- *Strategies: Utilize choice boards, make assessment accommodations, modify test items*

Performance Task: Make a Model, Essential Question Reflections: *What are the properties of solids?*
Performance Project- Analyze Materials

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**

➢ **Implement: Work Stations-Maker Space-Choice Boards**

- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed **Performance Task:**

- **Make a Model**
- Students will use what they have learned about materials, their properties, and how to choose the best materials for a purpose in order to plan and build a model boat design using available classroom materials. Students will then test their designs and compare them to their classmates' designs. The goal is for their boat to float on water while carrying a small eraser.
- Read the steps of the investigation together with students.
- **Define a Problem** Help students define the problem that they will solve by carrying out the design process. Remind them that defining the problem is an engineering practice that drives every solution. Tell them to write their problem in their science notebook.

During the Lesson

Make a Model

Encourage students to add labels and captions as necessary to their designs.

Help students build their boats if necessary. They should follow their drawings. However, if students find that they need to modify their models as they're building them, then have them indicate any changes they made to their original drawings.

Test:

Help students plan the way they will test the boat. Remind students of the setup they used at the beginning of the lesson. Point out that, not only should they test to see if their boats float, they should also determine if their boats will remain afloat when a small eraser is added.

Have students complete the questions in their science notebook.

DAY 9

Talk About It:

Have students share their observations from the activity.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Compare the designs of model boats in the class. What kinds of materials did you and your classmates use? How were the model boats alike and different?
- Was your boat able to float and carry the small eraser too? How did your classmates' boats do?

Essential Question:

What materials are best for building a boat?

Have students refer to the answers you recorded to this question at the beginning of the lesson and see if and how their thinking has changed. Discuss and share their answers as a large group. Have students answer the Essential Question in their science notebook.

Science and Engineering Practices:

I did *plan and carry out an investigation.*

I did *analyze and interpret data.*

Have the students refer to the "I will …" and "I can …" statements.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How would you rate your ability to plan and carry out an investigation and to analyze and interpret data? Color in the number of stars that tell how well you did.

DAY 10

Module Wrap-Up:

Performance Project- Analyze Materials

Students will identify the best materials for building all kinds of things. Some things need soft and flexible materials and other things need strong and hard materials. The students will use what they learned to find out which spoon will scoop hard ice cream best. They will make a prediction and plan and carry out an investigation.
Students will record their prediction, explain the steps they will use, and carry out their investigation.

eAssessment

You might want to assign students the lesson test from eAssessment. You can assign the premade lesson test, which is based on the **Disciplinary Core Ideas** for the lesson, or you can customize a test using the customization tool. For additional help with eAssessment, please reference the "How To" guide under Assessment in the main menu.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What materials are the best for building a boat?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
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Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
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Lesson 4 Resources

Be a Scientist Notebook Page 43
Be a Scientist Notebook Pages 44-45
Be a Scientist Notebook Pages 46-48
Be a Scientist Notebook Page 48
Be a Scientist Notebook Pages 48-49
Be a Scientist Notebook Pages 51-52

Science Songs K-2

Module: Changes to Matter

<table>
<tr><th colspan="3">Stage 1 – Desired Results</th></tr>
<tr><td rowspan="2">ASSESSED FOCUS STANDARDS:
PS1.A: Structure and Properties of Matter
• Different properties are suited to different purposes.
• A great variety of objects can be built up from a small set of pieces.

PS1.B: Chemical Reactions
• Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.

CONTENT CONNECTIONS:
Primary NJSLS ELA/Literacy Connections:
RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.</td><td colspan="2">Unit Description

Anchoring Phenomenon
 

Statement: Matter can exist in different forms.
Observation/Demonstration/Experience: Photo of the fruit bars melting in the Sun.
Driving Question: How do we describe matter?</td></tr>
<tr><td colspan="2">Meaning</td></tr>
<tr><td>ENDURING UNDERSTANDINGS
• Matter is the substance that all things are made of.
• All matter has mass, takes up space, and cannot share the same space with other matter.</td><td>ESSENTIAL QUESTIONS
• How can matter be arranged in different ways?
• What happens when you mix matter together?
• How do cooling and heating affect matter?</td></tr>
</table>

RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. RI.2.8 Describe how reasons support specific points the author makes in a text. W.2.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). W.2.8 Recall information from experiences or gather information from provided sources to answer a question.	• The three common states of matter are solid, liquid, and gas. • The state of matter can change depending on its temperature. • Matter is described in terms of properties such as size, mass, shape, color, and specific details of structure. • Mass is a measure of the amount of matter in an object. The mass of most objects can be measured with a pan balance. • Matter that has a shape of its own is called a solid. • A liquid is a substance that flows to fill the shape of its container. • The particles that make up a liquid are less tightly packed than the particles that make up a solid, which gives a liquid its fluid property. • A gas is a substance that does not have any shape. • Its particles are even farther apart than that of a liquid. • Volume is simply a measure of space, such as the capacity of a container. • Properties of materials include strength, elasticity, and durability.	
	What students will know and be able to do	
	KNOWLEDGE	**SKILLS** **2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials**

	Lesson 1: I can develop a model to show how matter can be arranged in different ways. **Lesson 2:** I can observe and explain whether mixtures can be taken apart. **Lesson 3:** I can gather information to determine if heating and cooling affect matter.	**by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]Planning and Carrying Out Investigations;Patterns** **2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.* [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.]Analyzing and Interpreting Data;Cause and Effect** **2-PS1-3. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.] Constructing Explanations and Designing Solutions;Energy and Matter** **2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. [Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.]Engaging in Argument from Evidence;Cause and Effect**
Stage 2 – Evidence		
SUMMATIVE ASSESSMENT(S)		

Performance Task:
Performance Project Design a Solution
Performance Project Rubric
Performance Task:
Lesson 1 Rearranging Matter
Lesson 1: Rearranging Matter. Rubric
Lesson 2 Can You Separate This?
Lesson 2: Can you separate this? Rubric
Lesson 3 Draw the Sequence
Lesson 3: Draw the sequence. Rubric
Assessments
Lesson 1
Lesson 2
Lesson 3
Module Test
STEM Gauge K-2

Claim Evidence Reasoning **(Evidence Based Writing)**

PRE-ASSESSMENT

Lesson 1:Page Keeley Probe: Big and Small Blocks
Lesson 2: Page Keeley Probe: Mixing Salt and Sand
Lesson 3: Page Keeley Probe: Melted Butter

Integration of 21st Century Skills	Integration of Technology	Career Education
9.4.2.CI.1: Demonstrate openness to new ideas and perspectives. **9.4.2.CI.2:** Demonstrate originality and inventiveness in work. **9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem. **9.4.2.CT.2:** Identify possible approaches and resources to execute a plan. **9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).	**McGraw Hill Digital Resources via CLEVER** Changes to Matter: Vocabulary Chef George Slides Making Cookies Mixtures Mixtures slides Making Stone Glass Blowing Change It Changes in matter by heating and cooling. **Science Songs K-2** **Discovery Education** Physical Change Mixtures Mixture song Chemical Changes **Mystery Science** Material Magic Can you really fry an egg on a hot sidewalk?	**Construction Manager** Introduce Career Kid Finn, who wants to be a construction manager when he grows up. **Welder** Career Kid Hannah, who wants to be a welder when she grows up.

	Why are so many toys made out of plastic? Could you build a house out of paper	

Stage 3 – Learning Plan

UNIT VOCABULARY

assemble chemical change condense disassemble dissolve evaporate freeze heat	mixture solution chemical change dissolve physical change solution temperature mixture	temperature thermometer evaporate condense freeze heat melt cool burn

SUMMARY OF KEY LEARNING

Lesson 1:Put Matter Together

Lesson 1: Day 1 - Module Opener, Vocabulary, Phenomenon, STEM Career connection, Essential Question Science and Engineering Practice

- **Learning Intention:**
  - I am learning that matter can be arranged in different ways.
- **Success Criteria:**
  - I can ask questions about the phenomenon of "liquid being poured into the mold".
  - I can discuss some of the responsibilities of a construction manager.
- **Brief Overview of Lesson:** Students are engaged through the phenomenon of liquid being poured into a mold. The STEM career of a construction manager prompts students to ask questions about how matter changes.

Lesson 1: Day 2 - Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Learning Intention:**
  - I am learning that matter can be arranged in different ways.
- **Success Criteria:**
  - I can respond to the best claim about how blocks are arranged and explain my thinking.
  - I can discuss and ask questions about the phenomenon of the 'work site".
  - I can ask additional questions about the essential question: How can matter be arranged in different ways?
- **Brief Overview of Lesson:** Spark your students' curiosity about the world by introducing the lesson phenomenon of a work site. Introduce them to the STEM career Kid Connection: Welder. Then have students read and question the essential question.

Lesson 1: Day 3 - Inquiry Activity: Observing Mass with Clay

- **Learning Intention:**
  - I am learning that changing the shape of an object does not affect its mass.
- **Success Criteria:**
  - I can make and share my prediction about the mass of clay changing.
  - I can measure the mass of clay and record the data.
  - I can reshape the clay and measure the mass.
  - I can compare the mass of the original clay with the reshaped.

Brief Overview of Lesson: Students will explore how the shape of a clay object does not affect its mass.

Lesson 1: Days 4-7 - Obtain and Communicate Information; *Inquiry Activity- Get Connected*
Reflect and Refine, Science and Engineering Practices

- **Learning Intention:**
  - I am learning that matter can be changed physically.
  - I am learning that matter can be assembled and disassembled.
- **Success Criteria:**
  - I can explore the digital interactive Chef George and discuss with my classmates.
  - I can make a prediction about how two objects are alike and how they are different?
  - I can use a variety of connecting cubes to create an object and illustrate.
  - I can use the same cubes to make a different object and illustrate.
  - I can explain how the two objects are alike to my classmates.
- **Brief Overview of Lesson:** Students will explore the concept of parts and whole as they develop models out of connecting cubes.

Lesson 1: Day 8 - Research, Investigate and Communicate: Inquiry Activity; Find What affects Mass

- **Learning Intention:**
  - I am learning that the mass of an object is the same as the mass of the pieces that make up the objects.
- **Success Criteria:**
  - I can make a prediction about whether the mass of an object will be the same once you break it into pieces.
  - I can measure the mass of objects and record the data.
  - I can explain if my prediction was correct. Why?
- **Brief Overview of Lesson:** Students will observe that the mass of an object is the same as the mass of the pieces that make up the object. Students will also make firsthand observations and explanations as they find the mass of an object, break it apart, and then find the mass of its pieces.

Lesson 1: Days 9 & 10-Performance Task and eAssessment.

- **Learning Intention:**
  - I am learning that matter can be arranged in different ways.
- **Success Criteria:**
  - I can create a different model from my partners using the same amount of matter.
  - I can describe and draw my object,
  - I can describe and draw my partner's object.
  - I can discuss and share my claim with evidence based on the *EQ:How can matter be arranged in different ways?*
  - I can demonstrate my learning by completing lesson one assessment.
- **Brief Overview of Lesson:** Students will provide evidence that they and their partner can make different objects with the same amount and type of matter.
  Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: How can matter be arranged in different ways*?* Students will see whether and how their thinking has changed. Students will complete lesson one assessment.

Lesson 2: Mixtures

Lesson 2: Day 1 - Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Learning Intention:**

- I am learning that different types of matter can be mixed together.

- **Success Criteria:**
  - I can share my written explanation based on the probe (mixing salt and sand) with my teammates.
  - I can discuss my questions about the phenomenon (mixtures being created) with my classmates.
  - I can explain why a welder must know about mixtures.
- **Brief Overview of Lesson:** Students are engaged through the phenomenon of a mixture being created. The STEM career of a welder prompts students to ask questions about mixtures.

Lesson 2: Day 2 -Inquiry Activity: Separating Mixtures

- **Learning Intention:**
  - I am learning that different types of matter can be mixed together.
  - I am learning that some mixtures can be separated.
- **Success Criteria:**
  - I can make a prediction about which mixtures can be separated.
  - I can record and share my observations with my classmates.
  - I can explain which filter best separates different mixtures.
- **Brief Overview of Lesson:** Students will experiment with different ways to separate mixtures.

Lesson 2: Days 3-6 - Obtain and communicate Information, Reflect and Refine and SEP

- **Learning Intention:**
  - I am learning that different types of matter can be mixed together.
  - I am learning that some mixtures can be separated.
- **Success Criteria:**
  - I can describe some everyday food mixtures to my classmates.
  - I can list the steps involved in separating a snack mix to my group.
  - I can explain how to separate a solution of salt and water.
  - I can use a graphic organizer to explain how a mixture is created.
- **Brief Overview of Lesson:** Develop science vocabulary using presentation slides, VKV, digital interactive and the science file article.

Lesson 2: Day 7 - Research, Investigate, and Communicate

- **Learning Intention:**
  - I am learning that changes in matter can be reversible and irreversible**.**
- **Success Criteria:**
  - I can make a prediction about how to separate a mixture of water and salt.
  - I can write and draw my observation of a salt and water mixture.
  - I can explain how my results from the salt and water task compares to my classmates.
  - I can compare the salt and water mixture with the milk and vinegar mixtures.
- **Brief Overview of Lesson:** Students will observe and describe the separation of different liquids.

Lesson 2: Days 8&9 - Performance Task and eAssessment.

- **Learning Intention:**
  - I am learning that changes in matter can be reversible and irreversible**.**
- **Success Criteria:**
  - I can analyze the given mixture and write my observations in my notebook.
  - I can develop a method to separate the mixture using the provided resources.
  - I can demonstrate my learning by completing lesson one assessment.
  - I can discuss and share my claim with evidence based on the EQ:What happens when you mix matter together*?*

- **Brief Overview of Lesson:** Students will demonstrate an understanding of mixtures by creating a method to separate a given mixture. Students will reflect on the lesson phenomenon and refer to their claim based on the essential question: What happens when you mix matter together? Students will see whether and how their thinking has changed. Students will complete lesson two assessment.

Lesson 3: Temperature Changes Matter

Lesson 3: Day 1-Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Learning Intention:**
  - I am learning that heating and cooling affect matter.
- **Success Criteria:**
  - I can share my written explanation based on the probe (melting butter) with my teammates.
  - I can discuss my questions about the phenomenon (of an artist heating glass) with my classmates.
- **Brief Overview of Lesson:** Students are engaged through the phenomenon of an artist heating the glass ball. The STEM career of a welder prompts students to ask questions about heating and cooling.

Lesson 3: Days 2 and 3 - Inquiry Activity; Heat and Ice and *Abe and Abby's Big Surprise*.

- **Learning Intention:**
  - I am learning that heating and cooling affect matter.
- **Success Criteria:**
  - I can make a prediction about which cup will melt an ice cube faster.
  - I can observe and contrast an ice cube in cold water and in hot water.
  - I can record the temperatures on a data table.
  - I can draw and label observations before and after.
  - I can read "Abe and Abby's Big Surprise" and discuss the book with my classmates.
- **Brief Overview of Lesson:** Students will observe how heat affects ice. They will also learn how temperature affects water by reading "Abe and Abby's Big Surprise".

Lesson 3: Days 4-7 - Obtain and communicate Information, Reflect and Refine and SEP

- **Learning Intention:**
  - I am learning that heating and cooling affect matter.
- **Success Criteria:**
  - I can explain what causes water droplets to form on the outside of a cold glass of tea to my classmates.
  - I can use VKV to describe what melting and freezing are and how they are related to heat.
  - I can discuss examples of changes that are reversible.
  - I can record and discuss my data based on the "Change It" simulation.
  - I can create a list and discuss ways that heat changes matter.
- **Brief Overview of Lesson:** Develop science vocabulary using presentation slides, VKV, "Change It" simulation, Changes in matter video, and science file article.

Lesson 3: Day 8 - Research, Investigate, and Communicate: Inquiry Activity: YOU Change It.

- **Learning Intention:**
  - I am learning that heating and cooling affect matter.
- **Success Criteria:**
  - I can create a list of questions that will be answered in my investigation.
  - I can list the steps I will use to conduct my investigation.
  - I can record the effects of heating and cooling in my notebook.
  - I can compare my investigation results with my classmates.

- **Brief Overview of Lesson:** Students will observe how heating and cooling different objects affect the objects

Lesson 3-Days 9 &10 - Performance Task & Project, eAssessment.

- **Learning Intention:**
  - I am learning that heating and cooling affect matter.
- **Success Criteria:**
  - I can make a prediction of what will happen to butter during the day and night.
  - I can draw how I think the butter will change when heated by the sun and cooled at night.
  - I can design a solution to solve the problem of how to shape a sidewalk.
  - I can draw my solution, create a list of the needed materials and identify the steps to create a mold for the sidewalk.
  - I can demonstrate my learning by completing lesson three assessment.
  - I can discuss and share my claim with evidence based on the EQ: How do cooling and heating affect matter*?*
- **Brief Overview of Lesson:** Students will describe how butter will change when heated and cooled. Students will reflect on the lesson phenomenon and refer to their claim based on the EQ: **How do cooling and heating affect matter?** Students will design a solution to the problem of how to shape a sidewalk. Students will see whether and how their thinking has changed. Students will complete lesson three assessment.

Using the Leveled Readers: Make a Pizza

Summary This book explores how matter can be changed through mixing and heating.

When to Use Use this book in the Explain section in Lesson 3 after discussing how temperature changes matter. This book serves as an extension of how heating changes matter, especially in cooking. Help students understand that making a pizza includes both physical and chemical changes.

CULTURALLY RESPONSIVE TEACHING in PRACTICE	**SOCIAL EMOTIONAL LEARNING in PRACTICE**
A culturally responsive approach to science instruction involves the recognition of community practices and knowledge as being central to the scientific endeavor. • Diversity in STEM: Nova: Secret Life of Scientist and Engineers) • Peter-Delfyett: 2020 winner of Streifer Scientific Achievement) • Impact News Here you will find the latest topical and news stories in the world of science. • Helping Communities! • Science News & Science News for students • Copper-Projects-in-Latin-America: Mysterious oil spill threatens marine biodiversity haven in Brazil	**Awareness of Self & Others: My Creative Strengths** Self-knowledge is the ability to understand one's own interests, feelings, weaknesses, and strengths, as well as learning and relating styles. Self-knowledge is the starting point for all social and emotional learning. In fact, self-knowledge influences all areas of SEL including self-management, social awareness, relationship skills, and responsible decision-making. **Self-knowledge** helps students to know when they are on the right path and are making decisions that are aligned with who they are. It also can serve as a guide when students are going against their own strengths,

• 8 projects bringing safe, sustainable water sources to communities around the world • Sambhar Salt Lake • Girls in STEM	styles, personalities, and purpose and help students re-align with who they are. The more a student understands him or herself, the better he or she will grow and adapt in all areas of life. **Self-Management:**Focus First! -Students will identify distractions and advocate for themselves in order to focus better in class. **Self-Management:**If at First You Don't Succeed... Students will practice strategies for persistence. **Self-Management:** Reach Your Goal-Students will identify a personal goal and the steps to achieve it. **Self-Management:** You Can Change It! Students will learn strategies for changing feelings, thoughts, and behaviors in stressful situations. **Self-Care:** I Believe in Me! Students will develop strategies for building belief to reach a goal**.** Self-efficacy is the belief in oneself. A student's self-efficacy greatly influences his or her academic motivation, learning, and achievement. Therefore, it is imperative that teachers address students' self-efficacy. Going-beyond-how-are-you-feeling This article focuses on:When students have the language to describe their feelings and needs, they are better equipped to help themselves and each other. Edutopia.org-Article/helping-students-process-their-feelings-during-remote-learning Why is it Important to Accept Others?

Lesson 1:	**Put Matter together**	**Estimated Time: 9 days**

Brief Overview of Lesson:
The focus of this lesson is that matter has different properties and can be arranged in different ways. Physical changes are changes in the way matter looks and how matter can be assembled or disassembled. Students will investigate how materials can be taken apart and put together and whether that affects a material's properties.

- Students will observe a photo of liquid being poured into the mold by creating their own questions to investigate during the lesson.
- Students will determine if the volume of matter changes if it is arranged in a different way by explaining their thinking.
- Students will measure the mass of a piece of clay, change its shape, and then measure the mass again by carrying out an investigation.
- Students will be able to explain how change in matter occurs through physical changes by participating in the digital interactive, *Through Chef Georges*.
- Students will learn about the physical changes that can take place in matter and make a prediction how two different objects can be created using the same material by reading the *Matter Changes* Science File.
- Students will conduct an investigation by using the same group of connecting cubes to build two unique objects.
- Students will make first hand observations and explanations as they find the mass of an object, break it apart, and then find the mass of its pieces by completing an investigation and recording their data.
- Students and their partners will make an object with the same amount and type of matter by using a list of available materials presented in the lesson.
- Students will see if and how their thinking has changed by referring to the answers recorded at the beginning of the lesson.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
PS1.A: Structure and Properties of Matter • Different properties are suited to different purposes. • A great variety of objects can be built up from a small set of pieces. **PS1.B: Chemical Reactions** • Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.	***Preschool science standards: Standard 5.2: Children observe and investigate matter and energy.*** Observe, manipulate, sort, and describe objects and materials (e.g., water, sand, clay, paint, glue, various types of blocks, collections of objects, simple household items that can be taken apart, or objects made of wood, metal, or cloth) in the classroom and outdoor environment based on size, shape, color, texture, and weight.

Focus Question for this Lesson

How can matter be arranged in different ways?

Learning Intention	**Success Criteria**
Day 1: ● I am learning that matter can be arranged in different ways. Day 2: ● I am learning that matter can be arranged in different ways. Day 3: ● I am learning that changing the shape of an object does not affect its mass. Days 4-7: ● I am learning that matter can be changed physically. ● I am learning that matter can be assembled and disassembled. Day 8: ● I am learning that the mass of an object is the same as the mass of the pieces that make up the objects. Days 9&10: ● I am learning that matter can be arranged in different ways.	Day 1: ● I can ask questions about the phenomenon of "liquid being poured into the mold". ● I can discuss some of the responsibilities of a construction manage Day 2: ● I can respond to the best claim about how blocks are arranged and explain my thinking. ● I can discuss and ask questions about the phenomenon of the 'work site". ● I can ask additional questions about the essential question: How can matter be arranged in different ways? Day 3: ● I can make and share my prediction about the mass of clay changing. ● I can measure the mass of clay and record the data. ● I can reshape the clay and measure the mass. ● I can compare the mass of the original clay with the reshaped. Days 4-7: ● I can explore the digital interactive Chef George and discuss with my classmates. ● I can make a prediction about how two objects are alike and how they are different? ● I can use a variety of connecting cubes to create an object and illustrate. ● I can use the same cubes to make a different object and illustrate. ● I can explain how the two objects are alike to my classmates. Day 8: ● I can make a prediction about whether the mass of an object will be the same once you break it into pieces. ● I can measure the mass of objects and record the data. ● I can explain if my prediction was correct. Why? Days 9&10: ● I can create a different model from my partners using the same amount of matter.

	• I can describe and draw my object. • I can describe and draw my partner's object. • I can discuss and share my claim with evidence based on the *EQ:How can matter be arranged in different ways?* • I can demonstrate my learning by completing lesson one assessment.

Assessment(s)

Page Keeley Probe

Lesson 1:Page Keeley Probe: Big and Small Blocks

Assessments

Lesson 1

Performance Task:

Lesson 1 Rearranging Matter

Lesson 1: Rearranging Matter. Rubric

Claim Evidence Reasoning (Evidence Based Writing)

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Students may confuse mass and weight or think they are the same.
- An object's mass is a measure of the amount of matter in the object, whereas weight is a measure of the pull of gravity on the object.
- Mass is generally measured in grams or kilograms, while weight is measured in the customary units of ounces or pounds.
- Some students may think that changing water to ice is a chemical change because the properties of ice are different from those of water.
- Many students also think that *temperature* and *heat* mean the same thing.
- Heat is the transfer of thermal energy from a warmer substance to a colder one.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://wida.wisc.edu/teach/can-do/descriptors*

- Speak and display terminology

- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level.
- Encourage creativity and original thinking.
- Provide opportunities to make claims. **Claim Evidence Reasoning** **(Evidence Based Writing)**
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios
  - Student Driven Instruction

THE LESSON IN ACTION
Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.
Lesson Opening

Lesson 1: Put Matter Together

- **Engage:** *How will you access students' prior knowledge? How will you capture students' interest and get students' minds focused on the concept/topic? Strategy: Conduct paired conversations, provide*

simple hands-on experiments, allow students to draw ideas instead of writing.

Lesson 1- Day 1: Module Opener, Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practices, Inquiry Activity

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question **Claim Evidence Reasoning** **(Evidence Based Writing)** with students as needed.

Module Opener:

Science in My World

Phenomenon Science often begins when someone makes an observation about a situation or occurrence. Scientists refer to an event or situation that is observed or can be studied as a phenomenon. Introduce the module by showing students the photo of the liquid being poured into the mold. Ask students what questions they have about the phenomenon. Have them record their questions in their science notebook. Use the questions below to elicit student responses.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What do you observe about the mold?
- What happens to the water when it is poured in the mold?
- What do you think might happen to the water if the mold is put into a freezer?

Help students turn their observations from the photo into questions that they can refer to during the module. Let students know that they do not

During the Lesson

need to be able to answer the questions that they generate now. They will return to them later in the module. You may wish to brainstorm questions as a class.

Key Vocabulary:

Point out the Key Vocabulary

Vocabulary: assemble, chemical change, condense, disassemble, dissolve, evaporate, freeze, heat, mixture, physical change, solution, temperature

These words are a selection of important vocabulary that will be used throughout the module. Remind students to listen for these Key Vocabulary words as they complete the module.

Students begin each lesson by making observations in the Engage and Explore sections, prior to learning the lesson vocabulary. In these sections of the lessons, students are expected to explain what they observe using familiar words. Vocabulary is introduced at the beginning of the Explain section. After learning the vocabulary and definitions, students are expected to transition to using these academic vocabulary words in their

observations and explanations. Students will learn these words and use them in context by the end of the lesson.

STEM Career Kid Connection:

Construction Manager

Introduce Career Kid Finn, who wants to be a construction manager when he grows up. A construction manager plans projects and makes sure that they stay on schedule. Read aloud to students what Finn says. Then read aloud the question. You may wish to have students drag a finger across the words as you read what is in the box aloud with them.

Have students complete the task in their science notebook.

Science and Engineering Practices:

I will *construct explanations.*

I will *engage in argument from evidence.*

Have students read the "I will …" The "I will …" statements for this module reference the science and engineering practices of constructing explanations and engaging in argument from evidence.

- If this is the first time you are teaching these science and engineering practices, then help students understand that an explanation is a statement that tells how or why. An example of an explanation is: "The sidewalk is wet because it had just rained." Scientists often construct, or put together, explanations.
- You may also want to inform students that an argument is a discussion of opinions or different points of view. Scientists engage in, or take part in, arguments to tell what they think. Arguments are often based on evidence. Evidence could be information scientists have researched in the library or observations they have made during an activity.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How can matter be arranged in different ways?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

<u>Online Learning Activities:</u>

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual

field trips, McGraw Hill Digital resources and Investigations.

- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

- ***Engage:*** *How will you access students' prior knowledge? How will you capture students' interest and get students' minds focused on the concept/topic? Strategy: Conduct paired conversations, provide simple hands-on experiments, allow students to draw ideas instead of writing.*

Lesson 1: Day 2 - Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Assess Lesson Readiness: Page Keeley Science Probe

Probe Strategies: *Sticky Bar- Commit and Toss-Gallery Walk- Four Corner- Card Sort*

This probe can be used as an elicitation prior to introducing a lesson. The probe is used in a talk format. It can be used for pair talk, small-group talk, whole class discussion, or a combination of talk configurations. Introduce the probe by showing a picture of ice cubes, and the comments made by students. Have the students discuss which of the comments they agree with and why. Choose a talk configuration (pair, small group, whole class, or combination) and listen carefully as students share their thinking. Students will explain their choice using the Claim Evidence Reasoning graphic organizer.

Create charts utilizing the essential question, phenomenon and Page Keeley probe:

- Essential Question Chart must include students' questions and wondering about the EQ.
- Phenomenon Chart must include an image of the phenomenon and students' questions and comments.
- Page Keeley Probe chart must include an image of the probe along with the student's response. Students will revisit the probe later in the lesson to update their responses.

Big and Small Blocks

This probe can be used as an elicitation prior to introducing a lesson on putting parts together to make an object. This probe can be used for pair talk, small-group talk, whole-class discussion, or a combination of talk configurations. The students select the claim that best matches their thinking about parts and wholes. Introduce the probe by showing the students how a large block can be made from four smaller blocks. Ask students to think about whether the large block has the same amount of matter as all of the four smaller blocks together. Take the large block apart, and show the collection of four smaller blocks. Point to each answer choice, and read it to students. Make sure students understand each answer choice. Then ask students to choose the claim that best matches their thinking. Choose a talk configuration (pair, small group, whole class, or combination), and listen carefully as students share their explanations for their claim. Use talk moves to help them explain their thinking.

During the Lesson

Science in My World: Phenomenon

Science often begins when someone makes an observation about a situation or occurrence. Scientists refer to an event or situation that is observed or can be studied as a phenomenon. Spark your students' curiosity about the world by introducing the lesson phenomenon of a work site.

Show the photo and ask students what questions they have about the work site and have them record them in their science notebook. If students are having trouble generating their own questions, then use the questions below to help guide a class discussion and get students thinking about what they saw and what they will learn in the lesson.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What did you see in the photo?
- What did you notice about the work site?
- What did you wonder about what you saw in the photo?
- What interests you about the work site?

Help students turn their observations from the photo into questions that they can refer to during the lesson. Tell students that they do not need to be able to answer the questions that they generate right now. They will return to them later in the lesson.

STEM Career Kid Connection:

Welder

Introduce Career Kid Hannah, who wants to be a welder when she grows up. She likes to take things apart, put them back together, and repair things that are broken. Have students read what Hannah says.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Why might Hannah be interested in a work site?

Essential Question:

How can matter be arranged in different ways?

Have students read the Essential Question. Have them use prior knowledge and observations to try to answer the question. Remind students that they are not expected to know the answer to this question right now, but throughout the lesson they will learn more and be able to apply what they have learned to add to and revise their answer at the end of the lesson. You might want to record students' thoughts and questions about the Essential Question by using chart paper or the white board so they can reference them throughout the lesson.

Science and Engineering Practices:

I will *construct explanations.*

I will *engage in argument from evidence.*

Have students read the "I will…" statements. Throughout the lesson, students will construct explanations and engage in arguments about how matter can be arranged. If this is the first time you are teaching the **Science and Engineering Practice** of constructing explanations and of engaging in argument from evidence, then point out that an explanation is a statement that tells how or why and that an argument is a discussion for or against something. Share with students that scientists often construct explanations when they engage in arguments.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What explanation might you construct to describe what is happening in the work site photo?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How can matter be arranged in different ways?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

<u>Online Learning Activities:</u>

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.

- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
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THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explore: *What hands-on/minds-on common experience(s) will you provide for students?*

- *Strategies: Assign group roles for investigation, allow students to create demonstrations or models, create visual models to support each step of the investigation.*

Lesson 1: Day 3 - Inquiry Activity: Observing Mass with Clay

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

During the Lesson

Inquiry Activity:

Observing Mass with Clay

Students will measure the mass of a piece of clay, change its shape, and then measure the mass again. Students will see that the clay does not change mass even though it changes shape.

Point out that students just saw a photo of a work site with different types of matter arranged in different ways. Now students will look at one type of matter—clay—and make observations about it before and after it has been rearranged into a different shape.

Read the steps of the investigation together with students.

Make a Prediction Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions in their science notebook. Then have students explain their predictions based on previous observations.

Carry Out an Investigation

- Record Data: Have students record their data in the table in their notebook.
- If necessary, remind students how to use the pan balance and the gram mass set. You may wish to demonstrate their use. Remind students to use the correct units (g) when recording the mass of the clay in the table.

- Allow students to give suggestions for how the clay could be reshaped. Be sure students do not break off any part of the clay as they reshape it, as doing so would affect their measurements. Students should also not add any clay.

Have students complete the questions in their science notebook.

Talk About It:

Have students share their observations and data with their classmates.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did your results compare with your classmates' results?
- Do your results support your prediction? What about your classmates?
- Why do you think the clay's mass did not change after you reshaped the clay?

Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk. ***Wait Time***

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How can matter be arranged in different ways?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant

responses or email their feedback.

THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explain: *How will you help students connect their exploration to the concept/topic under investigation?*

- *Strategies: Provide varied reading materials, utilize small group instruction, provide additional reading strategies and explanation of text.*

Lesson 1: Days 4-7 - Obtain and Communicate Information; *Inquiry Activity- Get Connected*
Reflect and Refine, Science and Engineering Practices

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

DAY 4

Obtain and Communicate Information:

Vocabulary

- Have students open in the ***Be a Scientist Notebook***. Read the vocabulary words listed aloud. Have students circle vocabulary words that they have heard before. Using the teacher presentation slide, display the words and their definitions. You might want to have students add the words to a word wall so they can reference them as they move through the lesson. Explain to students that they will see the words used in the content that they will be learning.
- **assemble** to gather into a group
- **physical change** a change in the way matter looks
- **disassemble** to take apart
- Students should have encountered the following word in their previous learning: *matter*. Make sure students understand what this word means before continuing in the lesson.

During the Lesson

Chef George Digital Interactive:

Before launching the Digital Interactive, ask students if they have ever made a sandwich. Have them describe the sandwich, how they made it, and what ingredients they used. Then have students launch the interactive *Chef George* in which students observe Chef George preparing a huge sandwich. He begins with all the ingredients on the table and uses all of the ingredients in his sandwich. At the end of the Digital Interactive, Chef George sees that five kids need to share this sandwich, so he cuts it into several smaller sandwiches. Cutting the sandwich into smaller pieces is an example of a physical change. While reading, students will encounter the vocabulary word: *physical change*.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did Chef George put together the sandwich?
- Why couldn't the kids eat the sandwich Chef George made?
- How did Chef George solve the problem?

Have students complete the questions in their science notebook.

Develop Vocabulary:

physical change Have students describe what they think *physical* and *change* each means by itself. Accept all reasonable answers. Explain that one definition of *physical* is "in a form that you can see or touch." Discuss how this definition helps them understand what the whole term *physical change* means.

DAY 5

Matter Changes Science File:

Have students read the *Matter Changes* Science File to learn about the physical changes that can take place in matter. While reading, students will encounter the vocabulary words: *physical change, assemble,* and *disassemble.*

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Look at the set of building blocks. How could they be changed?
- What are some examples of physical changes?
- Popcorn is an example of what kind of change in matter?

Have students complete the questions in their science notebook.

Visual Kinesthetic Vocabulary:

Have students cut out and fill in the Dinah Zike Visual Kinesthetic Vocabulary from pages VKV297–VKV298 in the ***Be a Scientist Notebook***. Use the VKV to help students compare and contrast the words *assemble* and *disassemble*. Students will return to these pages in Lesson 3.

Talk About It:

Use the Talk About It question to assess students' understanding of what they have learned so far. If students do not demonstrate understanding about physical changes, then have them revisit some activities in this lesson.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How could you assemble and disassemble a garden salad?

DAYS 6 &7

Inquiry Activity:

Get Connected

Students, in small groups, will use the same group of connecting cubes to build two unique objects. Read the steps of the investigation together with students. Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions in their science notebook. Then have students explain their predictions based on previous observations.

Carry Out an Investigation

1. Brainstorm with students what objects they could create with the connecting cubes. Have students keep these ideas in mind for the next step of the activity too.
2. Ensure that students make a completely different object with the connecting cubes. Make sure students use the same number and types of connecting cubes in the second object.

Have students complete the question in their notebook.

Talk About It

Have students share their observations with their classmates.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How do your results compare with those of your classmates?

Crosscutting Concepts- Energy and Matter:

If this is the first time you have taught the **Crosscutting Concept** of energy and matter, help students understand that you have to put in energy in order to change matter. Have students think back to the clay activity.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What did you do to change the shape of the clay?

Explain that the action of moving their hands is energy (energy of motion). Reiterate that students put in energy to change matter, that is, to change the shape of the clay.

Have students answer the following question: What did you do to change the shape of the connecting cubes? in their notebook.

Quick Check:

Use this opportunity to do a quick assessment to determine if students are ready to move on. Display the Quick Check slide from the teacher presentation and

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- **Summarize** What are some examples of physical changes of matter you have learned about in this lesson?

Complete the graphic organizer as a class. If students were not able to give examples of physical changes from this lesson, then have them review the *Matter Changes* Science File.

Reflect and Refine:

Big and Small Blocks

At this point, students can go back to the Page Keeley Science Probe to decide whether they would like to change or justify their response. Students have had an opportunity to develop a conceptual understanding of parts and wholes. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

Science and Engineering Practices:

I can *construct explanations.*

I can *engage in arguments from evidence.*

Have students complete the "I can …" statements. The "I can …" statements for this lesson reference the **Science and Engineering Practice** of constructing explanations and of engaging in argument from evidence.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What explanation did you construct?
- How did you engage in argument?
- What was your evidence?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How can matter be arranged in different ways?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.
- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
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THE LESSON IN ACTION

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Lesson Opening

Elaborate: *How will students apply their learning and develop a more sophisticated understanding of the concept/topic?*

- Strategies: Allow choice for activities that provide varying levels of complexity and hands-on opportunities, allow students to respond with labeled pictures and illustrations.

Lesson 1: Day 8 - Research, Investigate and Communicate: Inquiry Activity; Find What affects Mass

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**

- **Do It Now in Science:** **Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

Research, Investigate, and Communicate Inquiry Activity:

Find What Affects Mass

Students will observe that the mass of an object is the same as the mass of the pieces that make up the object. Students will also make firsthand observations and explanations as they find the mass of an object, break it apart, and then find the mass of its pieces. Students will weigh the connecting cube shape as a whole as well as in pieces once the shape is disassembled.
Read the steps of the investigation together with students.
Make a Prediction: Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions in their science notebook. Then have students explain their predictions based on previous observations.

During the Lesson

Carry Out an Investigation

Record Data: Have students record their data in their notebooks. If necessary, review with students how to use the pan balance and the gram cubes.

Talk About It:

Have students share their observations from the activity Rearranging Matter.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

1. What was your pair's result?
2. Choose another pair in the class. How does your result compare to the result of the other pair?

Using the Leveled Readers

Bicycle Metals

This book serves as an extension of what students learn about matter. Help students understand that bicycles are made of many components.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How can matter be arranged in different ways?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?

- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
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- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
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THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Lesson 1: Days 9 & 10-Performance Task and eAssessment.

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

Essential Question:

How can matter be arranged in different ways?

Have students refer to the answers you recorded at the beginning of the lesson and see if and how their thinking has changed. Discuss and share their answers as a large group. Have students answer the Essential Question with evidence in their science notebook.

During the Lesson

Science and Engineering Practices:
I did *construct explanations.*
I did *engage in argument from evidence.*
Have students refer to the "I will …" and "I can …" statements.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How would you rate your ability to construct explanations and to engage in argument from evidence?."

eAssessment:
You might want to assign students the lesson test from eAssessment. You can assign the premade lesson test, which is based on the **Disciplinary Core Idea** for the lesson, or you can customize a test using the customization tool. For additional help with eAssessment, please reference the "How To" guide under Assessment in the main menu.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How can matter be arranged in different ways?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
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Lesson 1 Resources

- Page Keeley Science Probe:
- Big and Small Blocks
- Be a Scientist Notebook Pages 56-57
- Be a Scientist Notebook Page 59
- Be a Scientist Notebook Pages 60-61
- Be a Scientist Notebook Page 62
- Science File: *Matter Changes*
- Be a Scientist Notebook Page 63
- Be a Scientist Notebook Pages 66-67
- Be a Scientist Notebook Pages 68-70

Lesson 2:	**Mixtures**	**Estimated Time: 9 days**

Brief Overview of Lesson: The focus of this lesson is that matter can be mixed and separated. A mixture is a combination of two or more different kinds of matter. Students will investigate the types of mixtures and methods for separating different mixtures.

What students should know and be able to do to engage in this lesson:

- Students will explore the probe of mixing sand and salt while deciding which claim is best.
- Students will explain how to separate mixtures by conducting an experiment and recording data observed in the investigation.
- Students will learn about different mixtures by watching the video *Mixtures.*
- Students will learn about several different types of everyday mixtures by watching the digital interactive, *Types of Mixtures.*
- Students will learn different ways to separate mixtures by reading the *Methods of Separation* Science File.
- Students will compare the separation of two liquid mixtures by observing what happens when drops of salt water solution are allowed to sit out overnight.
- Students will analyze a mixture provided to them and use the available materials to develop a method to separate the mixture by participating in the Performance Task, *Can You Separate This?*
- Students will decide whether to change or justify their responses by revisiting the Page Keeley Science Probe.

LESSON FOUNDATION	
Assessed Standards for this lesson	**Important content not included in the standards**
PS1.A: Structure and Properties of Matter • Different properties are suited to different purposes.	***Preschool science standards: Standard 5.2: Children observe and investigate matter and energy.***

• A great variety of objects can be built up from a small set of pieces. **PS1.B: Chemical Reactions** • Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and	Observe, manipulate, sort, and describe objects and materials (e.g., water, sand, clay, paint, glue, various types of blocks, collections of objects, simple household items that can be taken apart, or objects made of wood, metal, or cloth) in the classroom and outdoor environment based on size, shape, color, texture, and weight.

Focus Question for this Lesson

What happens when you mix matter together?

Learning Intention	**Success Criteria**
Day 1: • I am learning that different types of matter can be mixed together. Day 2: • I am learning that different types of matter can be mixed together. • I am learning that some mixtures can be separated. Days 3-6: • I am learning that different types of matter can be mixed together. • I am learning that some mixtures can be separated. Day 7: • I am learning that changes in matter can be reversible and irreversible. Days 8&9: • I am learning that changes in matter can be reversible and irreversible.	Day 1: • I can share my written explanation based on the probe (mixing salt and sand) with my teammates. • I can discuss my questions about the phenomenon (mixtures being created) with my classmates. • I can explain why a welder must know about mixtures. Day 2: • I can make a prediction about which mixtures can be separated. • I can record and share my observations with my classmates. • I can explain which filter best separates different mixtures. Days 3-6: • I can describe some everyday food mixtures to my classmates. • I can list the steps involved in separating a snack mix to my group. • I can explain how to separate a solution of salt and water. • I can use a graphic organizer to explain how a mixture is created. Day 7: • I can make a prediction about how to separate a mixture of water and salt. • I can write and draw my observation of a salt and water mixture. • I can explain how my results from the salt and water task compares to my classmates.

	• I can compare the salt and water mixture with the milk and vinegar mixtures. Days 8&9: • I can analyze the given mixture and write my observations in my notebook. • I can develop a method to separate the mixture using the provided resources. • I can demonstrate my learning by completing lesson one assessment.

Assessment(s)

Lesson 2: Page Keeley Probe: Mixing Salt and Sand

Performance Task:

Lesson 2: Can You Separate This?

Lesson 2: Can you separate this? Rubric

Assessments

Lesson 2

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring:Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Students may confuse mass and weight or think they are the same.
- An object's mass is a measure of the amount of matter in the object, whereas weight is a measure of the pull of gravity on the object.
- Mass is generally measured in grams or kilograms, while weight is measured in the customary units of ounces or pounds.
- Some students may think that changing water to ice is a chemical change because the properties of ice are different from those of water.
- Many students also think that *temperature* and *heat* mean the same thing.
- Heat is the transfer of thermal energy from a warmer substance to a colder one.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://wida.wisc.edu/teach/can-do/descriptors*

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.

- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level.
- Encourage creativity and original thinking.
- Provide opportunities to make claims. (CER)
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios
  - Student Driven Instruction

THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Lesson 2: Mixtures

- ***Engage:*** *How will you access students' prior knowledge? How will you capture students' interest and get students' minds focused on the concept/topic? Strategy: Conduct paired conversations, provide simple hands-on experiments, allow students to draw ideas instead of writing.*

Lesson 2: Day 1 - Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

Probe Strategies: *Sticky Bar- Commit and Toss-Gallery Walk- Four Corner- Card Sort*

This probe can be used as an elicitation prior to introducing a lesson. The probe is used in a talk format. It can be used for pair talk, small-group talk, whole class discussion, or a combination of talk configurations. Introduce the probe by showing a picture of ice cubes, and the comments made by students. Have the students discuss which of the comments they agree with and why. Choose a talk configuration (pair, small group, whole class, or combination) and listen carefully as students share their thoughts. Students will explain their choice using the Claim Evidence Reasoning graphic organizer.

Create charts utilizing the essential question, phenomenon and Page Keeley probe:

- The Essential Question Chart must include students' questions and wondering about the EQ.
- Phenomenon Chart must include an image of the phenomenon and students' questions and comments.
- Page Keeley Probe chart must include an image of the probe along with the student's response. Students will revisit the probe later in the lesson to update their responses.

Assess Lesson Readiness:
Page Keeley Science Probe
Mixing Salt and Sand
This probe can be used as an elicitation prior to introducing a lesson on mixtures and the properties of the parts that make up the mixture. This probe can be used for pair talk, small-group talk, whole-class discussion, or a combination of talk configurations. The students select the claim that best matches their thinking about parts and wholes.
Introduce the probe by showing students sand (best not to use white sand for this probe) and salt. Mix the sand and salt together. Tell them that two friends have different ideas about whether the sand can be separated from the salt in the mixture. Point to each character's claim, and read it to the students. Make sure students understand each answer choice. Then ask students to choose the claim that best matches their thinking. Choose a talk configuration (pair, small group, whole class, or combination), and listen carefully as students share their explanations for their claim. Use talk moves to help them explain their thinking.
Throughout the Lesson
Use students' ideas to plan instruction during the module that will address their misconceptions or lack of understanding about how properties can be used to separate parts of a mixture, and help them gain new knowledge and use appropriate terminology related to mixtures and their properties. The probe should be revisited again after students have had the opportunity to develop conceptual understanding of properties of mixtures and can use concepts and terminology to explain their new thinking.

During the Lesson

Science in My World:

Phenomenon Science often begins when someone makes an observation about a situation or occurrence. Scientists refer to an event or situation that is observed or can be studied as a phenomenon. Spark your students' curiosity about the world by introducing the lesson phenomenon of a mixture being created.
Play the video and ask students what questions they have about the mixture being created and have them record them in their science notebook. If students are having trouble generating their own questions, then use the questions below to help guide a class discussion and get students thinking about what they saw and what they will learn in the lesson.

ASK:

- What did you see in the video?
- What did you notice about the mixture being created?
- What did you wonder about what you saw in the video?
- What interests you about the mixture being created?

Help students turn their observations from the video into questions that they can refer to during the lesson. Tell students that they do not need to be able to answer the questions that they generate right now. They will return to them later in the lesson.

STEM Career Kid Connection:

Welder

Reintroduce Career Kid Hannah, who wants to be a welder when she grows up. Have students read what Hannah says.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Why might it be important for a welder to know about mixtures? Accept all reasonable answers. Explain that when welders join two pieces of metal, the type of metal has to be the same. If the pieces are of two different types of metals—that is, if they are dealing with a mixture—then welders cannot join the pieces together. This is one reason why welders need to be able to identify mixtures.

Essential Question:

What happens when you mix matter together?

Have students read the Essential Question. Have them use prior knowledge and observations to try to answer the question. Remind students that they are not expected to know the answer to this question right now, but throughout the lesson they will learn more and be able to apply what they have learned to add to and revise their answer at the end of the lesson. You might want to record students' thoughts and questions about the Essential Question by using chart paper or the white board so they can reference them throughout the lesson.

Science and Engineering Practices:

I will engage in argument from evidence.

Have students read the "I will …" statement. Throughout the lesson, students will engage in arguments about what happens when matter is mixed together. If this is the first time you are teaching the **Science and Engineering Practice** of engaging in argument from evidence, explain to students that scientists engage, or take part in, arguments in order to discuss different opinions.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What kind of argument could you engage in about the video?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What happens when you mix matter together?**

- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
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THE LESSON IN ACTION

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Lesson Opening

Lesson 2: Mixtures

Explore: *What hands-on/minds-on common experience(s) will you provide for students?*

- *Strategies: Assign group roles for investigation, allow students to create demonstrations or models, create visual models to support each step of the investigation.*

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**

➢ **Implement: Work Stations-Maker Space-Choice Boards**

- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
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essential questions with students as needed.

Lesson 2: Day 2 -Inquiry Activity: Separating Mixtures

Inquiry Activity:

Separating Mixtures

Students will experiment with different ways to separate three different mixtures. Students choose from a coffee filter, strainer, and funnel and observe that different techniques are needed to separate the mixtures. A coffee filter in a funnel may be used to separate Mixture 1 (sand and water). A strainer may be used to separate Mixture 2 (rocks and sand). None of the available materials could be used to separate Mixture 3 (salt and water).

Point out that students just saw a video of a mixture being created. Now they will try to separate mixtures. Read the steps of the investigation together with students.

Make a Prediction Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions in their science notebook. Have students explain their predictions based on previous observations.

Carry Out an Investigation

1 Students may start with any mixture, as long as they work through all three mixtures during the activity.

2 Have paper towels and a brush and dustpan on hand for clean-up. For Mixture 3 (salt and water), challenge students to how to separate it.

During the Lesson

Evaporation as a method for separation will be covered later in this lesson.

3 **Record Data** Have students record observations and results in the tables in the *Be a Scientist Notebook*. Remind students they should still record a result even if it was unsuccessful. Explain that in science it is important for all observations to be recorded.

Have students complete the questions in their science notebook.

Talk About It:

Have students share their observations and data with their classmates.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- For Mixtures 1 and 2, how did your results compare with your classmates' results?
- Were you or your classmates able to separate Mixture 3?
- Why not? Accept all reasonable answers. Depending on students' prior knowledge and experience, they may say that the salt is dissolved in the water or that the salt is too small and passes through the holes of the filters. Inform students that they will learn about a way to separate a mixture of salt and water later in the lesson.

Invite students to also analyze the materials they used in the activity and discuss why they chose (or didn't choose) a particular filter.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Why couldn't the coffee filter be used to separate Mixture 2?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What happens when you mix matter together?**
- Update any additional questions to your Interactive Science Wall.

- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
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Lesson Opening

Lesson 2: Mixtures

Explain: *How will you help students connect their exploration to the concept/topic under investigation?*

- *Strategies: Provide varied reading materials, utilize small group instruction, provide additional reading strategies and explanation of text.*

Lesson 2: Days 3-6 - Obtain and communicate Information, Reflect and Refine and Science Practices

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
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DAY 3

Obtain and Communicate Information:
Vocabulary
Read the vocabulary words listed aloud. Have students circle vocabulary words that they have heard before. Using the teacher presentation slide, display the words and their definitions. You might want to have students add the words to a word wall so they can reference them as they move through the lesson. Explain to students that they will see the words used in the content that they will be learning.
mixture two or more different things put together
solution a kind of mixture with parts that do not easily separate
chemical change when matter changes into different matter
dissolve to mix evenly with a liquid and form a solution
Students should have encountered the following words in their previous learning: *physical change* and *matter*. Make sure students understand what these words mean before continuing in the lesson.

During the Lesson

Mixtures Video:
Have students watch the video *Mixtures* to learn about different types of mixtures. During the video, students will encounter the vocabulary word: *mixture*.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What are some everyday food mixtures?
- How is a sand castle an example of a mixture? What are the parts of the mixture?

Have students complete the questions in their science notebook.

Visual Kinesthetic Vocabulary:
Have students cut out and fill in the Dinah Zike Visual Kinesthetic Vocabulary from pages VKV295–VKV296 Use the VKV to help students describe what a mixture is.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What happens when you mix matter together?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
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THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Lesson 2: Mixtures

Lesson 2: Days 3-6 - Obtain and communicate Information, Reflect and Refine and SEP

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

DAY 4

Types of Mixtures Digital Interactive:
Have students complete the *Types of Mixtures* Digital Interactive. Students will learn about several different types of everyday mixtures. While reading, students will encounter the following vocabulary words: *mixture*, *solution*, *dissolve*, and *chemical change*.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What is in the mixture of the snack mix? nuts, seeds, and different dried fruits
- How could you separate this type of mixture?
- What is a solution? Give an example. A solution is made up of a solid dissolved in a liquid. A mixture of salt and water is an example of a solution.

Have students fill in the chart and answer the question in their science notebook.

During the Lesson

Develop Vocabulary:
solution Ask students if they know of another everyday meaning of the word *solution* such as a solution, or answer, to a problem). Discuss how this meaning is different from the meaning discussed in this lesson.
dissolve Demonstrate dissolving by sprinkling salt into a clear cup of water. You may wish to have volunteers feel the granules of salt with their fingers before the salt goes into the water and just after it enters the water. They will feel the grittiness of the granules. In a short time, the grittiness of the salt in the water will go away because the salt mixes with the water to form a solution. Explain that this is the act of dissolving. The salt hasn't gone away. It has mixed into the water.
Visual Kinesthetic Vocabulary:
Have students cut out and fill in the Dinah Zike Visual Kinesthetic Vocabulary from pages VKV299–VKV300 Help students use the VKV to distinguish between the terms *chemical change* from this lesson and *physical change*, which they learned in Lesson 1.

Talk About It
Use the Talk About It question to assess students' understanding of what they have learned so far. If students do not demonstrate understanding about mixtures, then have them revisit some activities in this lesson.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How are mixtures alike? How can they be different? Sample answer: Mixtures are alike because they all contain at least two different parts. Mixtures can be different because they contain different parts. Sometimes the parts are solids; sometimes they are liquids.

Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk. ***Wait Time***

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What happens when you mix matter together?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
- Prepare for in-class activities – In addition to assigning readings, providing some course content online

through video tutorials Requiring students to take an online quiz before attending class can be a source of motivation while providing instant feedback regarding their understanding of the material.

- Engage all students in discussions – Offering students the opportunity to discuss online accommodates a variety of learning preferences. Asynchronous (not confined by time) discussions allow students time to think and reflect before responding. Online discussions are also documented so students and instructors can always view, evaluate, and build on all contributions.
- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Lesson 2:Mixtures

Lesson 2: Days 3-6 - Obtain and communicate Information, Reflect and Refine and SEP

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

During the Lesson

DAY 4

Types of Mixtures

Digital Interactive:
Have students complete the *Types of Mixtures* Digital Interactive. Students will learn about several different types of everyday mixtures. While reading, students will encounter the following vocabulary words: *mixture, solution, dissolve,* and *chemical change*.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What is in the mixture of the snack mix? nuts, seeds, and different dried fruits
- How could you separate this type of mixture? Sample answer: I could pick out the different parts with my fingers.
- What is a solution? Give an example. A solution is made up of a solid dissolved in a liquid. A mixture of salt and water is an example of a solution.

Have students complete the chart and answer the questions in their science notebook.

Develop Vocabulary:

solution Ask students if they know of another everyday meaning of the word *solution* such as a solution, or answer, to a problem). Discuss how this meaning is different from the meaning discussed in this lesson.
dissolve Demonstrate dissolving by sprinkling salt into a clear cup of water. You may wish to have volunteers feel the granules of salt with their fingers before the salt goes into the water and just after it enters the water. They will feel the grittiness of the granules. In a short time, the grittiness of the salt in the water will go away because the salt mixes with the water to form a solution. Explain that this is the act of dissolving. The salt hasn't gone away. It has mixed into the water.

Visual Kinesthetic Vocabulary:
Have students cut out and fill in the Dinah Zike Visual Kinesthetic Vocabulary from pages VKV299–VKV300. Help students use the VKV to distinguish between the terms *chemical change* from this lesson and *physical change*, which they learned in Lesson 1.

Talk About It
Use the Talk About It question to assess students' understanding of what they have learned so far. If students do not demonstrate understanding about mixtures, then have them revisit some activities in this lesson.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How are mixtures alike? How can they be different? Sample answer: Mixtures are alike because they all contain at least two different parts. Mixtures can be different because they contain different parts. Sometimes the parts are solids; sometimes they are liquids.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What happens when you mix matter together?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
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THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Lesson 2: Mixtures

Lesson 2: Days 3-6 - Obtain and communicate Information, Reflect and Refine and SEP

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
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During the Lesson

DAYS 5 & 6

Methods of Separation Science File:
Have students read the *Methods of Separation* Science File to learn different ways to separate mixtures. While reading, students will encounter the following vocabulary words: *mixture, solution,* and *chemical change*.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How do you know which tool to use to separate a mixture?
- How does a filter work?
- How can you separate a solution of salt and water?

Have students complete the questions in the ***Be a Scientist Notebook***.

Foldables:
Have students make Shutter Fold Foldables.
Pair up students. With the shutter folded, have one student in the pair draw a mixture that can be separated. This drawing should be labeled *Before*. Then with the shutter open, have the other student in the pair draw the same mixture but with the different parts separated. This drawing should be labeled *After*. Invite students to work together to write a caption that explains how the mixture was separated.
See the Foldables study guides for more information on Foldables.

Quick Check:

Use this opportunity to do a quick assessment to determine if students are ready to move on. Display the Quick Check slide from the teacher presentation and

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- **Cause and Effect** How is a mixture created?

Complete the graphic organizer as a class. If students were not able to explain how to create a mixture, then have them watch the video *Mixtures* again. Ask them to identify what mixtures the people in the video are creating and describe how they do it.

Reflect and Refine

Mixing Salt and Sand

At this point, students can go back to the Page Keeley Science Probes In the ***Be a Scientist Notebook*** to decide whether they would like to change or justify their response. Students have had an opportunity to develop a conceptual understanding of mixtures and properties of matter. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

Science and Engineering Practices:

I can engage in arguments from evidence.

Have students complete the "I can …" statement on page 79 in the ***Be a Scientist Notebook***. The "I can …" statement for this lesson references the **Science and Engineering Practice** of engaging in argument from evidence.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did you engage in arguments?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What happens when you mix matter together?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

<u>Online Learning Activities:</u>

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.

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THE LESSON IN ACTION

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Lesson Opening

Elaborate: *How will students apply their learning and develop a more sophisticated understanding of the concept/topic?*

- Strategies: Allow choice for activities that provide varying levels of complexity and hands-on opportunities, allow students to respond with labeled pictures and illustrations.

Lesson 2: Mixtures

Lesson 2: Day 7: Research, Investigate, and Communicate

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

During the Lesson

DAY 7

Inquiry Activity:

Get Connected

Students, in small groups, will use the same group of connecting cubes to build two unique objects. Read the steps of the investigation on page 64 in the ***Be a Scientist Notebook*** together with students. Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions in the ***Be a Scientist Notebook***. Then have students explain their predictions based on previous observations.

Carry Out an Investigation

1. Brainstorm with students what objects they could create with the connecting cubes. Have students keep these ideas in mind for the next step of the activity too.

2 Ensure that students make a completely different object with the connecting cubes. Make sure students use the same number and types of connecting cubes in the second object.

Have students complete the questions in the ***Be a Scientist Notebook***.

Talk About It

Have students share their observations with their classmates.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How do your results compare with those of your classmates?

Crosscutting Concepts- Energy and Matter:

If this is the first time you have taught the **Crosscutting Concept** of energy and matter, help students understand that you have to put in energy in order to change matter. Have students think back to the clay activity.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What happens when you mix matter together?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

<u>Online Learning Activities:</u>

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
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and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Evaluate: *How will students demonstrate their mastery of the learning objective(s)?*

- *Strategies: Utilize choice boards, make assessment accommodations, modify test items*

Lesson 2: Mixtures

Lesson 2: Days 8&9: Performance Task and eAssessment.

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

During the Lesson

Performance Task:
Can You Separate This?
Students will analyze a mixture provided to them and use the available materials to develop a method to separate the mixture. The mixture will contain rocks, salt, sand, and water. There is more than one way for students to successfully separate the mixture. The following is one way: Students may separate the rocks from the mixture using the strainer. They may separate the sand from the remaining mixture using a coffee filter in a funnel. The final mixture of salt and water may be separated by heating the solution in the Sun.
Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions on page 82 in the Be a Scientist Notebook. Then have students explain their predictions based on previous observations.

Carry Out an Investigation

1. Inform students that there is more than one way to separate their mixture. Discuss different tools students may use. Remind them that their fingers are a tool, too, as they learned in the lesson. Students who choose to use the coffee filters as a means of separation first may have a messier activity than those who start with the strainer. This procedure can still work; they will need to hand separate all the rocks from the sand though.
2. Remind students of the *four* parts of the mixture, including the dissolved salt. Ask students to brainstorm how they could separate the water from the salt. (For example, they could allow the solution to dry in the Sun, leaving the salt behind.) With your approval, have them carry out their method. Have students record their data in the *Be a Scientist Notebook.*

Crosscutting Concepts- Energy and Matter:

If this is the first time you have taught the Crosscutting Concept of energy and matter, help students understand that you have to put in energy to separate matter.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What did you do to separate the mixture?
- Explain that the various actions involved in using the tools, moving mixtures around, and letting them fall through filters are all forms of energy (energy of motion). If students used the Sun to dry the salt and water mixture, then they also used the energy from the Sun to separate matter.

Have students answer questions in the *Be a Scientist Notebook.*

Talk About It:

Have students share their observations from the activity Can You Separate This?

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did your results compare to those of your classmates?
- Did any classmates separate the items in a different order than you? If so, how?

DAY 8

Essential Question:

What happens when you mix matter together?

Have students refer to the answers you recorded at the beginning of the lesson and see if and how their thinking has changed. Discuss and share their answers as a large group. Have students answer the Essential Question in the *Be a Scientist Notebook.*

Science and Engineering Practices:

I did *engage in argument from evidence.*

Have the students refer to the "I will …" and "I can …" statements in the *Be a Scientist Notebook.*

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How would you rate your ability to engage in argument from evidence? Color in the number of stars that tell how well you did.

eAssessment:

You might want to assign students the lesson test from eAssessment. You can assign the premade lesson test, which is based on the Disciplinary Core Idea for the lesson, or you can customize a test using the customization tool. For additional help with eAssessment, please reference the "How To" guide under Assessment in the main menu.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **What happens when you mix matter together?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?

- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
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- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

Lesson 2 Resources

- Mixing Sand and Salt
- Be a Scientist Notebook Page 73
- Be a Scientist Notebook Pages 74-76
- Be a Scientist Notebook Pages 74-76
- Be a Scientist Notebook Page 77
- Science File: *Methods of Separation*
- Be a Scientist Notebook Page 79
- Be a Scientist Notebook Pages 77-78
- Be a Scientist Notebook Pages 82-84

Lesson 3: Temperature Changes Matter	**Temperature Changes Matter**	**Estimated Time: 10 days**
Brief Overview of Lesson: The focus of this lesson is that heating and cooling affect matter in different ways. Heating and cooling change matter, which can be observed. These changes include both physical and chemical changes. Students will investigate how heating and cooling affect different materials and communicate their observations with classmates. This module culminates with students designing a solution for a new sidewalk.		

Students will apply their understanding of the properties of matter to determine which materials are best for building a mold for the sidewalk as well as list steps to create a mold.

What students should know and be able to do to engage in this lesson:

- Students will make initial explanations by observing a video of an artist heating a glass ball.
- Students will observe an ice cube in cold water and an ice cube in warm water to contrast the two and measure the temperature change of the water in each case by completing the Inquiry Activity, *Heat and Ice*.
- Students will learn how temperature affects water by reading the Science Paired Read Aloud, *Abe and Abby's Big Surprise*.
- Students will define the vocabulary words from this lesson and find key details in the text which elaborates on the meaning of the words by watching a teacher presentation slide that displays the words and their definitions.
- Students will learn how temperature changes matter through heating and cooling by reading the text, *Matter, Temperature and Change*.
- Students will learn more about how temperature causes matter to change by reading the *Temperature Changes Matter* Science File.
- Students will complete the Inquiry Activity, *You Change It* by choosing an object to heat in a microwave oven and cool in a freezer to demonstrate how solid and liquid matter can change.
- Students will demonstrate their understanding by drawing how they think butter will change when heated by the Sun and when cooled at night.
- Students will see if and how their thinking has changed by referring to the answers they recorded at the beginning of the lesson and comparing their findings with the class.
- Students will design a concrete mold that leads from the front of the school to the playground by creating an outline of how to create their mold.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
PS1.A: Structure and Properties of Matter • Different properties are suited to different purposes. • A great variety of objects can be built up from a small set of pieces. **PS1.B: Chemical Reactions** • Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and	***Preschool science standards: Standard 5.2: Children observe and investigate matter and energy.*** Observe, manipulate, sort, and describe objects and materials (e.g., water, sand, clay, paint, glue, various types of blocks, collections of objects, simple household items that can be taken apart, or objects made of wood, metal, or cloth) in the classroom and outdoor environment based on size, shape, color, texture, and weight.

Focus Question for this Lesson

How do cooling and heating affect matter?

Learning Intention	**Success Criteria**
Day 1: • I am learning that heating and cooling affect matter. Days 2&3:	Day 1: • I can share my written explanation based on the probe (melting butter) with my teammates.

● I am learning that heating and cooling affect matter. <u>Days 4-7:</u> ● I am learning that heating and cooling affect matter. <u>Day 8:</u> ● I am learning that heating and cooling affect matter. <u>Days 9 &10:</u> ● I am learning that heating and cooling affect matter.	● I can discuss my questions about the phenomenon (of an artist heating glass) with my classmates. <u>Days 2&3:</u> ● I can make a prediction about which cup will melt an ice cube faster. ● I can observe and contrast an ice cube in cold water and in hot water. ● I can record the temperatures on a data table. ● I can draw and label observations before and after. ● I can read "Abe and Abby's Big Surprise" and discuss the book with my classmates. <u>Days 4-7:</u> ● I can explain what causes water droplets to form on the outside of a cold glass of tea to my classmates. ● I can use VKV to describe what melting and freezing are and how they are related to heat. ● I can discuss examples of changes that are reversible. ● I can record and discuss my data based on the "Change It" simulation. ● I can create a list and discuss ways that heat changes matter. <u>Day 8:</u> ● I can create a list of questions that will be answered in my investigation. ● I can list the steps I will use to conduct my investigation. ● I can record the effects of heating and cooling in my notebook. ● I can compare my investigation results with my classmates. <u>Days 9 &10:</u> ● I can make a prediction of what will happen to butter during the day and night. ● I can draw how I think the butter will change when heated by the sun and cooled at night. ● I can design a solution to solve the problem of how to shape a sidewalk. ● I can draw my solution, create a list of the needed materials and identify the steps to create a mold for the sidewalk. ● I can demonstrate my learning by completing lesson three assessment.

Assessment(s)

Page Keeley Probe

Lesson 3: Page Keeley Probe: Melted Butter

Performance Task:

Performance Project Design a Solution

Performance Project Rubric

Performance Task:

Lesson 3 Draw the Sequence

Lesson 3: Draw the sequence. Rubric

Assessments

Lesson 3

Module Test

Claim Evidence Reasoning **(Evidence Based Writing)**

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Students may confuse mass and weight or think they are the same.
- An object's mass is a measure of the amount of matter in the object, whereas weight is a measure of the pull of gravity on the object.
- Mass is generally measured in grams or kilograms, while weight is measured in the customary units of ounces or pounds.
- Some students may think that changing water to ice is a chemical change because the properties of ice are different from those of water.
- Many students also think that *temperature* and *heat* mean the same thing.
- Heat is the transfer of thermal energy from a warmer substance to a colder one.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://wida.wisc.edu/teach/can-do/descriptors*

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers

- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level.
- Encourage creativity and original thinking.
- Provide opportunities to make claims. (CER)
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios
  - Student Driven Instruction

THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Lesson 3: Temperature Changes Matter

- **Engage:** How will you access students' prior knowledge? How will you capture students' interest and get students' minds focused on the concept/topic? Strategy: Conduct paired conversations, provide simple hands-on experiments, allow students to draw ideas instead of writing.

Lesson 3: Day 1-Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**

- **Do It Now in Science:** **Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

Probe Strategies: *Sticky Bar- Commit and Toss-Gallery Walk- Four Corner- Card Sort*

- This probe can be used as an elicitation prior to introducing a lesson. The probe is used in a talk format. It can be used for pair talk, small-group talk, whole class discussion, or a combination of talk configurations. Introduce the probe by showing a picture of ice cubes, and the comments made by students. Have the students discuss which of the comments they agree with and why. Choose a talk configuration (pair, small group, whole class, or combination) and listen carefully as students share their thoughts. Students will explain their choice using the Claim Evidence Reasoning graphic organizer.

Create charts utilizing the essential question, phenomenon and Page Keeley probe:

● Essential Question Chart must include students' questions and wondering about the EQ.
● Phenomenon Chart must include an image of the phenomenon and student' questions and comments.
● Page Keeley Probe chart must include an image of the probe along with the students' response. Students will revisit the probe later in
the lesson to update their responses.

During the Lesson

Assess Lesson Readiness:
Page Keeley Science Probe
Melted Butter
This probe can be used as an elicitation prior to introducing a lesson on how temperature changes matter. This probe can be used for pair talk, small group talk, whole class discussion, or a combination of talk configurations. Students select the claim that best matches their thinking and explain why.
Introduce the probe by telling students that two friends are gently heating solid butter. Tell them that each has a different idea about whether the melted butter can change back to solid butter. Make sure students understand each answer choice. Then ask students to choose the claim that best matches their thinking. Choose a talk configuration (pair, small group, whole class, or combination), and listen carefully as students share their explanations for their claim. Use talk moves to help them explain their thinking.
Use students' ideas to plan instruction during the module that will address their misconceptions and help them gain new knowledge and use appropriate terminology related to temperature and matter. The probe should be revisited again after students have had the opportunity to develop conceptual understanding of how temperature changes matter and can use concepts and terminology to explain their new thinking.
Teacher Explanation
The better answer is Lana's: Melted butter can change back to solid butter. Melted butter is butter in the liquid state. Heating can change the state of matter from a solid to a liquid. Cooling can change the liquid back to a solid, so the melted butter can change back to solid butter.
Science in My World:

Phenomenon Science often begins when someone makes an observation about a situation or occurrence. Scientists refer to an event or situation that is observed or can be studied as a phenomenon. Spark your students' curiosity about the world by introducing the lesson phenomenon of an artist heating a glass ball. Play the video and ask students what questions they have about the artist heating the glass ball and have them record them ***a Scientist Notebook***. If students are having trouble generating their own questions, then use the questions below to help guide a class discussion and get students thinking about what they saw and what they will learn in the lesson.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What did you see in the video?
- What did you notice about the artist heating the glass ball?
- What did you wonder about what you saw in the video?
- What interests you about the artist heating the glass ball?

Help students turn their observations from the video into questions that they can refer to during the lesson. Tell students that they do not need to be able to answer the questions that they generate right now. They will return to them later in the lesson.

STEM Career Kid Connection:
Welder

Reintroduce Career Kid Hannah, who wants to be a welder when she grows up.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What does welding have to do with heating and cooling? Accept all reasonable answers. Explain that welders join two pieces of metal by heating a rod of the same type of metal. This melted metal rod flows easily and can be laid between the two pieces, connecting them. Then the metal is allowed to cool, and the melted metal from the rod becomes solid again. The two pieces have become one larger piece.

Essential Question:
How do cooling and heating affect matter?

Have students read the Essential Question. Have them use prior knowledge and observations to try to answer the question. Remind students that they are not expected to know the answer to this question right now, but throughout the lesson they will learn more and be able to apply what they have learned to add to and revise their answer at the end of the lesson. You might want to record students' thoughts and questions about the Essential Question by using chart paper or the white board so they can reference them throughout the lesson.

Science and Engineering Practices:
I will *engage in argument from evidence.*

Have students read the "I will …" statement in the *Be a Scientist Notebook*. Throughout the lesson, students will engage in arguments about what happens to matter when it is cooled and heated. If this is the first time you are teaching the Science and Engineering Practice of engaging in argument from evidence, then explain that an argument is a discussion of opinions or different points of view.

ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What kind of argument could you engage in about the video? Sample answer: We could discuss what is happening to the glass as it is heated and how and why the glass changes.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do cooling and heating affect matter?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

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THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

- **Engage:** How will you access students' prior knowledge? How will you capture students' interest and get students' minds focused on the concept/topic? Strategy: Conduct paired conversations, provide simple hands-on experiments, allow students to draw ideas instead of writing.

Lesson 3: Temperature Changes Matter

Lesson 3: Day 1-Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

Create charts utilizing the essential question, phenomenon and Page Keeley probe:

- The Essential Question Chart must include students' questions and wondering about the EQ.
- Phenomenon Chart must include an image of the phenomenon and students' questions and comments.
- Page Keeley Probe chart must include an image of the probe along with the student's response. Students will revisit the probe later in the lesson to update their responses.

Assess Lesson Readiness:
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During the Lesson

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Phenomenon Science often begins when someone makes an observation about a situation or occurrence. Scientists refer to an event or situation that is observed or can be studied as a phenomenon. Spark your students' curiosity about the world by introducing the lesson phenomenon of an artist heating a glass ball. Play the video and ask students what questions they have about the artist heating the glass ball and have them record them ***in their Scientist Notebook***. If students are having trouble generating their own questions, then use the questions below to help guide a class discussion and get students thinking about what they saw and what they will learn in the lesson.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What did you see in the video?
- What did you notice about the artist heating the glass ball?
- What did you wonder about what you saw in the video?
- What interests you about the artist heating the glass ball?

Help students turn their observations from the video into questions that they can refer to during the lesson. Tell students that they do not need to be able to answer the questions that they generate right now. They will return to them later in the lesson.

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Reintroduce Career Kid Hannah, who wants to be a welder when she grows up.
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How do cooling and heating affect matter?
Have students read the Essential Question in their *Be A Scientist Notebook*. Have them use prior knowledge and observations to try to answer the question. Remind students that they are not expected to know the answer to this question right now, but throughout the lesson they will learn more and be able to apply what they have learned to add to and revise their answer at the end of the lesson. You might want to record students' thoughts and questions about the Essential Question by using chart paper or the white board so they can reference them throughout the lesson.

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ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What kind of argument could you engage in about the video?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do cooling and heating affect matter?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
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THE LESSON IN ACTION

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Lesson Opening

Explore: *What hands-on/minds-on common experience(s) will you provide for students?*

- *Strategies: Assign group roles for investigation, allow students to create demonstrations or models, create visual models to support each step of the investigation.*

Lesson 3: Temperature Changes Matter

Lesson 3: Days 2 &3 - Inquiry Activity; Heat and Ice and *Abe and Abby's Big Surprise*.

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential question with students as needed.

Inquiry Activity:
Heat and Ice
Students will observe an ice cube in cold water and an ice cube in warm water and contrast the two. They will also measure the temperature change of the water in each case. Students will find that the ice cube in the warm

water melted faster and that both the cold water and the warm water decreased in temperature because of the ice cube.
Read the steps of the investigation in their Scientist ***Notebook*** together with students.
Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions in their Scientist ***Notebook***. Then have students explain their predictions based on previous observations.

During the Lesson

Carry Out an Investigation

- If necessary, demonstrate for students how to take the temperature of a liquid. Remind students to keep the thermometer in the water for several seconds until the temperature reading is steady.
- Be sure students do not spill any of the water, as that may affect the results.

Have students complete the questions on pages in their science ***notebook.***

Talk About It:
Have students share their observations and data with their classmates.
ASK:
Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk. ***Wait Time***

- How do your results compare with those of your classmates?
- How does your prediction compare with your classmates' predictions? Was your prediction correct?
- How can heat change ice?

Abe and Abby's Big Surprise:
Have students read the ***Science Paired Read Aloud***. Students will learn how temperature affects water. While reading, students will encounter the vocabulary words: *temperature, melt, cool,* and *freeze*.

- What surprise do Abe and Abby make?
- What happens to the surprise overnight?
- Why does this change happen to the tank overnight?
- How did they fix the problem?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do cooling and heating affect matter?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
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THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explain: *How will you help students connect their exploration to the concept/topic under investigation?*

- *Strategies: Provide varied reading materials, utilize small group instruction, provide additional reading strategies and explanation of text.*
- **Lesson 3: Temperature Changes Matter**

Lesson 3: Day 4: Obtain and communicate Information, Reflect and Refine and SEP

Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices

- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

Obtain and Communicate Information:

Vocabulary

Read the vocabulary words listed aloud. Have students circle vocabulary words that they have heard before. Using the teacher presentation slide, display the words and their definitions. You might want to have students add the words to a word wall so they can reference them as they move through the lesson. Explain to students that they will see the words used in the content that they will be learning.

temperature how hot or cold something is
thermometer a tool that measures temperature
evaporate to change from a liquid to a gas
condense to change from a gas to a liquid
freeze to change from a liquid to a solid
heat a kind of energy that makes objects warmer
melt to change from a solid to a liquid
cool to make less hot
burn a way of changing matter using heat
Students should have encountered the following words in their previous learning: *matter*, *physical change*, and *chemical change*. Make sure students understand what these words mean before continuing in the lesson.

During the Lesson

Matter, Temperature, and Change:
Have students read pages in the ***Science Paired Read Aloud***. Students will learn how temperature changes matter through heating and cooling. While reading, students will encounter the vocabulary words: *temperature, thermometer, evaporate, condense, freeze, heat, melt, burn,* and *cool*.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What causes water droplets to form on the outside of a cold glass of tea? Water vapor in the warm air touches the cool glass and condenses. The water vapor changes to a liquid. The liquid appears as water droplets on the outside of the glass.
- What happens to water when it evaporates? Water changes into a gas called water vapor, which goes into the air.
- What happens to matter when there is too much heat? The heat can cause the matter to burn.

Using the leveled Readers:

Make a Pizza

This book serves as an extension of how heating changes matter, especially in cooking. Help students understand that making a pizza includes both physical and chemical changes.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do cooling and heating affect matter?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?

- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
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THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Explain: *How will you help students connect their exploration to the concept/topic under investigation?*

- *Strategies: Provide varied reading materials, utilize small group instruction, provide additional reading strategies and explanation of text.*
- **Lesson 3: Temperature Changes Matter**

Lesson 3: Day 5: Obtain and communicate Information, Reflect and Refine and SEP

Engagement Strategies:Whole Group- Small Group -Modeling -Guided Practices

- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

Visual Kinesthetic Vocabulary:

Have students cut out and fill in the Dinah Zike Visual Kinesthetic Vocabulary from pages VKV295–VKV296, VKV297–298, and VKV301–VKV302.

Use pages VKV295–VKV296 to help students describe what melting and freezing are and how they are related to heat. Then have students describe how these terms are connected to cooling and burning. Explain that the words *melt, freeze, cool,* and *burn* all have to do with the gaining or losing of heat.
On pages VKV297–VKV298, invite students to distinguish between the words *condense* and *evaporate*.
On pages VKV301–VKV302, have students compare and contrast the digital and mercury thermometers pictured. Discuss the relationship between the words *thermometer* and *temperature*.

During the Lesson

Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk. ***Wait Time***

Change It Simulation:
Students will explore how temperature can change matter and which of those changes can be reversed.

Have students read the popup introduction, and then click OK. Students should select a material to study. Then they may select *Heat* or *Cool* in any order to observe the changes. Students may want to select *Heat* and *Cool* in a different order, as well as multiple times, for each material as the results may vary. Encourage students to experiment with several different materials.
On a separate piece of paper, have students draw a three-column table in which to record their data. Have students label the first column *Material*, the second column *Heat/Cool,* and the third column *Observations*. Students will need several rows below these labels, one row for each run of the simulation. In the first column, students should list the material they have chosen to test. In the second column, students should indicate whether they heated or cooled the material. Then in the third column, students should draw or write what happened to the material when heated or cooled. When students have filled in their data tables, have them glue their tables onto in their ***Scientist Notebook***.

Crosscutting Concepts- Cause and Effect:
If this is the first time you have taught the **Crosscutting Concept** of cause and effect, explain that an effect is what happens, and a cause is why it happens.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- Suppose you see a partially melted chocolate bar on a picnic table on a sunny day. What could have caused it?

Have students answer questions in their ***Scientist Notebook***.

Changes in Matter Video:
Have students watch the video *Changes in Matter* to explore how temperature can change matter.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What happens to water when it is cooled?
- What happens to the ice when it is heated?

Have students complete the questions in their ***Scientist Notebook***.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do cooling and heating affect matter?**
- Update any additional questions to your Interactive Science Wall.

- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?
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THE LESSON IN ACTION

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Lesson Opening

Explain: *How will you help students connect their exploration to the concept/topic under investigation?*

- *Strategies: Provide varied reading materials, utilize small group instruction, provide additional reading strategies and explanation of text.*
- **Lesson 3: Temperature Changes Matter**

Lesson 3: Day 6: Obtain and communicate Information, Reflect and Refine and SEP

- **Engagement Strategies:Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**

- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criterias**, phenomenon & essential questions with students as needed.

Temperature Changes Matter Science File:
Have students read the *Temperature Changes Matter* Science File to learn more about how temperature causes matter to change. While reading, students will encounter the vocabulary words: *temperature, heat, burn, melt, evaporate, condense, cool,* and *freeze*.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- What happens to matter when it goes through a chemical change?
- Name two examples of heating causing a chemical change.
- What can cause matter to change state?
- What does freezing mean?

Have students complete the questions in their ***Scientist Notebook***.

During the Lesson

Quick Check:
Use this opportunity to do a quick assessment to determine if students are ready to move on. Display the Quick Check slide from the teacher presentation and
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- **Cause and Effect** What are some changes caused by heating matter? What are some changes caused by cooling matter?

Complete the graphic organizers as a class. If students were not able to explain the effect of heating or cooling on matter, then have them rewatch the video *Changes* in *Matter*.

Reflect and Refine:
Melted Butter
At this point, students can go back to the Page Keeley Science Probe in their ***Scientist Notebook*** to decide whether they would like to change or justify their response. Students have had an opportunity to develop a conceptual understanding of how heating or cooling changes matter. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

Science and Engineering Practices:
I can *engage in arguments from evidence.*
Have students complete the "I can …" statement. The "I can …" statement for this lesson references the **Science and Engineering Practice** of engaging in argument from evidence.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did you engage in arguments?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do cooling and heating affect matter?**
- Update any additional questions to your Interactive Science Wall.

- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

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Lesson Opening

Elaborate: *How will students apply their learning and develop a more sophisticated understanding of the concept/topic?*

- Strategies: Allow choice for activities that provide varying levels of complexity and hands-on opportunities, allow students to respond with labeled pictures and illustrations.
- **Lesson 3: Temperature Changes Matter**

Lesson 3: Day 7 - Research, Investigate, and Communicate: Inquiry Activity: YOU Change It.

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an**

opportunity for all students to be successful at the start of the lesson. Do Now TIPS

- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

Research, Investigate, and Communicate:
Inquiry Activity- YOU Change It
Students will choose an object to heat in a microwave oven and cool in a freezer. They will record their observations and determine if the change is reversible.
Read the steps of the investigation together with students.

During the Lesson

Carry Out an Investigation

1. You may wish to have more than one student pair test an object so that different pairs can compare results.
2. **Ask a Question** Help students ask a question that they will answer in the investigation. Asking questions is a science practice that drives every investigation. Then have students explain how their question will be answered in the investigation.
3. Brainstorm with students what steps they should take to test their objects. As they learned earlier in the lesson, the order in which they heat or cool the object may affect the results. Students should consider how long they will need to heat or cool the object. Guide students to appropriate durations of heating and cooling. Objects placed in the freezer will likely need more time to see a change compared to the microwave oven. Monitor students' use of the microwave and freezer.

Have students answer the question in their ***Scientist Notebook***.

Talk About It
Have students share their observations from the activity YOU Change It.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did your results compare to your classmates' results? Accept all reasonable answers based on objects selected by students. Some objects, such as marshmallows or gummy bears, may have melted when heated in the microwave and become solid when frozen. Other items, such as the bread and perhaps some non-food items, will not have changed much with heating or cooling.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do cooling and heating affect matter?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
- What was the most challenging part of today's lesson? Why?

- Can you make any connections from what you learned in today's lesson to what you've learned yesterday and tomorrow? Explain

Online Learning Activities:

- Work collaboratively –Live polling, backchannel, and collaborative note taking are useful activities that don't require students to leave their physical or virtual seats. Please utilize some of the following- Breakout room, Padlet, Jamboard, Popplet Lite, Mindomo, Edpuzzle, Discovery Education Virtual field trips, McGraw Hill Digital resources and Investigations.
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- Develop self-assessment and peer assessment skills – Online assessment tools facilitate ease in giving and receiving feedback. Assignments can be posted to Google classroom, and students can post instant responses or email their feedback.

THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Elaborate: *How will students apply their learning and develop a more sophisticated understanding of the concept/topic?*

- Strategies: Allow choice for activities that provide varying levels of complexity and hands-on opportunities, allow students to respond with labeled pictures and illustrations.
  - **Lesson 3: Temperature Changes Matter**

Lesson 3: Day 8 - Research, Investigate, and Communicate: Inquiry Activity: YOU Change It.

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed.

Performance Task:
Draw the Sequence

Students will draw how they think butter will change when heated by the Sun and when cooled at night. They will make three drawings of the butter: at the start, during the day, and at night. Students should draw, respectively, a stick of butter, a puddle of butter, and then the puddle of butter but solid.
Read the steps of the investigation together with students.
Make a Prediction Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions in their ***Scientist Notebook***. Then have students explain their predictions based on previous observations.

During the Lesson

Make a Model

1. Demonstrate for students how to fold a piece of paper into thirds.
2. Explain that in this activity, students will start with a stick of butter, rather than another form of butter, such as in a tub. If students are unfamiliar with a stick of butter, show them one. Ask students to imagine the butter on a plate. Invite students to label each section of the paper and label their drawings.

Talk About It:
Have students share their observations from the activity Draw the Sequence.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did your drawings compare to your classmates' drawings?
- Did your drawings match your prediction? What about your classmates?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do cooling and heating affect matter?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
- What question popped into your head during today's session? Is there something further you would like to know?
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Read the steps of the investigation on page 96 in the ***Be a Scientist Notebook*** together with students.
Make a Prediction Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Tell them to write their predictions on page 96 in the ***Be a Scientist Notebook***. Then have students explain their predictions based on previous observations.

During the Lesson

Make a Model

1 Demonstrate for students how to fold a piece of paper into thirds.

2 Explain that in this activity, students will start with a stick of butter, rather than another form of butter, such as in a tub. If students are unfamiliar with a stick of butter, show them one. Ask students to imagine the butter on a plate. Invite students to label each section of the paper and label their drawings.

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Have students share their observations from the activity Draw the Sequence.
ASK: *Utilize Think, Pair and Share or Turn and Talk strategies, Accountable Talk.* ***Wait Time***

- How did your drawings compare to your classmates' drawings?
- Did your drawings match your prediction? What about your classmates?

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do cooling and heating affect matter?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

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THE LESSON IN ACTION

Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.

Lesson Opening

Evaluate: *How will students demonstrate their mastery of the learning objective(s)?*

- *Strategies: Utilize choice boards, make assessment accommodations, modify test items.*
- **Lesson 3: Temperature Changes Matter**

Lesson 3: Days 9 & 10 :Performance Task & Project, eAssessment.

- **Engagement Strategies: Whole Group- Small Group -Modeling -Guided Practices**
- ➢ **Implement: Work Stations-Maker Space-Choice Boards**
- **Do It Now in Science: Do Now is to quickly engage students in learning and provide an opportunity for all students to be successful at the start of the lesson. Do Now TIPS**
- **Launch Presentation:** Share and discuss **Learning Intentions**, **Success Criteria**, phenomenon & essential questions with students as needed

Essential Question:

How do cooling and heating affect matter?
Have students refer to the answers you recorded at the beginning of the lesson and see if and how their thinking has changed. Discuss and share their answers as a large group. Have students answer the Essential Question on page 97 in the ***Be a Scientist Notebook***.

During the Lesson

Science and Engineering Practices:
I did *engage in argument from evidence.*
Have the students refer to the "I will …" and "I can …" statements on pages 87 and 93 in the ***Be a Scientist Notebook***.
ASK:

- How would you rate your ability to engage in argument from evidence? Color in the number of stars that tell how well you did.

eAssessment:
You might want to assign students the lesson test from eAssessment. You can assign the premade lesson test, which is based on the **Disciplinary Core Ideas** for the lesson, or you can customize a test using the customization tool. For additional help with eAssessment, please reference the "How To" guide under Assessment in the main menu.

Module Wrap Up:
Performance Project
Design a Solution
Students will design a concrete mold that leads from the front of the school to the playground. They will first sketch their design solution and include the materials they will need. Then they will write the steps they would take to create their mold. Students will draw a frame made of wood into which they would pour the concrete for the sidewalk. Their procedure would include waiting for the concrete to physically change from a liquid to a solid and then removing the wooden mold.
Read the steps of the investigation on pages 98–99 in the *Be a Scientist Notebook* together with students.

Have students draw their design solution in the box on page 98 in the *Be a Scientist Notebook*.
Encourage them to include labels and brief descriptions in their sketches. Remind students to list the materials they think they would need to build their molds.
Have students write down the steps they would take to build their design on page 99 in the *Be a Scientist Notebook*. You may wish to move around the class and provide help to groups as they write their steps.

Lesson Closing

Whole group- Small Group- Turn and Talk- Think Pair Share- Independent work.

- Revisit the Essential Question: **How do cooling and heating affect matter?**
- Update any additional questions to your Interactive Science Wall.
- Review Learning Intention and Success Criteria

Complete Exit Tasks: *Possible Questions:*

- Is there a concept or skill that we went over today that you didn't understand?
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Lesson 3 Resources

- Melted Butter
- Be a Scientist Notebook Page 87
- Be a Scientist Notebook Pages 88-89
- Be a Scientist Notebook Pages 90-91
- Be a Scientist Notebook Pages 91-92
- Be a Scientist Notebook Pages 94-95
- Be a Scientist Notebook Page 96

Module: Plants and Their Needs

<table>
<tr><th colspan="3">Stage 1 – Desired Results</th></tr>
<tr><td rowspan="2">ASSESSED FOCUS STANDARDS:
LS2.A.1: Interdependent Relationships in Ecosystems

• Plants depend on water and light to grow.

LS2.A.2: Interdependent Relationships in Ecosystems
• Plants depend on animals for pollination or to move their seeds around.

Primary NJSLS ELA/Literacy Connections:

RI.2.1 Ask and answer such questions as who, what, where, why, and how to demonstrate understanding of key details in a text.

W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations)

Primary NJSLS Mathematics Connections:</td><td colspan="2">Unit Description
Anchoring Phenomenon
 

Statement: Plants have specific needs in order to survive.
Observation/Demonstration/Experience: Photo of a garden.
Driving Question: Why do plants need water and light?</td></tr>
<tr><td colspan="2">Meaning</td></tr>
<tr><td>ENDURING UNDERSTANDINGS
• All organisms use energy to carry out the functions of life. Almost all of this energy comes, directly or indirectly, from the Sun.
• Plants use light energy from the Sun to make sugar through the process of photosynthesis.
• Other organisms eat plants for food.</td><td>ESSENTIAL QUESTIONS
Lesson 1:Why do plants need water?
Lesson 2:Why do plants need light?
Lesson 3: How do plants get help making new plants?</td></tr>
</table>

2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems.	• Most living things on Earth—including humans—depend on plant interactions with light for life. • Roots anchor a plant in the soil, absorb water, oxygen, and minerals, and store organic materials. • There are two types of root systems. A taproot system has a main large root, with smaller roots branching off from it (like a carrot). A diffuse root system has numerous slender roots with even smaller roots branching off from them (like a common house plant). • Roots are covered with many tiny growths called root hairs, which increase the surface area, helping the roots to absorb water and minerals. • Plants have different ways to reproduce. Flowering plants reproduce sexually by producing flowers and seed-containing fruits. Plants with cones, such as pine trees, also have seeds but lack flowers. Mosses and ferns do not have flowers, fruits, or seeds; instead, they make new plants by producing spores. • Plants can also reproduce asexually when plant fragments break off and	

	form new individuals or when a plant produces offshoots, or runners, which are clones of the parent plant.	
	What students will know and be able to do	
	KNOWLEDGE **Lesson 1:** I can explain why plants need water to survive. **Lesson 2:** I can conduct an investigation to determine how light affects a plant's growth. **Lesson 3:** I can develop a model to show how plants get help making new plants.	**SKILLS** **2-LS2-1** **Plan and conduct an investigation to determine if plants need sunlight and water to grow.** **[*Assessment Boundary: Assessment is limited to testing one variable at a time.*]** **Planning and Carrying Out Investigations;Cause and Effect** **2-LS2-2:** **Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*** **Developing and Using Models; Structure and Function**

Stage 2 – Evidence

SUMMATIVE ASSESSMENT(S)

Lesson 1:
Performance Task: Draw a Picture of a Flowering Plant
Performance Task Rubrics
Lesson 2:
Performance Task: What do you still wonder about plants?
What Do you still wonder about plants? Rubric
Lesson 3:
Performance Task: Make a model of a seed
Make a model of a seed: Rubric
Performance Project: Plants in your area
Performance Project: Plants in your area. Rubric
Module 6 Plants and Their Needs:Assessments

STEM Gauge K-2

Claim Evidence Reasoning (Evidence Based Writing)

PRE-ASSESSMENT

Page Keeley Probe

Lesson 1
Do All Plants Need Water?
Lesson 2
Do All Plants Need Light?
Lesson 3
Making More Plants

Integration of 21st Century Skills	Integration of Technology	Career Education
9.4.2.CI.1: Demonstrate openness to new ideas and perspectives. **9.4.2.CI.2:** Demonstrate originality and inventiveness in work. **9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem. **9.4.2.CT.2:** Identify possible approaches and resources to execute a plan. **9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).	**Inspire Science** **Lesson 1:** STEM Career Landscape Architect STEM Career Entomologist Plants and their needs vocabulary Roots take in water Parts of a Plant Digital Interactive. **Lesson 2:** Owen: Entomologist Science Paired Read Aloud: Which way to sprout? Plants and their needs vocabulary How do plants make food? **Lesson 3:** Phenomenon-dandelion blowing Traveling seeds simulation Paired read aloud: Little Seed's Journey Plants and their needs vocabulary Seeds move from place to place Life cycle of a plant Discovery Education: Mystery Science: Lesson 1 Seed Dispersal How did a tree travel halfway around the world? Lesson 2 Water, Sunlight, & Plant Growth Could a plant survive without light? Lesson 3 Light, Leaves, & Competition Why do trees grow so tall? Lesson 4 Adaptations & Habitat Should you water a cactus? Lesson 5 Adaptations & Habitat Where do plants grow best?	**Landscape Architect** Introduce Career Kid Kayla, who wants to be a landscape architect when she grows up. A landscape architect studies plants and designs outdoor areas. **Entomologist** Introduce Career Kid Owen, who wants to be an entomologist when he grows up. An entomologist may study all the insects in an area or focus on just one kind.

Stage 3 – Learning Plan

UNIT VOCABULARY

germinate stem root dispersal	nutrient ineral flower leaves	seed seedling fruit pollen pollination

SUMMARY OF KEY LEARNING

Lesson 1: Plants Need Water

Lesson 1: Day 1 - Module Opener, Phenomenon, Vocabulary, STEM career connection,.

- **Learning Intention:**
  - I am learning that plants need food and water to live and grow.
  - I am learning that some types of landscape architects work with plants in habitats.
- **Success Criteria:**
  - I can ask questions about the phenomenon of a garden with different types of plants.
  - I can draw and write what I think plants need to grow.
- **Brief Overview of Lesson:**
  Students will engage in a real-world problem (phenomenon) about plants. Introduce the key vocabulary in their science notebook. Introducing career kid Kayla who wants to be a landscape architect.

Lesson 1: Day 2 - Phenomenon, Essential Question Science and Engineering Practice

- **Learning Intention:**
  - I am learning that plants need water to survive.
  - I am learning that an entomologist studies insects.
- **Success Criteria:**
  - I can ask questions related to why plants need water to survive.
  - I can ask questions about the phenomenon of a garden with different types of plants.
  - I can write and discuss the investigation question with my classmates.
- **Brief Overview of Lesson:**
  The probe is used to assess prior knowledge and uncover misconceptions that will drive lesson instruction. Spark your students' curiosity about the world by introducing the lesson phenomenon of a garden. Introduce Career Kid Owen, who wants to be an entomologist when he grows up.

Lesson 1: Day 3- Inquiry Activity: Seeds Needs.

- **Learning Intention:**
  - I am learning that seeds need water to grow.
  - I am learning that garden plants grow from seeds.
- **Success Criteria:**
  - I can record my observations of seeds in bags with and without water every day for 5 days.
  - I can draw and label pictures of the beans in the bags daily on a table.
  - I can explain why some of the seeds changed to my classmates.
- **Brief Overview of Lesson:**
  - Students will investigate to determine if a seed needs water to grow or not.

Lesson 1: Days 4-7 - Obtain and Communicate Information: Vocabulary, "The Parts of a plant"- Inquiry Activity: Do Plants need water to grow? "Roots take in water"-Quick Check and Reflect and Refine.

- **Learning Intention:**
  - I am learning that plants need water to continue growing.
  - I am learning that plant parts help it to live and grow.
  - I am learning that plant parts have different functions.
- **Success Criteria:**

- I can explain and identify two parts that help move water through a plant.
- I can write my prediction based on the following: Will a plant continue to grow if it is not watered?
- I can draw and label a model of how the plant looked at the beginning of the investigation.
- I can write what happened during the investigation,
- I can name two reasons why roots grow down into soil.

- **Brief Overview of Lesson:**
  Lesson vocabulary flower, stem, leaves, root germinate and leaves will be enhanced during this lesson. Students will explore the digital interactive "Parts of a plant" on how plant parts help a plant live and grow. Also, students will plan and carry out an investigation to find out if plants need water to continue growing.

Lesson 1: Day 8 - Research, Investigate and Communicate: Seeds Need Water

- **Learning Intention:**
  - I am learning that seeds germinate.
  - I am learning that plants can grow in a special water solution with nutrients.
- **Success Criteria:**
  - I can discuss with my classmates the first thing that we can see after a seed germinates.
  - I can explain how seeds germinate in hydroponics.
- **Brief Overview of Lesson:**
  Students will read "Seeds Need water" on what seeds need to grow into plants.

Lesson 1: Days 9 &10-Performance Task: *Draw a picture of a flowering plant* and eAssessment.

- **Learning Intention:**
  - I am learning that plants need water to survive.
- **Success Criteria:**
  - I can draw and label a flowering plant that has been watered.
  - I can draw, label and describe flowering plants that have not been watered.
  - I can complete evidence based writing using the CER framework. Guided by the following question: *Why do plants need water?*
  - I can discuss and share my claim with evidence based on the *EQ: Why do plants need water?*
  - I can demonstrate my learning by completing lesson one assessment.
- **Brief Overview of Lesson:** Students will draw before-and-after pictures to demonstrate their understanding that plants need water. Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: Why do plants need water? Students will see whether and how their thinking has changed. Students will complete lesson one assessment.

Lesson 2: Plants Need Light

Lesson 2: Day 1 -Page Keeley Probe Phenomenon, STEM career connection,

- **Learning Intention:**
  - I am learning that plants need light.
  - I am learning that an entomologist studies insects.
- **Success Criteria:**
  - I can ask questions related to why plants need light.
  - I can ask questions about the phenomenon of a plant in a glass container.
  - I can write and discuss my questions with my classmates.
  - I can explain why I think plants need light to survive.

- **Brief Overview of Lesson:**
  Use the lesson probe to assess prior knowledge and uncover misconceptions that will drive lesson instruction. Spark your students' curiosity about the world by introducing the lesson phenomenon of a plant in a glass container. Introduce Career Kid Owen, who wants to be an entomologist when he grows up.

Lesson 2: Day 2 - Inquiry Activity: Plants and Sunlight

- **Learning Intention:**
  - I am learning that plants need light energy to grow.
- **Success Criteria:**
  - I can make a prediction about what will happen to a plant without a week of sunlight.
  - I can draw a picture of the leaves that were covered in foil. Then draw a picture of the leaves that were not covered in foil.
  - I can compare and contrast my drawings with my classmates' drawings?
  - I can discuss how plant roots absorb nutrients but do not actually eat food.
- **Brief Overview of Lesson:**
  Students will investigate what happens to a plant after one week with no sunlight on its leaves. They will read pages 4-13 in the science paired read aloud (nonfiction) to learn about three seeds.

Lesson 2: Days 3-7 - Obtain and Communicate Information, How plants use their parts to Live and Grow, Inquiry Activity: How leaves help a plant get light, How do plants make food? Reflect and Refine, Science and Engineering Practices

- **Learning Intention:**
  - I am learning that plants use their parts to live and grow.
  - I am learning that the shape and size of a leaf affect how much light a plant can collect.
- **Success Criteria:**
  - I can explain what plants use to make food.
  - I can make a prediction about how the shape and size of a leaf helps plants collect sunlight.
  - I can draw a model of a leaf that gets the most sunlight.
  - I can choose the best vocabulary words to describe how plants make food.
  - I can explain to my classmates why a leaf is called the food factory.
- **Brief Overview of Lesson:**
  The lessons vocabulary flower, stem, leaves, root germinate and leaves will be enhanced during this lesson. Students will explore the digital interactive "How do plants make food" on the different parts of plants. Also, students will observe how the shape and size of a leaf affect how much light a plant can collect.

Using the Leveled Readers

What Would We Do Without Bees?

Summary This book discusses the role that bees play in nature, pollinating plants, and producing honey.

When to Use Use this book after the Explain section of Lesson 2. Identify the parts of the plant that are involved in the pollination process.

Lesson 2: Day 8 - Research, Investigate and Communicate: Plant care research

- **Learning Intention:**
  - I am learning that plant care is an important part of a plant's survival.
- **Success Criteria:**

- I can ask questions about how to care for plants.
- I can research how to care for plants.
- I can research and write down important information about my plants, such as needs and habita**t.**
- I can write an explanation of how to care for my plant.

- **Brief Overview of Lesson:**
  Students will conduct research on how to care for a plant in order to demonstrate understanding of the needs of plants.

Lesson 2: Days 9 &10-Performance Task: *What do you still wonder?* and eAssessment.

- **Learning Intention:**
  - I am learning that plants need water and sunlight.
- **Success Criteria:**
  - I can develop a list of questions that I still have about plants with my classmates.
  - I can create a list of steps I will take to investigate my questions about plants.
  - I can complete an evidence based writing using the CER framework using the following investigable question: Why do plants need light?
  - I can demonstrate my learning by completing lesson two assessment.

- **Brief Overview of Lesson:**
  Students will develop questions they still have about plants and plan an investigation that will help them answer their questions. Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: How can matter be arranged in different ways*?* Students will see whether and how their thinking has changed. Students will complete lesson one assessment.

Lesson 3: Plants Make More Plants

Lesson 3: Day 1 - Page Keeley Probe, Phenomenon, Essential Question, STEM career connection

- **Learning Intention:**
  - I am learning that plants get help making new plants.
  - I am learning that an entomologist studies insects.
- **Success Criteria:**
  - I can ask questions related to plants getting help making new plants.
  - I can ask questions about the phenomenon of a dandelion blowing.
  - I can write and discuss my questions with my classmates.
  - I can explain why I think plants get help making new plants.
- **Brief Overview of Lesson:**
  Use the lesson probe to assess prior knowledge and uncover misconceptions that will drive lesson instruction.
  Spark your students' curiosity about the world by introducing the lesson phenomenon of a dandelion blowing. Introduce Career Kid Owen, who wants to be an entomologist when he grows up.

Lesson 3: Day 2 -Inquiry Activity: Travel Seeds Simulation

- **Learning Intention:**
  - I am learning the different ways seeds travel.
- **Success Criteria:**
  - I can write my prediction as to how seeds of different plants travel.
  - I can explore the simulation by following the directions on the screen.
  - I can draw and label how the wind helps seeds travel,

- I can draw and label how animals help seeds travel.

- **Brief Overview of Lesson:**
  Students will investigate the ways seeds travel by conducting a simulation 'Traveling Seeds" They will observe how many types of plants grow with the help from wind or help from an animal. Students will read pages 4-13 in the Science Paired Read Aloud to find out about how one little seed traveled from one place to another in the woods.

Lesson 3: Days 3-7 - Obtain and Communicate Information; *Inquiry Activity- Get Connected*
Reflect and Refine, Science and Engineering Practices

- **Learning Intention:**
  - I am learning the life cycle of a plant.
  - I am learning that seeds travel.
  - I am learning that insects pollinate flowers.
- **Success Criteria:**
  - I can explain to my classmates why seeds must travel.
  - I can discuss with my teammates the part that flowers play in making new parts.
  - I create a model and write out the process of how pollination happens.
  - I can make a prediction about what will happen to pollen on my hands when I touch another flower.
  - I can create a model of how insects pollinate flowers.
  - I can explain how to identify if a flower has been pollinated.
- **Brief Overview of Lesson:**
  The lesson's vocabulary seed, seedlings, fruit, pollen, pollination, dispersal will be enhanced during this lesson. They will read to learn the different ways seeds travel and grow into new plants. Students will explore the digital interactive "Seeds move from place to place". They will watch a video on the "life cycle of a plant" Also, students will read and conduct an investigation on insect pollination.

Lesson 3: Day 8 - Research, Investigate and Communicate: Inquiry Activity: *Travel Seeds Simulation*

- **Learning Intention:**
  - I am learning that the structure and function of a seed allows it to be carried by wind or an animal.
- **Success Criteria:**
  - I can investigate the way seeds travel.
  - I can record my observation of how seeds types travel.
  - I can draw and label models of how the dandelion and the purple flower seeds travel.
- **Brief Overview of Lesson:**
  - Students will contrast two different types of seeds. They will revisit the *Traveling Seeds* simulation to observe the two different types of seeds up close. Students will learn that the structure of a seed helps determine whether it will be carried better by wind or animals.

Lesson 3: Days 9 &10-Performance Task: *Make a model of a seed*, Performance Project and eAssessment.

- **Learning Intention:**
  - I am learning that plants depend on animals to move their seeds around.
  - I am learning which plants grow best in my area.
- **Success Criteria:**
  - I can review a list of materials and predict which will work best to create a seed.
  - I can create a seed from art supplies provided by my teacher.
  - I can test different fabrics to see if they would stick to an animal.
  - I can draw and label a model of a seed sticking on a fabric to be dispersed.

- I can complete an evidence based writing using the CER framework: How do plants get help making new plants?
- I can demonstrate my learning by completing lesson three assessment.
- I can plant an investigation using three different types of plants to see which plants will grow best in my area.

- **Brief Overview of Lesson:** Students will develop and use a model of a seed. Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: How do plants get help making new plants? Students will see whether and how their thinking has changed. Students will complete lesson three assessment. Students will plan and carry out an investigation about what types of local plants grow best in their area.

Using the Leveled Readers: From Seed to Tree

Summary This book discusses how an apple tree grows from a seed.

When to Use Use this book at the end of Lesson 3 to review the needs of plants

CULTURALLY RESPONSIVE TEACHING in PRACTICE	**SOCIAL EMOTIONAL LEARNING in PRACTICE**
Plant a garden Seed Bombs and Slingshots National Geographic Citizen Science Projects	**Awareness of Self & Others : My Creative Strengths** Self-knowledge is the ability to understand one's own interests, feelings, weaknesses, and strengths, as well as learning and relating styles. Self-knowledge is the starting point for all social and emotional learning. In fact, self-knowledge influences all areas of SEL including self-management, social awareness, relationship skills, and responsible decision-making. **Self-knowledge** helps students to know when they are on the right path and are making decisions that are aligned with who they are. It also can serve as a guide when students are going against their own strengths, styles, personalities, and purpose and help students re-align with who they are. The more a student understands him or herself, the better he or she will grow and adapt in all areas of life. **Self-Management:**Focus First! -Students will identify distractions and advocate for themselves in order to focus better in class. **Self-Management:**If at First You Don't Succeed...

	Students will practice strategies for persistence. **Self-Management:** Reach Your Goal-Students will identify a personal goal and the steps to achieve it. **Self-Management:** You Can Change It! Students will learn strategies for changing feelings, thoughts, and behaviors in stressful situations. **Self-Care:** I Believe in Me! Students will develop strategies for building belief to reach a goal**.** Self-efficacy is the belief in oneself. A student's self-efficacy greatly influences his or her academic motivation, learning, and achievement. Therefore, it is imperative that teachers address students' self-efficacy. Going-beyond-how-are-you-feeling This article focuses on:When students have the language to describe their feelings and needs, they are better equipped to help themselves and each other. Edutopia.org-Article/helping-students-process-their-feelings-during-remote-learning Why is it Important to Accept Others?

Lesson 1:	**Plants need water.**	**Estimated Time: 10 days**

Brief Overview of Lesson: This lesson focuses on the concept that plants need water to survive, beginning with the plants in a garden, and highlights the entomologist STEM career. By the end of the lesson, students will draw and label the important parts of a plant.

What students should know and be able to do to engage in this lesson:

- Students will explore the phenomenon of a garden by formulating questions to investigate throughout the lesson.

- Students will discuss the basic needs of what a plant needs to survive by exploring the career of an entomologist.
- Students will determine if a seed needs water to grow or not by conducting an investigation.
- Students will determine if a seed needs water to grow or not by conducting an investigation.
- Students will find out if plants need water to continue growing by planning and carrying out an investigation.
- Students will learn about the function of plant roots by watching the video *Roots Take In Water*.
- Students will learn how plants germinate, or begin to grow, in soil by reading and discussing the *Seeds Need Water* Science File.
- Students will demonstrate their understanding by drawing before-and-after pictures of plants needing water.
- Students will compare and contrast their labeled drawings with their classmates.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
LS2.A: Interdependent Relationships in Ecosystems • Plants depend on water and light to grow. **LS2.A: Interdependent Relationships in Ecosystems** • Plants depend on animals for pollination or to move their seeds around.	PK: 5.3.2: Observe similarities and differences in the needs of living things, and differences between living and nonliving things (e.g., observing and discussing similarities between animal babies and their parents; discussing the differences between a living thing, such as a hermit crab, and a nonliving thing, such as a shell).

Focus Question for this Lesson

Why do plants need water?

Learning Intention	**Success Criteria**
Day 1: • I am learning that plants need food and water to live and grow. • I am learning that some types of landscape architects work with plants in habitats. **Day 2:** • I am learning that plants need water to survive. • I am learning that an entomologist studies insects. **Day 3:** • I am learning that seeds need water to grow. • I am learning that garden plants grow from seeds. **Days 4-7:** • I am learning that plants need water to continue growing.	**Day 1:** • I can ask questions about the phenomenon of a garden with different types of plants. • I can draw and write what I think plants need to grow. **Day 2:** • I can ask questions related to why plants need water to survive. • I can ask questions about the phenomenon of a garden with different types of plants. • I can write and discuss the investigation question with my question with my classmates. **Day 3:** • I can record my observations of seeds in bags with and without water every day for 5 days.

● I am learning that plant parts help it to live and grow. ● I am learning that plant parts have different functions. **Day 8:** ● I am learning that when a seed is planted it can germinate. ● I am learning that you can grow plants in a special water solution with nutrients. **Days 9 &10:** ● I am learning that plants need water to survive.	● I can draw and label pictures of the beans in the bags daily on a table. ● I can explain why some of the seeds changed to my classmates. **Days 4-7:** ● I can explain and identify two parts that help move water through a plant. ● I can write my prediction based on the following: Will a plant continue to grow if it is not watered? ● I can draw and label a model of how the plant looked at the beginning of the investigation. ● I can write what happened during the investigation, ● I can name two reasons why roots grow down into soil. **Day 8:** ● I can discuss with my classmates the first thing that we can see after a seed germinates. ● I can explain how seeds germinate in hydroponics. **Days 9 &10:** ● I can draw and label a flowering plant that has been watered. ● I can draw, label and describe flowering plants that have not been watered. ● I can complete evidence based writing using the CER framework. Guided by the following question: *Why do plants need water?* ● I can discuss and share how my thinking has changed about the *EQ: Why do plants need water?* ● I can demonstrate my learning by completing lesson one assessment.
Assessment(s)	
Self-Assessment/Peer Assessment/Teacher Assessment	
Feedback (Peer to peer/student to teacher/teacher to student)	
● Student self-regulation or self-monitoring: Reflection sheet ● Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member ● Lesson Trackers: Students are motivated by recording and reflecting upon their progress.	

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS
Anticipated Student Pre-Conceptions/Misconceptions

Students may think that a plant's root system does not need oxygen. However, roots do need oxygen, which they get from the soil. Plants can die if they are overwatered or if the soil is too compact, because the roots are unable to get oxygen. Use a pencil to punch a hole in the bottom of two polystyrene foam cups. In one cup, loosely pour in a quarter cup of soil. Put a quarter cup of soil in the other cup, but pack it down tightly. Then pour water into each of the cups. Students will see that the water flows through the soil in the first cup more easily because the soil is not too compact**.**

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://wida.wisc.edu/teach/can-do/descriptors*

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level
- Encourage creativity and original thinking.
- Provide opportunities to make claims. **Claim Evidence Reasoning (Evidence Based Writing)**
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction

- Independent study
- Higher order thinking skills
- Adjusting the pace of lessons
- Interest based content
- Real world scenarios
- Student Driven Instruction

Lesson 2:	**Plants Need Light**	**Estimated Time: 10 days**

Brief Overview of Lesson:
The focus of this lesson is the concept that plants need light to survive. It also highlights the entomologist STEM career. Students will plan and carry out investigations to explore plants and light, including how leaves help a plant get light. By the end of the lesson, students will record any questions they may still have about a plant's needs.

What students should know and be able to do to engage in this lesson:

- **Day 1:** Students will explore the phenomenon of plants in a glass container by formulating questions to investigate throughout the lesson.
- **Day 2:** Students will examine what will happen to a plant after one week with no sunlight on its leaves by conducting an investigation.
- **Day 3:** Students will engage in a class discussion by read the *Science Paired* Read Aloud and learn about three seeds—Pumpkin, Pea, and Sunflower.
- **Day 4:** Students will review the parts of plants and how they are used by reading the *Science Paired Read Aloud* about what plants need.
- **Day 5:** Students will explain how the shape and size of a leaf affects how much light the leaf can take in by completing an investigation.
- **Day 6:** Students will demonstrate their understanding of how plants make food by exploring the *How Do Plants Make Food?* Digital Interactive.
- **Day 7:** Students will summarize why plants depend on light to grow by using key details in the text.
- **Day 8:** Students will demonstrate an understanding of the needs of plants by conducting research on how to care for a plant.
- **Day 9:** Students will develop questions they still have about plants and plan an investigation that will help them answer their questions.
- **Day 10:** Students will share and compare and contrast their results with their classmates.

LESSON FOUNDATION	
Assessed Standards for this lesson	**Important content not included in the standards**
LS2.A: Interdependent Relationships in Ecosystems • Plants depend on water and light to grow.	PK: 5.3.2: Observe similarities and differences in the needs of living things, and differences between living and

LS2.A: Interdependent Relationships in Ecosystems • Plants depend on animals for pollination or to move their seeds around.	nonliving things (e.g., observing and discussing similarities between animal babies and their parents; discussing the differences between a living thing, such as a hermit crab, and a nonliving thing, such as a shell)
Focus Question for this Lesson	
Why do plants need light?	
Learning Intention	**Success Criteria**
Day 1: ● I am learning that plants need light. ● I am learning that an entomologist studies insects. **Day 2:** ● I am learning that plants need light energy to grow. **Days 3-7:** ● I am learning that plants use their parts to live and grow. ● I am learning that the shape and size of a leaf affect how much light a plant can collect. **Day 8:** ● I am learning that plant care is an important part of a plant's survival. **Days 9&10:** ● I am learning that plants need water and sunlight.	**Day 1:** ● I can ask questions related to why plants need light. ● I can ask questions about the phenomenon of a plant in a glass container. ● I can write and discuss my questions with my classmates. ● I can explain why I think plants need light to survive. **Day 2:** ● I can make a prediction about what will happen to a plant without a week of sunlight. ● I can draw a picture of the leaves that were covered in foil. Then draw a picture of the leaves that were not covered in foil. ● I can compare and contrast my drawings with my classmates' drawings? ● I can discuss how plant roots absorb nutrients but do not actually eat food. **Days 3-7:** ● I can explain what plants use to make food. ● I can make a prediction about how the shape and size of a leaf helps plants collect sunlight. ● I can draw a model of a leaf that gets the most sunlight. ● I can choose the best vocabulary words to describe how plants make food. ● I can explain to my classmates why a leaf is called the food factory. **Day 8:** ● I can ask questions about how to care for plants. ● I can research how to care for plants. ● I can research and write down important information about my plants, such as needs and habita**t.**

	● I can write an explanation of how to care for my plant. **Days 9 & 10:** ● I can develop a list of questions that I still have about plants with my classmates. ● I can create a list of steps I will take to investigate my questions about plants. ● I can complete an evidence based writing using the CER framework using the following investigable question: Why do plants need light? ● I can demonstrate my learning by completing lesson two assessment.

Assessment(s)

Self-Assessment/Peer Assessment/Teacher Assessment

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

Students may think that all plants need bright sunlight to grow. But several varieties of plants, such as ferns, coleus, and hydrangeas, can grow in low light. These make good indoor plants or outdoor shade plants. Choose one of these plants and one plant that needs bright sunlight to grow. Place both plants in a shady part of the classroom. After a week, have students observe the condition of both plants.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://wida.wisc.edu/teach/can-do/descriptors*

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers

- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level
- Encourage creativity and original thinking.
- Provide opportunities to make claims. **Claim Evidence Reasoning** **(Evidence Based Writing)**
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios
  - Student Driven Instruction

Lesson 3:	**Plants Make More Plants**	**Estimated Time: 10 days**

Brief Overview of Lesson:

This lesson focuses on plant reproduction, beginning with a dandelion releasing its seeds in the wind. It also highlights the entomologist's STEM career. Students will develop and use models to show how plants get help making new plants, and how a seed is built for certain types of dispersal. By the end of the lesson, students will develop a model to demonstrate how an animal helps to disperse seeds.

What students should know and be able to do to engage in this lesson:

- Students will explore the phenomenon of a dandelion blowing by formulating questions that will be investigated throughout the lesson.
- Students will see different ways that seeds can travel by conducting an investigation.

- Students will learn about how one little seed traveled from one place to another in the woods by reading the *Science Paired Read Aloud*.
- Students will learn different ways seeds travel and grow into new plants by reading the *Science Paired Read Aloud*.
- Students will complete the *Seeds Move from Place to Place* Digital Interactive.
- Students will discuss the role of flowers and seeds in making new plants by watching the video *Life Cycle of a Plant*.
- Students will complete the *Pollination* Science File by making a Foldable book about the *Life Cycle of a Plant*.
- Students will learn how insects pollinate flowers by developing and using a model of a flower.
- Students will contrast two different types of seeds by using a graphic organizer.
- Students will use a model of a seed by developing their own model.
- Students will compare and contrast their models with their classmates.
- Students will demonstrate what types of local plants grow best in their area by planning and carrying out an investigation.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
LS2.A: Interdependent Relationships in Ecosystems • Plants depend on water and light to grow. **LS2.A: Interdependent Relationships in Ecosystems** • Plants depend on animals for pollination or to move their seeds around.	PK: 5.3.2: Observe similarities and differences in the needs of living things, and differences between living and nonliving things (e.g., observing and discussing similarities between animal babies and their parents; discussing the differences between a living thing, such as a hermit crab, and a nonliving thing, such as a shell)

Focus Question for this Lesson

How do plants get help making new plants?

Learning Intention	**Success Criteria**
Day 1: • I am learning that plants get help making new plants. • I am learning that an entomologist studies insects **Day 2:** • I am learning the different ways seeds travel. **Days 3-7:** • I am learning the life cycle of a plant. • I am learning that seeds travel. • I am learning that insects pollinate flowers. **Day 8:**	**Day 1:** • I can ask questions related to plants getting help making new plants. • I can ask questions about the phenomenon of a dandelion blowing. • I can write and discuss my questions with my classmates. • I can explain why I think plants get help making new plants. **Day 2:** • I can write my prediction as to how seeds of different plants travel. • I can explore the simulation by following the directions on the screen.

<table>
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- I am learning that the structure and function of a seed allows it to be carried by wind or an animal.

Days 9 & 10:

- I am learning that plants depend on animals to move their seeds around.
- I am learning which plants grow best in my area.

</td>
<td>

- I can draw and label how the wind helps seeds travel,
- I can draw and label how animals help seeds travel.

Day 3-7:

- I can explain to my classmates why seeds must travel.
- I can discuss with my teammates the part that flowers play in making new parts.
- I create a model and write out the process of how pollination happens.
- I can make a prediction about what will happen to pollen on my hands when I touch another flower.
- I can create a model of how insects pollinate flowers.
- I can explain how to identify if a flower has been pollinated.

Day 8:

- I can investigate the way seeds travel.
- I can record my observation of how seeds types travel.
- I can draw and label models of how the dandelion and the purple flower seeds travel.

Days 9-10:

- I can review a list of materials and predict which will work best to create a seed.
- I can create a seed from art supplies provided by my teacher.
- I can test different fabrics to see if they would stick to an animal.
- I can draw and label a model of a seed sticking on a fabric to be dispersed.
- I can complete an evidence based writing using the CER framework: How do plants get help making new plants?
- I can demonstrate my learning by completing lesson three assessment.
- I can plant an investigation using three different types of plants to see which plants will grow best in my area.

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<tr><td colspan="2">Assessment(s)</td></tr>
<tr><td colspan="2">Self-Assessment/Peer Assessment/Teacher Assessment</td></tr>
<tr><td colspan="2">Feedback (Peer to peer/student to teacher/teacher to student)</td></tr>
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- Student self-regulation or self-monitoring: Reflection sheet

</td></tr>
</table>

- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

Students may think that all plants reproduce by forming flowers and seeds. However, some plants have other ways of reproducing. Mosses and ferns, for example, do not have seeds, but instead produce microscopic spores that fall to earth and give rise to new individuals. Conifers, such as pine trees, lack flowers but produce seeds in cone-like structures. Many plants also reproduce by forming new individuals that arise as runners or offshoots from a parent plant.

Integrated Accommodations & Modifications

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- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios
  - Student Driven Instruction

Module: Living Things in Habitats

<table>
<tr><th colspan="3">Stage 1 – Desired Results</th></tr>
<tr><td rowspan="3">ASSESSED FOCUS STANDARDS:
LS4.D: Biodiversity and Humans
• There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)

Primary NJSLS ELA/Literacy Connections:
RI.1.1 Ask and answer questions about key details in a text.

RI.2.1 Ask and answer questions such as who, what, where, why, and how to demonstrate understanding about key details in a text.

W.1.7 Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions).</td><td colspan="2">Unit Description
Anchoring Phenomenon
 
Statement: Living things live in habitats.
Observation/Demonstration/Experience: Photo of the rainforest.
Driving Question: What is a habitat?</td></tr>
<tr><td colspan="2">Meaning</td></tr>
<tr><td>ENDURING UNDERSTANDINGS
• An ecosystem, whether small or large, is a complex system of living and nonliving things that interact.
• A habitat is a place where plants and animals live -</td><td>ESSENTIAL QUESTIONS
Lesson 1: What is a habitat?
Lesson 2: What lives in forests and grasslands?
Lesson 3: What lives in water habitats?
Lesson 4:What lives in hot and cold deserts?</td></tr>
</table>

W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. W.2.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). W.2.8 Recall information from experiences or gather information from provided sources to answer a question. **Primary NJSLS Mathematics Connections:** 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems.	forests, grassland, rainforest, etc. • Particular types of plants and animals distinguish each kind of habitat. • There are two main types of water habitats: saltwater and freshwater. • Freshwater habitats include rivers, lakes, and ponds. • Saltwater habitats include oceans, which cover nearly three-quarters of Earth's surface, and some l	
	What students will know and be able to do	
	KNOWLEDGE Lesson 1: I can design a habitat. Lesson 2: I can make observations to learn about forests and grasslands Lesson 3: I can make observations of the patterns in water habitats. Lesson 4: I can communicate information about what lives in hot and cold deserts.	**SKILLS** **2 LS4-1Make observations of plants and animals to compare the diversity of life in different habitats** [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] Planning and Carrying Out Investigations;Structure and Function

Stage 2 – Evidence

SUMMATIVE ASSESSMENT(S)

Lesson 1:
Performance Task Design a Habitat for Yourself
Lesson 1 Design a habitat for yourself rubric

Lesson 2:
Performance Task_ Animal Research Partner Activity
Animal Research Partner Activity Rubric

Lesson 3
Performance Task_ Animal Research Partner Activity
Performance Task_ Animal Research Partner Rubric

Lesson 4:
Lesson 4 Habitat Wrap-Up
Lesson 4 Habitat Wrap Up. Rubric
Performance Project_ Designer Habitat
Performance Project Designer Habitat. Rubric

STEM Gauge K-2

Claim Evidence Reasoning (Evidence Based Writing)

PRE-ASSESSMENT

Page Keeley Probe
Lesson 1:
Assess Lesson Readiness
Lesson 2:
Assess Lesson Readiness
Lesson 3:
Assess Lesson Readiness
Lesson 4:
Assess Lesson Readiness

Integration of 21st Century Skills	Integration of Technology	Career Education
9.4.2.CI.1: Demonstrate openness to new ideas and perspectives. **9.4.2.CI.2:** Demonstrate originality and inventiveness in work. **9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem. **9.4.2.CT.2:** Identify possible approaches and resources to execute a plan. **9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).	**Inspire Science** **Lesson 1** Second Grade Songs Living things in habitats vocabulary Read Aloud: Plants and animal habitats Habitats **Lesson 2** Living things in habitats Types of habitats **Lesson 3** Living things in habitats vocabulary Oceans and Ponds Coral Reefs **Lesson 4** Living things in habitats vocabulary Read aloud: Extreme habitats Cosmic pet pods game Desert habitats simulation Extreme habitats Discovery Education Introduction to habitats Forest habitats Desert and grassland habitats Mystery Science Adaptations & Habitat: Should you water a cactus?	**Park Ranger** Introduce Career Kid Poppy, who wants to be a park ranger when she grows up. Explain that park rangers have to know about habitats. Like Poppy, students will learn all about habitats too.

Stage 3 – Learning Plan

UNIT VOCABULARY

habitat predator prey	forest grassland ocean pond	desert Arctic

shelter	food chain	

SUMMARY OF KEY LEARNING

Lesson 1: Habitat

Lesson 1: Day 1 - Module Opener, Vocabulary, STEM career connection

- **Learning Intention:**
  - I am learning that different kinds of living things exist in different places.
- **Success Criteria:**
  - I can ask questions about the rainforest.
  - I can draw examples of a living thing in a rainforest.
- **Brief Overview of Lesson:**
  Students are engaged with the phenomenon of a photo of the rainforest. Students will be introduced to the module's vocabulary words. The STEM career of a veterinarian is introduced. Prompt students to ask questions about the career.

Lesson 1: Day 2 - Phenomenon, Essential Question Science and Engineering Practice

- **Learning Intention:**
  - I am learning where habitats are found.
- **Success Criteria:**
  - I can explain where I think habitats are found.
  - I can ask questions about my notices in a photo of a neighborhood.
  - I can ask questions based on the essential question: What is a habitat?
- **Brief Overview of Lesson:**
  This probe is intended to uncover students' basic ideas about the concept of a habitat. Use this probe to assess prior knowledge and uncover misconceptions that will drive lesson instruction. Spark your students' curiosity about the world by introducing the lesson phenomenon of a neighborhood. Introduce Career Kid Poppy, who wants to be a park ranger when she grows up. Explain that park rangers have to know about habitats.

Lesson 1: Days 3 & 4- Obtain and Communicate Information: Living Things in Habitats- *A Home for Maggie*

- **Learning Intention:**
  - I am learning where plants and animals live.
- **Success Criteria:**
  - I can make a prediction about where plants and animals live.
  - I can sort pictures of different kinds of plants and animals into groups.
  - I sort pictures of animals that live in hot or cold areas.
  - I can compare my sorted group with my classmates' groups.
  - I can read a fictional story about a barn swallow that flies to different habitats.
  - I can explain to my classmates why the swallow flies south.
- **Brief Overview of Lesson:**
  Students will sort pictures of plants and animals into different groups. Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future. Students will also read a fictional story, about a barn swallow named Maggie flies to different habitats until she finds the one that is just right for her.

Lesson 1: Days 5-7 - Obtain and Communicate Information: Plant and animals' habitats, Habitats and living things, Quick Check, Reflect and Refine.

- **Learning Intention:**

- I am learning that living things survive and grow in places that give them what they need to stay alive.

- **Success Criteria:**
  - I can explain why a plant that lives in a dry habitat cannot live in a wet habitat.
  - I can discuss how some animals use plants as shelter and food to my classmates.
  - I can compare and contrast water habitats using a Venn diagram.
  - I can create a list of habitats and describe one of their key features.
  - I can complete the summarizing graphic organizer about animal and plant needs.
  - I can revisit the Page Keeley Probe to decide whether I need to change or justify my response.
- **Brief Overview of Lesson**
  - Students will read, watch videos and engage with a digital interactive about how plants and animals get what they need from their habitats. Students will continue to develop and engage with the lesson vocabulary

Lesson 1: Day 8 - Research, Investigate and Communicate: Plants and animals depend on each other.

- **Learning Intention:**
  - I am learning that plants and animals depend on each other to survive.
  - **Success Criteria:**
  - I can complete and discuss a matching task using the lesson vocabulary.
  - I can discuss and explain with my classmates where plants get the energy to grow.
  - I can make a prediction about food chains.
  - I can create a food chain model and explain the order starting with the Sun.
  - I can compare my food chain with my classmates.
- **Brief Overview of Lesson:**
  - Students will read the Science file article and they will encounter the vocabulary works: habitat, predator, prey and food chain. They will also make a model of a food chain.

Lesson 1: Days 9 & 10-Performance Task: *Make a Model of a Landform* and eAssessment.

- **Learning Intention:**
  - I am learning that many different kinds of living things live in a specific area.
- **Success Criteria:**
  - I can make a prediction about what I need to survive in my habitat.
  - I can create a model of my personal habitat.
  - I can discuss and share my claim with evidence based on the *EQ:What is a habitat?*
  - I can demonstrate my learning by completing lesson one assessment.
- **Brief Overview of Lesson:** Students will design a model of a personal. Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: What is a habitat? Students will see whether and how their thinking has changed. Students will complete lesson one assessment.

Using the Leveled Readers:

Two Kinds of Forests

Guide the students in using the information in the book to fill out a Venn diagram before they choose two other habitats to compare.

Lesson 2: Forest and Grasslands

Lesson 2: Day 1 - Page Keeley Probe, Phenomenon, STEM Career and Essential Question

- **Learning Intention:**
  - I am learning that different animals live in forests and grasslands.

- **Success Criteria:**
    - I can discuss my ideas about the types of animals that live in forests and grasslands with my classmates.
    - I can ask questions and discuss the phenomenon of a forest with my group.
    - I can ask questions based on the essential question: What lives in forest and grasslands?
- **Brief Overview of Lesson:**
- Spark you students' curiosity about the world by introducing the lesson phenomenon of a forest. Reintroduce Career Kid Poppy, who wants to be a park ranger when she grows up. Remind students that part of a park ranger's job is to protect and supervise outdoor areas. Students will also be introduced to the essential question: What lives in forests and grasslands?

Lesson 2: Day 2 - Inquiry Activity: Pill Bug Habitats

- **Learning Intention:**
    - I am learning that different living things live in various habitats.
    - I am learning that animals are alike and different.
- **Success Criteria:**
    - I can make and discuss my predictions about what happens to a pill bug in its small habitat.
    - I can follow a step by step plan to construct a small model forest habitat.
    - I can write and draw my observations of the pill bug over a few days.
    - I can write and discuss how the pill bug gets what it needs to survive.
- **Brief Overview of Lesson:**
  Students follow a step-by-step plan to construct a small model forest habitat, observe what life is like in the habitat, and record their observations in a data table.

Lesson 2: Days 3-7 - Obtain and Communicate Information; *Types of habitats, Living things in habitats,* Inquiry Activity: *Living Things in a forest*

Learning Intention:

- I am learning that different living things live in various habitats.
- I am learning that habitats can change.

- **Success Criteria:**
    - I can draw and write about the following vocabulary words: forest and grasslands.
    - I can complete a table by listing the animals that live in each habitat.
    - I can plan and carry out an investigation to see what happens when you add an earthworm to your pill bug habitat.
    - I can make a prediction about how a bill bug and earthworm react in their forest habitat.
    - I can write the steps to complete my investigation.
    - I can draw and write observations of the earthworm and pill bug.
    - I can explain to my group why I think an earth worm would be an important animal in a forest.
- **Brief Overview of Lesson:**
  Students will plan an investigation to observe what happens when an earthworm is added to their pill bug habitat, and then they will carry out their investigation. Students will continue to develop and engage with the lesson vocabulary. Structure and function, help students understand that structure means how something is built or made, and function refers to a use, that is, what something does or how it works. Help students understand these terms by having them think about the roots of a plant.

Lesson 2: Day 8 - Research, Investigate and Communicate: Forest habitats

- **Learning Intention:**
    - I am learning the differences between a woodland forest, and a rainforest.
- **Success Criteria:**
    - I can discuss one way a woodland forest is different from a rainforest to my group.

- I can create a bar graph of the average rainfall in the Amazon Rainforest and White River National Forest.
- I can compare and contrast the rainfall amounts between the two forests to my classmates.

- **Brief Overview of Lesson:**
  Students will learn about two different habitats by reading a *forest habitat science file*. They will create a bar gar model based on the habitats rainfall amounts. Finally, students will compare rainfall amounts using the data shown in their graphs.

Lesson 2: Days 9 &10-Performance Task: Animal Research Partner Activity

- **Learning Intention**:
  - I am learning about grassland and forest habitat animals.
- **Success Criteria:**
  - I can select an animal to research and identify what specifically I would like to learn about the animal.
  - I can write about what my animal needs to survive in its habitat.
  - I can discuss and share my claim with evidence based on the *EQ:*What lives in forests and grasslands?
  - I can demonstrate my learning by completing lesson two assessment.
- **Brief Overview of Lesson:** Students will research animals of grassland and forest habitats and write using facts from their research. Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: What lives in forests and grasslands*?* Students will see whether and how their thinking has changed. Students will complete lesson two assessment.

Lesson 3: Water habitats?

Lesson 3: Day 1 -Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Learning Intention:**
  - I am learning that organisms that live in water need specific things to survive.
- **Success Criteria:**
  - I can identify and explain what an organism needs to survive in water.
  - I can discuss my ideas about the types of animals that live in a water habitat with my classmates.
  - I can ask questions and discuss the phenomenon of a water habitat with my group.
  - I can ask questions based on the essential question: What lives in a water habitat?
- **Brief Overview of Lesson:**
  This probe is intended to uncover students' basic ideas about water habitats. Spark you students' curiosity about the world by introducing the lesson phenomenon of a water habitat. Reintroduce Career Kid Poppy, who wants to be a park ranger when she grows up. Remind students that part of a park ranger's job is to protect and supervise outdoor areas. Students will also be introduced to the essential question: What lives in forests and grasslands?

Lesson 3: Day 2- Inquiry Activity: Brine Shrimp

- **Learning Intention:**
  - I am learning that there are two main types of water habitats: freshwater and saltwater.
- **Success Criteria:**
  - I can predict whether brine shrimp eggs will hatch in saltwater or freshwater.
  - I can record my observation of when the brine shrimp eggs hatched.
  - I can explain which water habitat the brine shrimp prefer with my classmates.
- **Brief Overview of Lesson:**

Students will make a habitat for brine shrimp. They will discuss the differences between saltwater and freshwater habitats

Lesson 3: Days 3-7 - Obtain and Communicate Information: Oceans and Ponds, Living things in oceans and ponds, Inquiry Activity: Floating Fish, Coral Reefs & Reflect and Refine, Science and Engineering Practices

- **Learning Intention:**
  - I am learning that ponds and oceans are home to a large variety of organisms.
  - I am learning that an ocean is a large body of saltwater.
  - I am learning that a pond is a small body of freshwater.
  - I am learning that coral reefs are a kind of ocean habitat.
- **Success Criteria:**
  - I can draw and write about the following vocabulary words: ocean and pond.
  - I can explain to my classmates what kinds of animals live in a pond.
  - I can compare and contrast the ocean and ponds.
  - I can identify plants in an ocean habitat.
  - I can describe how some plants are used in an ocean habitat.
  - I can compare at least three different ocean animals.
- **Brief Overview of Lesson:**
  Students will develop lesson vocabulary. They will read about one type of saltwater and freshwater habitat. Students will complete the Coral Reef Digital Interactive. Finally, they will explore the part of the fish's body that helps it survive in its water habitat.

Lesson 3: Day 8 - Research, Investigate and Communicate: River Habitats Science File

- **Learning Intention:**
  - I am learning that rivers are freshwater habitats.
  - I am learning about the living things in rivers.
- **Success Criteria:**
  - I can explain how rivers are different from lakes and ponds.
  - I can discuss and explain what functions tree roots and branches that grow down into a river serve?
- **Brief Overview of Lesson:**
  Have students read the *River Habitats* Science File. They will learn about rivers and some of the plants and animals that live there.

Lesson 3: Days 9 &10-Performance Task: *Animal Research Partner Activity* and eAssessment.

- **Learning Intention:**
  - I am learning about water habitats.
- **Success Criteria:**
  - I can research a water habitat and create a specific question to guide my research.
  - I can create a model of a water habitat.
  - I can identify specific plants for my habitat.
  - I can discuss and share my claim with evidence based on the *EQ:What lives in water habitats?*
  - I can demonstrate my learning by completing lesson three assessment.
- **Brief Overview of Lesson:** Students will research a water habitat and then create a model of it. Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: What lives in water habitats*?* Students will see whether and how their thinking has changed. Students will complete lesson one assessment.

Lesson 4: Hot and Cold Deserts

Lesson 4: Day 1 -Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Learning Intention:**

- I am learning about hot and cold deserts.

- **Success Criteria:**
  - I can discuss my ideas about the hot and cold deserts with my classmates.
  - I can ask questions and discuss the phenomenon of mountains with snow with my group.
  - I can ask questions based on the essential question: What lives in hot and cold deserts?
- **Brief Overview of Lesson:**
  This probe is intended to uncover students' basic ideas about deserts.
  Spark your students' curiosity about the world by introducing the lesson phenomenon of mountains and snow. Reintroduce Career Kid Poppy, who wants to be a park ranger when she grows up. Remind students that part of a park ranger's job is to protect and supervise outdoor areas. Students will also be introduced to the essential question: What lives in hot and cold deserts?

Lesson 4: Day 2 - Inquiry Activity: Desert Habitats simulation and The Dream Home

- **Learning Intention:**
  - I am learning about animals that live in both cold and hot desert habitats.
- **Success Criteria:**
  - I can make a prediction about how I think animals are able to live in cold deserts.
  - I can record my observations of animals in a hot desert during the day and night.
  - I can record my observation of animals in a cold desert during the summer and winter.
  - I can discuss and explain what most animals do in a hot desert during the middle of the day with my classmates.
  - I can read a story and answer questions about how animal's body parts and the source of food is related to their habitat.
- **Brief Overview of Lesson:**
  Students will observe how various animals survive in hot and cold desert habitats. Students will read pages 4–13 in the ***Science Paired Read Aloud***. This reading will help students begin to think about how an animal's body parts and food sources are related to the habitat where it lives.

Lesson 4: Days 3-7 - Obtain and Communicate Information: Extreme Habitats paired read aloud, Inquiry Activity: Plant Survival, Extreme Habitats Video, Quick Check and Refine

- **Learning Intention:**
  - I am learning that plants and animals are able to live in extreme habitats.
- **Success Criteria:**
  - I can create a sentence and illustrate a picture of the vocabulary words: desert and Arctic.
  - I can explain how Arctic animals stay warm to my classmates.
  - I can plan and carry out an investigation about plants in a desert habitat.
  - I can draw and write about what I observed during the investigation.
  - I can discuss and explain to my classmates how a cactus is able to survive without water?
  - I can compare and contrast hot and cold desert with my classmates.
- **Brief Overview of Lesson:**
  - Lesson vocabulary desert and arctic will be enhanced during this lesson. Students will read about extreme habitats in the pair read aloud. They will plan and carry out an investigation about plants in a desert habitat. Complete the quick check and revisit Page Keeley probe.

Lesson 4: Day 8 - Research, Investigate and Communicate: Inquiry Activity: Animals in cold deserts.

- **Learning Intention:**
  - I am learning that animals have features that help them survive when it is very cold.
- **Success Criteria:**
  - I can predict whether hot water will stay warm in a foam cup or a regular cup.

- I can measure the temperature in each cup using a thermometer.
- I can record the temperature of each cup at 5 minutes intervals.
- I can explain to my classmates how and why which container kept the water warm longer.
- I can discuss with my classmates how and why Arctic animals stay warm in their cold habitat.
- I can design a habitat for mystery animals.

- **Brief Overview of Lesson:**
  - Students will investigate how animals stay warm in cold habitats.

Lesson 4: Days 9 & 10-Performance Task: *Habitat* and eAssessment.

- **Learning Intention:**
  - I am learning that there are many different kinds of living things in different habitats.
- **Success Crite**ria:
  - I am learning that there are many different kinds of living things in different habitats.
- **Brief Overview of Lesson:** Students will demonstrate what they learned about hot and cold deserts. Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: What lives in hot and cold deserts*?* Students will see whether and how their thinking has changed. Students will complete lesson one assessment. Performance project: Students will analyze the needs of a mystery animal to design a habitat for it.

Using the Leveled Readers

Desert Life

Help students identify characteristics of a desert in the book and of some of the plants that live there.

CULTURALLY RESPONSIVE TEACHING in PRACTICE	**SOCIAL EMOTIONAL LEARNING in PRACTICE**
● ECO Girls —Plants and Animals ● National Park Service Continues To Grapple With Diversity In Workforce ● International Day of Women and Girls in Science | United Nations ● Dr. Ayana Elizabeth Johnson is a marine biologist ● Greenlatinos ● The green deserts of Nilgiris ● Weequahic Park ● Weequahic Park Lake.pdf	**Awareness of Self & Others: My Creative Strengths** Self-knowledge is the ability to understand one's own interests, feelings, weaknesses, and strengths, as well as learning and relating styles. Self-knowledge is the starting point for all social and emotional learning. In fact, self-knowledge influences all areas of SEL including self-management, social awareness, relationship skills, and responsible decision-making. **Self-knowledge** helps students to know when they are on the right path and are making decisions that are aligned with who they are. It also can serve as a guide when students are going against their own strengths, styles, personalities, and purpose and help students re-align with who they are. The more a student

	understands him or herself, the better he or she will grow and adapt in all areas of life. **Self-Management:**Focus First! -Students will identify distractions and advocate for themselves in order to focus better in class. **Self-Management:**If at First You Don't Succeed... Students will practice strategies for persistence. **Self-Management:** Reach Your Goal-Students will identify a personal goal and the steps to achieve it. **Self-Management:** You Can Change It! Students will learn strategies for changing feelings, thoughts, and behaviors in stressful situations. **Self-Care:** I Believe in Me! Students will develop strategies for building belief to reach a goal. Self-efficacy is the belief in oneself. A student's self-efficacy greatly influences his or her academic motivation, learning, and achievement. Therefore, it is imperative that teachers address students' self-efficacy. Going-beyond-how-are-you-feeling This article focuses on: When students have the language to describe their feelings and needs, they are better equipped to help themselves and each other. Edutopia.org-Article/helping-students-process-their-feelings-during-remote-learning Why is it Important to Accept Others?

Lesson 1	**Habitats**	**Estimated Time: 10 days**

Brief Overview of Lesson: This lesson focuses on the habitats and the living things that live in them, and highlights the park ranger STEM career. Students will plan and carry out investigations to determine where things live in a habitat, and to explore food chains. By the end of the lesson, students will be able to use observations to describe what habitats are and design their own habitat.

What students should know and be able to do to engage in this lesson:

- Students will explore the phenomenon of the rainforest by formulating questions that will be investigated throughout the lesson.
- Students will explain what a habitat is by investigating the career of a park ranger.
- Students will use pictures of plants and animals by sorting pictures in different ways.
- Students will explain how the character in the text was able to find the right habitat by using key details in the text.
- Students will define vocabulary words by reading about how plants and animals get what they need from their habitat.
- Students will watch the video *Habitats and Living Things* and explain their understanding by discussing it with their partners.
- Students will view different habitats and read details about each one by using the *Habitats* Digital Interactive.
- Students will read the *Plants and Animals Depend on Each Other* Science File and demonstrate their learning by using key details in the text.
- Students will demonstrate their understanding of the lesson by making a model of a habitat.
- Students will share their data from the Performance Task *Design a Habitat for Yourself* while comparing and contrasting their model with their classmate

LESSON FOUNDATION	
Assessed Standards for this lesson	**Important content not included in the standards**
LS4.D: Biodiversity and Humans • There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)	PK: 5.3.3 Observe and describe how natural habitats provide for the basic needs of plants and animals with respect to shelter, food, water, air, and light (e.g., digging outside in the soil to investigate the kinds of animal life that live in and around the ground or replicating a natural habitat in a classroom terrarium).
Focus Question for this Lesson	
What is a habitat?	
Learning Intention	**Success Criteria**
Day 1: • I am learning that different kinds of living things exist in different places. **Day 2:** • I am learning where habitats are found. **Days 3 & 4:**	**Day 1:** I can ask questions about the rainforest. I can draw examples of a living thing in a rainforest. **Day 2:** • I can explain where I think habitats are found.

● I am learning where plants and animals live. **Days 5-7:** ● I am learning that living things survive and grow in places that give them what they need to stay alive. **Day 8:** ● I am learning that plants and animals depend on each other to survive. **Days 9&10:** ● I am learning that many different kinds of living things live in a specific area.	● I can ask questions about my notices in a photo of a neighborhood. ● I can ask questions based on the essential question: What is a habitat? **Days 3 &4:** ● I can make a prediction about where plants and animals live. ● I can sort pictures of different kinds of plants and animals into groups. ● I sort pictures of animals that live in hot or cold areas. ● I can compare my sorted group with my classmates' groups. ● I can read a fictional story about a barn swallow that flies to different habitats. ● I can explain to my classmates why the swallow flies south **Days 5-7:** ● I can explain why a plant that lives in a dry habitat cannot live in a wet habitat. ● I can discuss how some animals use plants as shelter and food to my classmates. ● I can compare and contrast water habitats using a Venn diagram. ● I can create a list of habitats and describe one of their key features. ● I can complete the summarizing graphic organizer about animal and plant needs. ● I can revisit the Page Keeley Probe to decide whether I need to change or justify my response. **Day 8:** ● I can complete and discuss a matching task using the lesson vocabulary ● I can discuss and explain with my classmates where plants get the energy to grow. ● I can make a prediction about food chains. ● I can create a food chain model and explain the order starting with the Sun. ● I can compare my food chain with my classmates. **Days 9 & 10:** ● I can make a prediction about what I need to survive in my habitat. ● I can create a model of my personal habitat.

	• I can discuss and share my claim with evidence based on the *EQ:What is a habitat?* • I can demonstrate my learning by completing lesson one assessment.

Assessment(s)

Self-Assessment/Peer Assessment/Teacher Assessment

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

Students may think that habitats are only for animals. Many students may not recognize trees or other plants as living things. Plants, like animals, also have habitats. Students may also not understand that plants and animals share some basic needs—air, water, and space—to live.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://wida.wisc.edu/teach/can-do/descriptors*

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.

- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level
- Encourage creativity and original thinking.
- Provide opportunities to make claims. **Claim Evidence Reasoning** **(Evidence Based Writing)**
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios
  - Student Driven Instruction

Lesson 2:	**Forest and Grasslands**	**Estimated Time: 10 days**

Brief Overview of Lesson: The focus of this lesson is on forests and grasslands, beginning with a woodland forest. It also highlights the park ranger STEM career. Students will make observations to learn about forests and grasslands, and investigate a pill bug's habitat. By the end of the lesson, students will use observations (first-hand or from media) to describe patterns in the natural world to answer scientific questions.

What students should know and be able to do to engage in this lesson:

- **Day 1:** Students will explore the phenomenon of a forest by formulating questions that will be investigated throughout the lesson.
- **Day 2:** Students will construct a small model forest habitat, observe what life is like in the habitat, and record their observations in a data table by following a step-by-step plan.
- **Day 3:** Students will watch the video *Types of Habitats* and explain their findings by using details from the video.
- **Day 4:** Students will read the *Living Things in Habitats* Science File and demonstrate their understanding by using key details in the text.
- **Day 5:** Students will plan an investigation to observe what happens when an earthworm is added to their pill bug habitat by carrying out an investigation.
- **Day 6:** Students will share their observations and data from their investigation with their classmates.
- **Day 7:** Students will read the *Forest Habitats* Science File and use the key details to demonstrate their understanding.

- **Day 8:** Students will research animals of grassland and forest habitats by writing a story using facts from their research.
- **Day 9:** Students will share their stories and compare and contrast them with their classmates.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
LS4.D: Biodiversity and Humans • There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1	PK: 5.3.3 Observe and describe how natural habitats provide for the basic needs of plants and animals with respect to shelter, food, water, air, and light (e.g., digging outside in the soil to investigate the kinds of animal life that live in and around the ground or replicating a natural habitat in a classroom terrarium).

Focus Question for this Lesson

What lives in forests and grasslands?

Learning Intention	**Success Criteria**
Day 1: • I am learning about the different animals that live in forests and grasslands. ***Day 2:*** • I am learning that different living things live in various habitats. • I am learning how animals are alike and different. ***Days 3-7:*** • I am learning that different living things live in various habitats. • I am learning that habitat can change. ***Day 8:*** • I am learning the differences between a woodland forest, and a rainforest. ***Days 9-10:*** • I am learning about grassland and forest habitat animals.	***Day 1:*** • I can discuss my ideas about the types of animals that live in forests and grasslands with my classmates. • I can ask questions and discuss the phenomenon of a forest with my group. • I can ask questions based on the essential question: What lives in forest and grasslands? ***Day 2:*** • I can make and discuss my predictions about what happens to a pill bug in its small habitat. • I can follow a step by step plan to construct a small model forest habitat. • I can write and draw my observations of the pill bug over a few days. • I can write and discuss how the pill bug gets what it needs to survive. ***Days 3-7:*** • I can draw and write about the following vocabulary words: forest and grasslands. • I can complete a table by listing the animals that live in each habitat.

	• I can plan and carry out an investigation to see what happens when you add an earthworm to your pill bug habitat. • I can make a prediction about how a bill bug and earthworm react in their forest habitat. • I can write the steps to complete my investigation. • I can draw and write observations of the earthworm and pill bug. • I can explain to my group why I think an earth worm would be an important animal in a forest. ***Day 8:*** • I can discuss one way a woodland forest is different from a rainforest to my group. • I can create a bar graph of the average rainfall in the Amazon Rainforest and White River National Forest. • I can compare and contrast the rainfall amounts between the two forests to my classmates. ***Days 9-10:*** • I can select an animal to research and identify what specifically I would like to learn about the animal. • I can write about what my animal needs to survive in its habitat? • I can discuss and share my claim with evidence based on the *EQ:*What lives in forests and grasslands? • I can demonstrate my learning by completing lesson two assessment.

Assessment(s)

Self-Assessment/Peer Assessment/Teacher Assessment

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

Students may think that all rain forests are found in warm, tropical regions. Temperate rain forests, however, are found in regions with mild temperatures such as the Pacific Northwest. Temperate rain forests lack the warm temperatures of the tropical rain forests, but still have high annual rainfall totals.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://wida.wisc.edu/teach/can-do/descriptors*

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level
- Encourage creativity and original thinking.
- Provide opportunities to make claims. **Claim Evidence Reasoning** **(Evidence Based Writing)**
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios
  - Student Driven Instruction

Lesson 3:	**Water Habitats**	**Estimated Time: 10 days**

Brief Overview of Lesson: This lesson focuses on water habitats, beginning with a coral reef, and highlights the park ranger STEM career. Students will make observations of the patterns in water habitats, and investigate brine shrimp and how fish float. By the end of the lesson, students will be able to use observations (first-hand or from media) to describe what habitats are, make a diorama to recreate a habitat, and be able to describe patterns in the natural world by making observations to answer scientific questions

What students should know and be able to do to engage in this lesson:

- **Day 1:** Students will explore the phenomenon of a water habitat by formulating questions to investigate throughout the lesson.
- **Day 2:** Students will show the differences between saltwater and freshwater by making a habitat for brine shrimp.
- **Day 3:** Students will explore saltwater and freshwater habitats in the brine shrimp investigation by watching the video *Oceans and Ponds*.
- **Day 4:** Students will learn about oceans and ponds by reading the *Living Things in Oceans and Ponds* Science File.
- **Day 5:** Students will explore that part of the fish's body that helps it survive in its water habitat by conducting an investigation.
- **Day 6:** Students will learn about different aspects of coral reefs, including where they are found and what lives there by completing the *Coral Reefs* Digital Interactive while
- **Day 7:** Students will learn about rivers and some of the plants and animals that live there by reading the *River Habitats* Science File.
- **Day 8:** Students will create a model of a water habitat by using the information found through research.
- **Day 9:** Students will share their habitat models with their classmates and compare and contrast theirs with their classmates.

LESSON FOUNDATION	
Assessed Standards for this lesson	**Important content not included in the standards**
LS4.D: Biodiversity and Humans • There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1	PK: 5.3.3 Observe and describe how natural habitats provide for the basic needs of plants and animals with respect to shelter, food, water, air, and light (e.g., digging outside in the soil to investigate the kinds of animal life that live in and around the ground or replicating a natural habitat in a classroom terrarium).
Focus Question for this Lesson	
What lives in water habitats?	
Learning Intention	**Success Criteria**
Day 1:	***Day 1:***

● I am learning that organisms that live in water need specific things to survive. ***Day 2:*** ● I am learning that there are two main types of water habitats: freshwater and saltwater. ***Days 3-7:*** ● I am learning that ponds and oceans are home to a large variety of organisms. ● I am learning that an ocean is a large body of saltwater ● I am learning that a pond is a small body of freshwater. ● I am learning that coral reefs are a kind of ocean habitat. ***Day 8:*** ● I am learning about rivers as freshwater habitats. ● I am learning about living things in rivers. ***Days 9-10:*** ● I am learning about water habitats.	● I can identify and explain what an organism needs to survive in water. ● I can discuss my ideas about the types of animals that live in a water habitat with my classmates. ● I can ask questions and discuss the phenomenon of a water habitat with my group. ● I can ask questions based on the essential question: What lives in a water habitat? ***Day 2:*** ● I can predict whether brine shrimp eggs will hatch in saltwater or freshwater. ● I can record my observation of when the brine shrimp eggs hatched. ● I can explain which water habitat the brine shrimp prefer with my classmates. ***Days 3-7:*** ● I can draw and write about the following vocabulary words: ocean and pond. ● I can explain to my classmates what kinds of animals live in a pond. ● I can compare and contrast the ocean and ponds. ● I can identify plants in an ocean habitat. ● I can describe how some plants are used in an ocean habitat. ● I can compare at least three different ocean animals ***Day 8:*** ● I can explain how rivers are different from lakes and ponds. ● I can discuss and explain what functions tree roots and branches that grow down into a river serve? ***Days 9-10:*** ● I can research a water habitat and create a specific question to guide my research. ● I can create a model of a water habitat. ● I can identify specific plants for my habitat. ● I can discuss and share my claim with evidence based on the *EQ:<u>What lives in water habitats?</u>* ● I can demonstrate my learning by completing lesson three assessment.
Assessment(s)	
Self-Assessment/Peer Assessment/Teacher Assessment.	

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

Some students may not understand the difference between land habitats and aquatic, or water, habitats. Remind them that some plants and animals can live only on land and that some can live only in water. Students may also think that aquatic plants and animals can live in both salt water and fresh water. Ask them if they understand the difference between the two types of water and why some plants and animals may be able to live in one type of water but not in the other.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA –* [*https://wida.wisc.edu/teach/can-do/descriptors*](https://wida.wisc.edu/teach/can-do/descriptors)

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level
- Encourage creativity and original thinking.
- Provide opportunities to make claims. **Claim Evidence Reasoning** **(Evidence Based Writing)**
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios
  - Student Driven Instruction

Lesson 4:	**Hot and Cold Deserts**	**Estimated Time: 10 days**

Brief Overview of Lesson: This lesson focuses on the hot and cold deserts, highlighting the park ranger STEM career. Students will observe and communicate information about the living things in hot and cold deserts, and investigate plant survival and animals that live in cold places. By the end of the lesson, students will use observations (first-hand or from media) to describe what lives in hot and cold deserts and describe patterns in the natural world by making observations and answering questions

What students should know and be able to do to engage in this lesson:

- **Day 1:** Students will explore the phenomenon of mountains and snow by formulating questions to investigate throughout the lesson.
- **Day 2:** Students will observe how various animals survive in hot and cold desert habitats by engaging in a simulation.
- **Day 3:** Students will begin to think about how an animal's body parts and food sources are related to the habitat where it lives by reading the Science Paired Read Aloud.
- **Day 4:** Students will define the vocabulary words by reading the Science Paired Read Aloud.
- **Day 5:** Students will find out about how plants survive in a desert habitat by planning and carrying out an investigation.
- **Day 6:** Students will compare and contrast hot and cold deserts by using a graphic organizer.
- **Day 7:** Students will investigate how animals stay warm in cold habitat by conducting an investigation.
- **Day 8:** Students will demonstrate what they learned about hot and cold deserts by completing a performance task.
- **Day 9:** Students will compare and contrast their habitat pictures and facts with their classmates.
- **Day 10:** Students will analyze the needs of a mystery animal to design a habitat for it.

LESSON FOUNDATION	
Assessed Standards for this lesson	**Important content not included in the standards**
LS4.D: Biodiversity and Humans	PK: 5.3.3

• There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1	Observe and describe how natural habitats provide for the basic needs of plants and animals with respect to shelter, food, water, air, and light (e.g., digging outside in the soil to investigate the kinds of animal life that live in and around the ground or replicating a natural habitat in a classroom terrarium).

Focus Question for this Lesson

What lives in hot and cold deserts?

Learning Intention	**Success Criteria**
Day 1: ● I am learning about hot and cold deserts ***Day 2:*** ● I am learning about animals that live in both cold and hot desert habitats. ***Days 3-7:*** ● I am learning that plants and animals are able to live in extreme habitats. ***Day 8:*** ● I am learning that animals have features that help them survive when it is very cold. ***Days 9-10:*** ● I am learning that there are many different kinds of living things in different habitats.	***Day 1:*** ● I can discuss my ideas about the hot and cold deserts with my classmates. ● I can ask questions and discuss the phenomenon of mountains with snow with my group. ● I can ask questions based on the essential question: What lives in hot and cold deserts ***Day 2:*** ● I can make a prediction about how I think animals are able to live in cold deserts. ● I can record my observations of animals in a hot desert during the day and night. ● I can record my observation of animals in a cold desert during the summer and winter. ● I can discuss and explain what most animals do in a hot desert during the middle of the day with my classmates. ● I can read a story and answer questions about how animal's body parts and the source of food is related to their habitat. ***Days 3-7:*** ● I can create a sentence and illustrate a picture of the vocabulary words: desert and Arctic. ● I can explain how Arctic animals stay warm to my classmates. ● I can plan and carry out an investigation about plants in a desert habitat. ● I can draw and write about what I observed during the investigation. ● I can discuss and explain to my classmates how a cactus is able to survive without water? ● I can compare and contrast hot and cold desert with my classmates.

	Day 8: ● I can predict whether hot water will stay warm in a foam cup or a regular cup. ● I can measure the temperature in each cup using a thermometer. ● I can record the temperature of each cup at 5 minute intervals. ● I can explain to my classmates how and why which container kept the water warm longer. ● I can discuss with my classmates how and why Arctic animals stay warm in their cold habitat. ● I can design a habitat for mystery animals. ***Days 9-10:*** ● I am learning that there are many different kinds of living things in different habitats.

Assessment(s)

Self-Assessment/Peer Assessment/Teacher Assessment

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STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

Students may think that deserts are only hot. But deserts can also be quite chilly during the nighttime hours, with temperatures dropping close to freezing. "Cold deserts" are hot in summer and cold in winter or cold and barren the entire year. Cold deserts include the Great Basin in the western United States and the Gobi Desert in eastern Asia. Let students know that the Arctic region above the Arctic Circle contains an area classified as a cold desert. Although frigid, these dry areas are similar to a hot desert like the Sahara because they receive very little precipitation.

Integrated Accommodations & Modifications

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  - Student Driven Instruction

Module: Earth's Surface Changes

Stage 1 – Desired Results

ASSESSED FOCUS STANDARDS:

ESS1.C: The History of Planet Earth

- Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1)

ESS2.A: Earth Materials and Systems

- Wind and water can change the shape of the land.

ETS1.C: Optimizing the Design Solution

- Because there is always more than one possible solution to a problem, it is useful to compare and test designs. *(secondary)*

Primary NJSLS ELA/Literacy Connections:

RI.2.1 Ask and answer such questions as *who, what, where, when, why,* and *how* to demonstrate understanding of key details in a text.

W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.

W.2.7 Participate in shared research and writing projects (e.g., explore a number of books by a

Unit Description

Anchoring Phenomenon

Statement: Earth's surface is constantly changing.
Observation/Demonstration/Experience: Photo of a flooded area.
Driving Question: How does Earth's surface change quickly?

Meaning

ENDURING UNDERSTANDINGS

- Weather plays a major role in the changes of Earth's surface.
- Weathering is a natural process on Earth in which rock and other materials are broken down.
- Mechanical weathering occurs when water, wind, and other physical forces wear away rock.
- Chemical weathering occurs when chemicals, such as acid rain, transform rock into new compounds.
- Mechanical weathering accelerates chemical weathering because it increases the surface area of exposed rock.

ESSENTIAL QUESTIONS

- How do wind and water change Earth's surface?
- How does Earth's surface change quickly?
- How do people cause and prevent changes to Earth's surface?

favorite author and express opinions about them). SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. **Primary NJSLS Mathematics Connections:** MP.2 Reason abstractly and quantitatively. MP.5 Use appropriate tools strategically.	• Erosion is the movement of weathered material—sediments—from one place to another. • Agents of erosion include gravity, moving water, waves, wind, glacier movement. • Where sediments are ultimately laid down, deposition occurs. Deposition builds up and changes the surface of the land. • The processes of weathering, erosion, and deposition are continually shaping Earth's surface.	
	What students will know and be able to do	
	KNOWLEDGE **Lesson 1:** I can plan a model to show how wind and water changes Earth's surface. **Lesson 2:** I can construct an explanation to show how the earth's surface can change quickly. **Lesson 3:** I can compare solutions of how people prevent changes to Earth's surface.	**SKILLS** **2-ESS1-1:Use information from several sources to provide evidence that Earth events can occur quickly or slowly.** **[Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.]** **Constructing Explanations and Designing Solutions;Stability and Change** **2-ESS2-1:Compare multiple solutions designed to slow or prevent wind from changing the shape of the land.** **[Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back**

		wind and water, and different designs for using shrubs, grass, and trees to hold back the land.] **Constructing Explanations and Designing Solutions;Stability and Change**

Stage 2 – Evidence

SUMMATIVE ASSESSMENT(S)

Performance Task:

Lesson 1:

- Earth's Slow Changes Performance Task
  - Earth's Slow Changes Rubric

Lesson 2:

- Make a Model of a Quick Change Performance Task
  - Make a Model of a Quick Change Rubric

Lesson 3:

- Reducing Flood Damage Performance Project
  - Reducing Flood Damage Rubric

Performance Projects:

- **Reducing Flood Damage**

STEM Gauge K-2

Claim Evidence Reasoning (Evidence Based Writing)

PRE-ASSESSMENT

Page Keeley Science Probe:

- **Lesson 1**: Shapes of Landforms
- **Lesson 2:** Quick Changes
- **Lesson 3:** How Do People Change Earth's Surface?

Integration of 21st Century Skills	Integration of Technology	Career Education
9.4.2.CI.1: Demonstrate openness to new ideas and perspectives. **9.4.2.CI.2:** Demonstrate originality and inventiveness in work. **9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem. **9.4.2.CT.2:** Identify possible approaches and resources to execute a plan. **9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).	McGraw Hill Digital Resources via CLEVER Earth's Surface Changes Lesson 1: Vocabulary Looking carefully at Land-forms Lesson 2: Vocabulary The Parts of a Volcano Landslides Lesson 3: Vocabulary Wind Erosion Discovery Education Weathering and Erosion: Making Models Weathering and Erosion: Paul and his Science Pals	**Geologist** Introduce Career Kid Maya, who wants to be a geologist when she grows up. A geologist is a scientist who studies how Earth was shaped and how it continues to change. Wind and water can change the surface of Earth slowly while earthquakes and floods can change it quickly. **Meteorologist**

	Music Video:Weathering and Erosion Landslide Science Kids: All about Volcanoes Mystery Science If you floated down a river, where would you end up? Why is there sand at the beach? What's strong enough to make a canyon? How can you stop a landslide?	Introduce Career Kid Hugo, who wants to be a meteorologist when he grows up. A meteorologist is a person who studies weather. Weather can affect the rocks and soil that make up Earth's surface.

Stage 3 – Learning Plan

UNIT VOCABULARY

erosion rock soil flood	landslide earthquake volcano erupt weathering	coast windbreaks natural resource lava sand

SUMMARY OF KEY LEARNING

Lesson 1: Weathering and Erosion

Lesson 1: Day 1 - Module Opener, Vocabulary, STEM career connection, Page Keeley Probe

- **Learning Intention:**
  - I am learning that flooding can happen when it rains heavily in a short period of time or when a mass of ice melts.
  - I am learning the shapes of landforms.
- **Success Criteria:**
  - I can ask questions about what happens when an area is flooded.
  - I can explain what happens when an area is flooded.
  - I can make a selection based on the probe and explain my choice.
- **Brief Overview of Lesson:**
  Students are engaged with the phenomenon of a photo of a flooded area. Students will be introduced to the module's vocabulary words. The STEM career of a geologist is introduced. Prompt students to ask questions about the career. This probe is intended to uncover students' basic ideas about weathering agents and erosion. Use this probe to assess prior knowledge and uncover misconceptions that will drive lesson instruction.

Lesson 1: Days 2& 3 - Phenomenon, Essential Question and Inquiry Activity: How can you change rocks?

- **Learning Intention:**
  - I am learning that wind and water change Earth's surface.
- **Success Criteria:**
  - I can explain why I think the large rock is in the water.
  - I can ask questions about the phenomenon of a large sea arch.
  - I can make a prediction about what will happen to pieces of chalk when shaken in a jar with pebbles.

- I can make different models of a jar at different time intervals.
- I can explain why the chalk changed more after being shaken in water.
- I can explain how the Sphinx was made and what caused some of its features to change overtime.

- **Brief Overview of Lesson:**
  - Students are engaged with the phenomenon of a large rock in the water. Students will turn their observations into questions about the phenomenon. The STEM career of a meteorologist is introduced. Prompt students to ask questions about their career. Have students read the essential and record their thoughts and questions about the essential question using chart paper so they can reference them throughout the lesson. Students will also observe how pebbles and water can weather pieces of chalk.

Lesson 1: Days 4-6 -Obtain and Communicate Information: *Inquiry Activity- Erosion*
Reflect and Refine, Science and Engineering Practices

- **Learning Intention:**
  - I am learning that weather and erosion can change the surface of earth.
  - I am learning that wind can erode land.
- **Success Criteria:**
  - I can use the following vocabulary words (erosion, flood, rock, weathering, soil and sand) when explaining weathering and erosion.
  - I can explain to my classmates how floods erode the land.
  - I can draw and explain an example of erosion.
  - I can make a prediction in my notebook of what will happen to a sand mountain when you slowly blow on it?
  - I can draw and label three models of a sand mountain after blowing on it with different forces.
- **Brief Overview of Lesson:**
  Using the teacher presentation slide, display the words and their definitions. Have students add the words to a word wall so they can reference them as they move through the lesson. Students will learn how water and wind can change the surface of Earth. While reading, students will encounter the vocabulary words: erosion, rock, soil, flood, weathering, and sand. Have students cut out and fill in the Dinah Zike Visual Kinesthetic Vocabulary. In the Inquiry activity students will build a mountain of sand and blow on it, simulating wind.

Lesson 1: Days 7 & 8 - How landforms are made, quick check, reflect and refine and research, investigate and communicate: Inquiry Activity: Model Weathering

- **Learning Intention:**
  - I am learning that different landforms are formed by weathering and erosion.
  - I am learning that water can slowly break down an object.
- **Success Criteria:**
  - I can explain how dunes, sea arches and rock pedestals are formed.
  - I can match landforms to the type of erosion that helped form it.
  - I can complete a main idea graphic organizer to describe how erosion changes Earth's slowly in many years.
  - I can revisit the Page Keeley Science Probe to decide whether I need to change or justify my response.
  - I can make a prediction about how many drops of water it will take to change the shape of a sugar cube.
- **Brief Overview of Lesson:**

Students will learn about different landforms and how they were formed by weathering and erosion Complete the main idea graphic organizer as a class. Students will model the process of weathering by water.

Lesson 1: Days 9 &10-Performance Task: *Earth's Slow Changes* and eAssessment.

- **Learning Intention:**
  - I am learning that earth's landforms are slowly changing.
- **Success Criteria:**
  - I can discuss how to draw a model of a slow landform change.
  - I can draw a model of a landform and label the parts of the landform where weathering or erosion have happened.
  - I can discuss and share my claim with evidence based on the *EQ:How can wind and water change Earth's surface?*
  - I can demonstrate my learning by completing lesson one assessment.
- **Brief Overview of Lesson:** Students will choose a landform and a type of slow change, such as erosion by wind or weathering by water, that it could undergo. Then they will draw the slow change. Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: How can wind and water change Earth's surface? Students will see whether and how their thinking has changed. Students will complete lesson one assessment.

Using the Leveled Readers
Bryce Canyon

. Have students identify the sources of the weathering that have occurred in Bryce Canyon

Lesson 2: Quick Changes to Earth's Surface

Lesson 2: Days 1 & 2 - Page Keeley Probe, Science in my world, STEM career connection, Inquiry Activity: Model quick changes to Earth.

- **Learning Intention:**
  - I am learning that certain events can cause rapid changes to Earth's surface.
- **Success Criteria:**
  - I can select and explain why certain things can cause quick changes to Earth's surface?
  - I can create a list of questions about the phenomenon of the damaged road.
  - I can ask questions based on the essential question: How can Earth's surface change quickly?
  - I can create a model of Earth's surface using sand, blocks and twigs.
  - I can draw and label models of Earth's surface before and after a gentle and hard twist.
  - I can describe the changes to my classmates.
- **Brief Overview of Lesson:**
  This probe is intended to uncover students' basic ideas about events that cause rapid changes to Earth's surface. Use this probe to assess prior knowledge and uncover misconceptions that will drive lesson instruction. Spark your students' curiosity about the world by introducing the lesson phenomenon of the damaged road. Students will also model a quick change to Earth's surface.

Lesson 2: Days 3-7 - Visiting a volcano, Obtain and communicate information, *Events that changes earth's surface, Parts of a volcano, Earthquakes*
Reflect and Refine, Science and Engineering Practices

- **Learning Intention:**
  - I am learning that land changes after a volcano eruption.

- I am learning that landslides, earthquakes, and volcanic eruptions cause rapid changes to Earth's surface.
- I am learning the parts of a volcano.

- **Success Criteria:**
  - I can discuss with my classmate why the trail where the volcano erupted is mostly brown.
  - I can use the lesson vocabulary (landslide, earthquakes, volcano, erupt & lava) when explaining quick changes to Earth's surface.
  - I can explain how weathering is similar to and different from landslides, earthquakes, and volcanic eruptions.
  - I can explain the difference between magma and lava.
  - I can make predictions about what will happen to the sides and surrounding surface of a volcano when it erupts.
  - I can explain to my classmates where many earthquakes occur.
- **Brief Overview of Lesson:**
  Students will use the lesson vocabulary (landslide, earthquakes, volcano, erupt & lava) when explaining quick changes to Earth's surface. Students will learn about rapid changes to Earth's surface, such as landslides, earthquakes, and volcanic eruptions. Students will make a model of a volcanic eruption.

Lesson 2: Day 8 - Research, Investigate and Communicate, Landslides Digital Interactive, Flooding Research

- **Learning Intention:**
  - I am learning that landslides are the sudden movement of soil from higher to lower ground.
  - I am learning that a flood is caused by heavy rainfall, tsunami, or melting snow.
- **Success Criteria:**
  - I can explain what role gravity plays in landslides.
  - I can conduct research on floods.
  - I can analyze the steps involved when a flood occurs and fill out a graphic organizer in sequence.
- **Brief Overview of Lesson:**
  Students will explore different examples of landslides that occur in different places. While reading, students will encounter the vocabulary word: landslide. If necessary, explain to students that gravity is a force that pulls objects toward Earth. Students will use the provided resources to find information about floods

Lesson 2: Days 9 & 10-Performance Task: *Make a Model of a Quick Change* and eAssessment.

- **Learning Intention:**
  - I am learning that quick changes such as earthquakes, floods, landslides or tsunamis can change Earth's surface.
- **Success Criteria:**
  - I can draw and label a model of before and after quick changes on Earth's Surface.
  - I can discuss and share my claim with evidence based on the *EQ:How can Earth's surface change quickly?*
  - I can demonstrate my learning by completing lesson one assessment.
- **Brief Overview of Lesson:** Students will choose one of the quick changes they've learned about. They will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential

question: How can Earth's surface change quickly? Students will see whether and how their thinking has changed. Students will complete lesson two assessment.

Using the Leveled Readers

Fast Changes on Earth

Have students identify types of changes that occur on Earth during these types of natural events.

Lesson 3: Slowing Earth's Changes

Lesson 3: Day 1- Page Keeley Probe, Phenomenon, STEM career connection

- **Learning Intention:**
  - I am learning that people can change Earth's surface.
- **Success Criteria:**
  - I can discuss and explain how people change Earth's Surface,
  - I can ask questions about the phenomenon of the sand dunes with plants.
  - I can ask questions about the essential question: How can people slow the changes to Earth's surface?
- **Brief Overview of Lesson:**

  This probe is intended to uncover students' basic ideas about human impact on landforms. Use this probe to assess prior knowledge and uncover misconceptions that will drive lesson instruction. Spark your students' curiosity about the world by introducing the lesson phenomenon of the sandy beach. Reintroduce Career Kid Hugo the meteorologist.

Lesson 3: Day 2 - Inquiry Activity: Beach Erosion

- **Learning Intention:**
  - I am learning that waves can erode the sand on the beaches.
- **Success Criteria:**
  - I can make a prediction about what happens to a beach when water and waves touch the sand.
  - I can create and label a model of a beach that is eroded by water.
  - I can design a solution to keep sand from washing away from the beach.
- **Brief Overview of Lesson:**

  Students will investigate how waves affect a beach. Point out that students just saw a photo of a sandy beach. Now they will make a model showing erosion of a beach. Help students make a prediction. Remind them that a prediction is a statement of what they expect to observe in the future.

Lesson 3: Days 3-7 - Obtain and Communicate Information, Coastal Erosion video,Wind Erosion Simulation, Ways to prevent land erosion digital interactive, Quick Check, Reflect and Refine.

- **Learning Intention:**
  - I am learning that people can help slow the changes to Earth's surface.
  - I am learning that there are different structures used to prevent wind and water erosion.
  - I am learning that wind can affect the soil where farmers grow crops.
  - I am learning that people can build and plant to prevent land erosion.
- **Success Criteria:**
  - I can use the following vocabulary words to explain how people can help slow the changes to Earth's surface. (coast, windbreak & natural resources)
  - I can explain why different windbreaks protect soil better than others.
  - I can explain how planting fields in curved rows slow soil erosion.
  - I can complete the graphic organizer to identify some ways that wind and water shape the land.
  - I can revisit Page Keeley to decide whether I want to change or justify my response.
- **Brief Overview of Lesson:**

Using the teacher presentation slide, display the lesson vocabulary and their definitions. You might want to have students add the words to a word wall so they can reference them as they move through the lesson. Have students watch the video *Coastal Erosion*. Students will model coastal erosion in the Explore activity. Students will explore how wind and windbreaks can affect a farmer's soil and, therefore, production of crops.

Lesson 3: Day 8 - Research, Investigate and Communicate: Inquiry Activity; Create a model of a map.

- **Learning Intention:**
  - I am learning that you can reduce wind erosion by using windbreaks.
- **Success Criteria:**
  - I can create a solution to reduce wind erosion at the beach.
  - I can draw and label my wind erosion solution.
  - I can describe how to make improvements to my solution.
- **Brief Overview of Lesson:**
  Students will make a model of a beach and use classroom materials to design a windbreak to reduce wind erosion for the beach. Students' windbreak designs will vary, but students should find that any windbreak that is positioned in the direction perpendicular to the wind direction will reduce erosion.

Lesson 3: Days 9 & 10-Performance Task: *Make a Model of a Landform* and eAssessment.

- **Learning Intention:**
  - I am learning that you can reduce wind erosion by using windbreaks.
- **Success Criteria:**
  - I can compare my solution with my classmates to see who has created the better solution.
  - I can draw and write about the erosion that happened to my beach model.
  - I can draw and write about the erosion that happened to my classmate's beach model.
  - I can identify and explain who had the best windbreak solution to slow or stop wind erosion?
  - I can discuss and share my claim with evidence based on the *EQ:How can people slow the changes to Earth's surface?*
  - I can demonstrate my learning by completing lesson one assessment.
- **Brief Overview of Lesson:**
  Students will test the model windbreak that we created in the Elaborate activity and compare their models to other groups' models. They will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: How can people slow the changes to Earth's surface? Students will see whether and how their thinking has changed. Students will complete lesson three assessment.

CULTURALLY RESPONSIVE TEACHING in PRACTICE	**SOCIAL EMOTIONAL LEARNING in PRACTICE**
• Diversity in STEM: Nova: Secret Life of Scientist and Engineers) • Impact News Here you will find the latest topical and news stories in the world of science. • Helping Communities! • Science News & Science News for students • -warmest year	**Awareness of Self & Others: My Creative Strengths** Self-knowledge is the ability to understand one's own interests, feelings, weaknesses, and strengths, as well as learning and relating styles. Self-knowledge is the starting point for all social and emotional learning. In fact, self-knowledge influences all areas of SEL

• 8 projects bringing safe, sustainable water sources to communities around the world • The Island Name after a satellite. • Our island, our paradise • Girls in STEM	including self-management, social awareness, relationship skills, and responsible decision-making. **Self-knowledge** helps students to know when they are on the right path and are making decisions that are aligned with who they are. It also can serve as a guide when students are going against their own strengths, styles, personalities, and purpose and help students re-align with who they are. The more a student understands him or herself, the better he or she will grow and adapt in all areas of life. **Self-Management:**Focus First! -Students will identify distractions and advocate for themselves in order to focus better in class. **Self-Management:**If at First You Don't Succeed... Students will practice strategies for persistence. **Self-Management:** Reach Your Goal-Students will identify a personal goal and the steps to achieve it. **Self-Management:** You Can Change It! Students will learn strategies for changing feelings, thoughts, and behaviors in stressful situations. **Self-Care:** I Believe in Me! Students will develop strategies for building belief to reach a goal**.** Self-efficacy is the belief in oneself. A student's self-efficacy greatly influences his or her academic motivation, learning, and achievement. Therefore, it is imperative that teachers address students' self-efficacy. Going-beyond-how-are-you-feeling This article focuses on:When students have the language to

	describe their feelings and needs, they are better equipped to help themselves and each other. Edutopia.org-Article/helping-students-process-their-feelings-during-remote-learning Why is it Important to Accept Others?

Lesson 1:	**Weathering and Erosion**	**Estimated Time: 10 days**

Brief Overview of Lesson:
This lesson focuses on the slow processes that change Earth's surface, highlighting the meteorologist STEM career. Students will construct explanations of how weathering and erosion change the surface of Earth over a period of time. By the end of this lesson, students will make observations to construct an evidence-based account of how wind and water change Earth's surface.

What students should know and be able to do to engage in this lesson:

- Students will explore the phenomenon of a flooded area by formulating questions that will be investigated throughout the lesson.
- Students will uncover basic ideas about weathering agents and erosion by completing the Page Keeley Science Probe.
- Students will observe how pebbles and water can weather pieces of chalk by carrying out an investigation and recording data.
- Students will learn about a real-world example of weathering by answering questions using key details from the text.
- Students will learn how water and wind can change the surface of Earth by reading the text in the Science Paired Read Aloud.
- Students will model what happens when wind erodes by carrying out an investigation and recording their findings.
- Students will complete the *How Landforms are Made* Digital Interactive about different landforms by explaining how they were formed by weathering and erosion.
- Students will model the process of weathering by water by carrying out an investigation and recording data.
- Students will use what they have learned by drawing landforms that undergo weathering or erosion.
- Students will compare and contrast their models to other students' models by sharing their observations from the activity, *Earth's Slow Changes*.

LESSON FOUNDATION	
Assessed Standards for this lesson	**Important content not included in the standards**
ESS1.C: The History of Planet Earth • Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1)	PK **5.4.1** Explore and describe characteristics of soil, rocks, water, and air (e.g., sorting rocks by shape and/or

<table>
<tr><td><u>ESS2.A: Earth Materials and Systems</u>
• Wind and water can change the shape of the land.
ETS1.C: Optimizing the Design Solution
• Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (secondary)</td><td>color, observing water as a solid and a liquid, noticing the wind’s effect on playground objects).
<u>5.3.1</u>
Observe and record weather (e.g., chart temperatures throughout the seasons or represent levels of wind by waving scarves outdoors).</td></tr>
<tr><td colspan="2">Focus Question for this Lesson</td></tr>
<tr><td colspan="2">How do wind and water change Earth’s surface?</td></tr>
<tr><td>Learning Intention</td><td>Success Criteria</td></tr>
<tr><td>Day 1:
● I am learning that flooding can happen when it rains a lot in a short period of time or when a mass of ice melts.
● I am learning about the shapes of landforms.
Days 2 and 3:
● I am learning that wind and water change Earth’s surface.
Days 4-6:
● I am learning that weather and erosion can change the surface of earth.
● I am learning that wind can erode land.
Days 7 and 8:
● I am learning that different landforms are formed by weathering and erosion.
● I am learning that water can slowly break down an object.
Days 9 and 10:
● I am learning that earth’s landforms are slowly changing.</td><td>Day 1:
● I can ask questions about what happens when an area is flooded.
● I can explain what happens when an area is flooded.
● I can make a selection based on the probe and explain my choice.
Days 2 and 3:
● I can explain why I think the large rock is in the water.
● I can ask questions about the phenomenon of a large sea arch.
● I can make a prediction about what will happen to pieces of chalk when shaken in a jar with pebbles.
● I can make different models of a jar at different time intervals.
● I can explain why the chalk changed more after being shaken in water.
● I can explain how the Sphinx was made and what caused some of its features to change overtime.
Day 4-6:
● I can use the following vocabulary words (erosion, flood, rock, weathering, soil and sand) when explaining weathering and erosion.
● I can explain to my classmates how floods erode the land.
● I can draw and explain an example of erosion.
● I can make a prediction in my notebook of what will happen to a sand mountain when you slowly blow on it?</td></tr>
</table>

	● I can draw and label three models of a sand mountain after blowing on it with different forces **Days 7 and 8:** ● I can explain how dunes, sea arches and rock pedestals are formed. ● I can match landforms to the type of erosion that helped form it. ● I can complete a main idea graphic organizer to describe how erosion changes Earth's slowly in many years. ● I can revisit the Page Keeley Science Probe to decide whether I need to change or justify my response. ● I can make a prediction about how many drops of water it will take to change the shape of a sugar cube. **Days 9 and 10:** ● I can discuss how to draw a model of a slow landform change. ● I can draw a model of a landform and label the parts of the landform where weathering or erosion have happened. ● I can discuss and share my claim with evidence based on the *EQ:How can wind and water change Earth's surface?* ● I can demonstrate my learning by completing lesson one assessment.

Assessment(s)

Self-Assessment/Peer Assessment/Teacher Assessment

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Students may think that Earth was always the way it is now or that any changes on Earth's surface must have occurred suddenly,
  such as through earthquakes. Explain to students that although they may not be able to see it, the Earth's surface is always changing.

- Tell students that the mountains, beaches, and rivers they may be familiar with were very different hundreds, thousands, and millions of years ago. Encourage students to think of tangible examples to help undo the misconception. For example, help them realize that water is a powerful force in shaping Earth's surface. Ask students if they have seen powerful waves crash on the beach or whether they have observed changes caused by a storm to soil on the ground.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://wida.wisc.edu/teach/can-do/descriptors*

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level.
- Encourage creativity and original thinking.
- Provide opportunities to make claims. **Claim Evidence Reasoning** **(Evidence Based Writing)**
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills

- Adjusting the pace of lessons
- Interest based content
- Real world scenarios
- Student Driven Instruction

Lesson 2:	Quick Changes to Earth's Surface	Estimated Time: 10 days

Brief Overview of Lesson: This lesson focuses on the quicker changes to Earth's surface such as earthquakes and landslides, highlighting the phenomenon of a road that has crumbled due to an earthquake. By the end of the lesson, students will construct an explanation based on evidence about events that change Earth's surface quickly.

What students should know and be able to do to engage in this lesson:

- **Day 1:** Students will explore the phenomenon of a damaged road by formulating questions that will be investigated throughout the lesson.
- **Day 2:** Students will model a quick change to Earth's surface by explaining the phenomenon that is identified in an image.
- **Day 3:** Students will define vocabulary words and learn about rapid changes to Earth's surface, such as landslides, earthquakes, and volcanic eruptions by using key details in the text.
- **Day 4:** Students will read about several different parts of a volcano, both above and below Earth's surface by exploring the *Parts of a Volcano* Digital Interactive.
- **Day 5:** Students will make a model of a volcanic eruption by conducting an investigation and recording their process and observations.
- **Day 6:** Students will learn more about the historic 1906 earthquake that happened in San Francisco, California by reading the *Earthquakes* Science File.
- **Day 7:** Students will explore different examples of landslides that occur in different places by carrying out an investigation and recording data.
- **Day 8:** Students will draw a model of a quick change by demonstrating how a phenomenon occurs.
- **Day 9:** Students will compare and contrast their models of a quick change by sharing their observations with classmates.

LESSON FOUNDATION

Assessed Standards for this lesson	Important content not included in the standards
ESS1.C: The History of Planet Earth • Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1) **ESS2.A: Earth Materials and Systems** • Wind and water can change the shape of the land. **ETS1.C: Optimizing the Design Solution** • Because there is always more than one possible solution to a problem, it is useful to compare and test designs. *(secondary)*	PK **5.4.1** Explore and describe characteristics of soil, rocks, water, and air (e.g., sorting rocks by shape and/or color, observing water as a solid and a liquid, noticing the wind's effect on playground objects). **5.3.1** Observe and record weather (e.g., chart temperatures throughout the seasons or represent levels of wind by waving scarves outdoors).

Focus Question for this Lesson	
How does Earth's surface change quickly?	
Learning Intention	**Success Criteria**
Days 1 & 2: ● I am learning that certain events can cause rapid changes to Earth's surface. ***Days 3-7:*** ● I am learning how land changes after a volcano eruption. ● I am learning that landslides, earthquakes, and volcanic eruptions cause rapid changes to Earth's surface. ● I am learning the parts of a volcano. ***Day 8:*** ● I am learning that landslides are the sudden movement of soil from higher to lower ground. ● I am learning that a flood is caused by heavy rainfall, tsunami, or melting snow. ***Days 9-10:*** ● I am learning that quick changes such as earthquakes, floods, landslides or tsunamis can change Earth's surface.	***Days 1 & 2:*** ● I can select and explain why certain things can cause quick changes to Earth's surface? ● I can create a list of questions about the phenomenon of the damaged road. ● I can ask questions based on the essential question: How can Earth's surface change quickly? ● I can create a model of Earth's surface using sand, blocks and twigs. ● I can draw and label models of Earth's surface before and after a gentle and hard twist. ● I can describe the changes to my classmates. ***Days 3-7:*** ● I can discuss with my classmate why the trail where the volcano erupted is mostly brown. ● I can use the lesson vocabulary (landslide, earthquakes, volcano, erupt & lava) when explaining quick changes to Earth's surface. ● I can explain how weathering is similar to and different from landslides, earthquakes, and volcanic eruptions. ● I can explain the difference between magma and lava. ● I can make predictions about what will happen to the sides and surrounding surface of a volcano when it erupts. ● I can explain to my classmates where many earthquakes occur. ***Day 8:*** ● I can explain what role gravity plays in landslides. ● I can conduct research on floods. ● I can analyze the steps involved when a flood occurs and fill out a graphic organizer in sequence. ***Days 9-10:*** ● I can draw and label a model of before and after quick changes on Earth's Surface.

	• I can discuss and share my claim with evidence based on the *EQ:How can Earth's surface change quickly?* • I can demonstrate my learning by completing lesson one assessment.

Assessment(s)

Self-Assessment/Peer Assessment/Teacher Assessment

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Students may think that all earthquakes cause damage. Earthquakes happen every day on Earth, and most are not destructive or even felt. For example, according to the U.S. Geological Survey, Southern California experiences about 10,000 earthquakes each year. Most of these have a magnitude so small that they aren't even noticeable.
- Students often confuse magma and lava and may use the terms interchangeably. Point out that both terms refer to the same thick, "goopy" material: molten rock! However, magma refers to the molten material while it is still underground. Lava, on the other hand, refers to the molten material once it has erupted, and is thus above ground, an image with which students are likely to be familiar.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA –* [*https://wida.wisc.edu/teach/can-do/descriptors*](https://wida.wisc.edu/teach/can-do/descriptors)

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions

- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level
- Encourage creativity and original thinking.
- Provide opportunities to make claims. **Claim Evidence Reasoning** **(Evidence Based Writing)**
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios
  - Student Driven Instruction

Lesson 3:	**Slowing Earth's Changes**	**Estimated Time: 10 days**

Brief Overview of Lesson: This lesson focuses on the changes that Earth's surface goes through as well as how people can help to slow those changes using natural resources. By the end of the lesson, students will construct an evidence-based account of how people can help slow the changes to Earth's surface. They will compare multiple solutions designed to slow or prevent wind from changing the shape of land.

What students should know and be able to do to engage in this lesson:

- **Day 1:** Students will explore the phenomenon of a sandy beach by formulating questions that will be investigated throughout the lesson.
- **Day 2:** Students will investigate how waves affect a beach by making a model of a beach in the Inquiry Activity, *Beach Erosion*.
- **Day 3:** Students will make connections for coastal erosion to beach erosion by watching the video *Coastal Erosion*.
- **Day 4:** Students will explore how wind and windbreaks can affect a farmer's soil and, therefore, production of crops by conducting an investigation.
- **Day 5:** Students will complete the *Ways to Prevent Land Erosion* Digital Interactive by learning about different methods that are used to stop erosion from beaches and farm fields.
- **Day 6:** Students will demonstrate how beach erosion occurs by designing their own solution to minimize beach erosion.

- **Day 7:** Students will compare their solutions to reduce wind erosion by testing their models.
- **Day 8:** Students will discuss the results of the tests on the different models by sharing their findings from the Inquiry Activity, *Compare Solutions*.
- **Day 9:** Students will design a solution to the problem of how to stop an area from flooding by completing that Performance Project, *Reducing Flood Damage.*

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
ESS1.C: The History of Planet Earth • Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1) **ESS2.A: Earth Materials and Systems** • Wind and water can change the shape of the land. **ETS1.C: Optimizing the Design Solution** • Because there is always more than one possible solution to a problem, it is useful to compare and test designs. *(secondary)*	PK **5.4.1** Explore and describe characteristics of soil, rocks, water, and air (e.g., sorting rocks by shape and/or color, observing water as a solid and a liquid, noticing the wind's effect on playground objects). **5.3.1** Observe and record weather (e.g., chart temperatures throughout the seasons or represent levels of wind by waving scarves outdoors).

Focus Question for this Lesson

How do people cause and prevent changes to Earth's surface?

Learning Intention	**Success Criteria**
Day 1: • I am learning that people can change Earth's surface. ***Day 2:*** • I am learning that waves can erode the sand on the beaches. ***Days 3-7:*** • I am learning that people can help slow the changes to Earth's surface. • I am learning that there are different structures used to prevent wind and water erosion. • I am learning that wind can affect the soil where farmers grow. • I am learning that people can build and plant to prevent land erosion. ***Day 8:*** • I am learning that you can reduce wind erosion by using windbreaks. ***Days 9-10:*** • I am learning that you can reduce wind erosion by using windbreaks.	***Day 1:*** • I can discuss and explain how people change Earth's Surface, • I can ask questions about the phenomenon of the sand dunes with plants. • I can ask questions about the essential question: How can people slow the changes to Earth's surface? ***Day 2:*** • I can make a prediction about what happens to a beach when water and waves touch the sand. • I can create and label a model of a beach that is eroded by water. • I can design a solution to keep sand from washing away from the beach. ***Days 3-7:*** • I can use the following vocabulary words to explain how people can help slow the changes to Earth's surface. (coast, windbreak & natural resources) • I can explain why different windbreaks protect soil better than others.

	● I can explain how planting fields in curved rows slow soil erosion. ● I can complete the graphic organizer to identify some ways that wind and water shape the land. ● I can revisit Page Keeley to decide whether I want to change or justify my response. ***Day 8:*** ● I can create a solution to reduce wind erosion at the beach. ● I can draw and label my wind erosion solution. ● I can describe how to make improvements to my solution. ***Days 9-10:*** ● I can compare my solution with my classmates to see who has created the better solution. ● I can draw and write about the erosion that happened to my beach model. ● I can draw and write about the erosion that happened to my classmate's beach model. ● I can identify and explain who had the best windbreak solution to slow or stop wind erosion? ● I can discuss and share my claim with evidence based on the *EQ:<u>How can people slow the changes to Earth's surface?</u>* ● I can demonstrate my learning by completing lesson one assessment.

Assessment(s)

Self-Assessment/Peer Assessment/Teacher Assessment

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

Students may think that all pollution is caused by human activities. Although human factors, such as industrialization and motor vehicle emissions, contribute an overwhelmingly significant amount of pollution, many natural processes on Earth can also be a source of pollution. For example, volcanic eruptions produce ash, smoke, carbon dioxide, and other air pollutants; while forest fires, caused by lightning and other natural

causes, release a similar set of pollutants. Dust blown by wind from areas of little vegetation contributes to air pollution. Rotting vegetation and microbial activity in wetlands give off methane gas.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA –* [*https://wida.wisc.edu/teach/can-do/descriptors*](https://wida.wisc.edu/teach/can-do/descriptors)

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level
- Encourage creativity and original thinking.
- Provide opportunities to make claims. **Claim Evidence Reasoning** **(Evidence Based Writing)**
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios

- Student Driven Instruction

Module: Earth's Surface

Stage 1 – Desired Results

ASSESSED FOCUS STANDARDS:

ESS2.B: Plate Tectonics and Large-Scale System Interactions

- Maps show where things are located. One can map the shapes and kinds of land and water in any area.

ESS2.C: The Roles of Water in Earth's Surface Processes

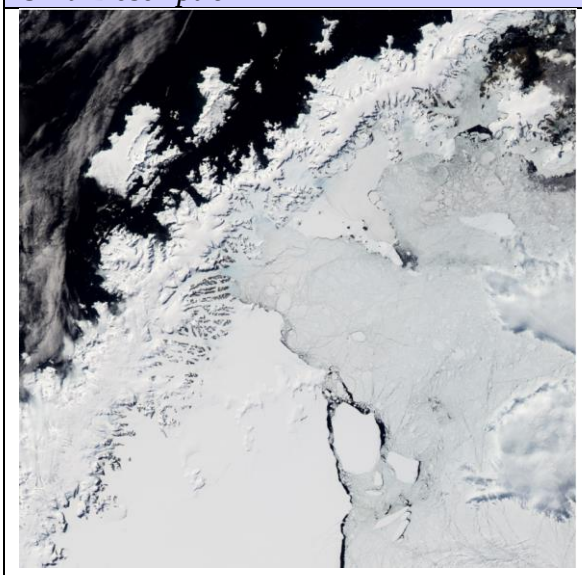
- Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form.

CONTENT CONNECTIONS:

Primary NJSLS ELA/Literacy Connections:

SL.2.5: Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when

Unit Description



Statement: Earth's surface is made of different landforms and bodies of water.
Observation/Demonstration/Experience: Photo of a polar ice cap.
Driving Question: How can we describe Earth's surface?

Meaning

ENDURING UNDERSTANDINGS

- Earth's surface is made up of two key features: landforms and bodies of water.
- Landforms are generally shaped by water and include everything from very large continents to small valleys.

ESSENTIAL QUESTIONS

- How can we describe Earth's surface?
- Where are Earth's oceans?
- Where is Earth's fresh water?

appropriate to clarify ideas, thoughts, and feelings. **W.2.6:** With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. **W.2.8:** Recall information from experiences or gather information from provided sources to answer a question. **Primary NJSLS Mathematics Connections:** **MP.2** Reason abstractly and quantitatively. **MP.4** Model with mathematics **2.NBT.A.3** Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	• Topographical maps show the characteristics of landforms, particularly elevation and shape. • Bodies of water include oceans, lakes, and rivers. • Most of Earth's water is salt water, found in the planet's oceans. • Oceans are made of salt water, and rivers consist of fresh water, while lakes can have either saltwater or freshwater. • Earth's surface is under constant changes due to factors such as weathering, the movement of glaciers, and plate tectonics. • Earth's oceans cover three-quarters of the planet. The four main ocean basins are the Pacific, Atlantic, Indian, and Arctic. • Exploring the oceans is challenging, but with current technology, scientists are able to map the ocean floor. • It has landforms similar to those above water, such as mountains, valleys, and plains. • Freshwater makes up only a small	

	percentage of the water on Earth but is essential to animal and plant life. Earth's freshwater is located in ponds, lakes, rivers, streams, and glaciers.	
	What students will know and be able to do	
	KNOWLEDGE **Lesson 1:** I can plan a model of Earth's surface. **Lesson 2:** I can locate oceans on a world map and understand that oceans are the main source of Earth's water.	**SKILLS** **2-ESS2-2.Develop a model to represent the shapes and kinds of land and bodies of water in an area.** [*Assessment Boundary: Assessment does not include quantitative scaling in models.*] **Developing and Using Models;** Patterns **2-ESS2-3.Obtain information to identify where water is found on Earth and that it can be solid or liquid.Obtaining, Evaluating, and Communicating Information**;Patterns

Stage 2 – Evidence

SUMMATIVE ASSESSMENT(S)

Performance Tasks:
Lesson 1: Make a Model of a Landform
Rubric
Lesson 2: Labeling Earth's Oceans
Rubric
Lesson 3: Make a Model of Fresh Water Movement
Rubric
Performance Project:
Polar Ice Cap Research
Rubric
Grade 2: eAssessment
STEM Gauge K-2

Claim Evidence Reasoning (Evidence Based Writing)

PRE-ASSESSMENT

Page Keeley Science Probe
Lesson 1:Mapping Earth's Surface
Lesson 2: Earth's Water
Lesson 3:Fresh Water

Integration of 21st Century Skills	Integration of Technology	Career Education
9.4.2.CI.1: Demonstrate openness to new ideas and perspectives. **9.4.2.CI.2:** Demonstrate originality and inventiveness in work. **9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem. **9.4.2.CT.2:** Identify possible approaches and resources to execute a plan. **9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).	**McGraw Hill Digital Resources via CLEVER** Science Songs K-2 Paired Read-Aloud Landforms Landforms on Earth Earth's Surface Vocabulary Where is most of Earth's water? Ocean Technology Waterfalls Freshwater Bodies of water Discovery Education Great lakes Now: Coastal Wetlands Virtual Field Trip Major lakes and rivers of the midwest. Lakes Natural Phenomena: Lakes, Rivers, and Other Water Sources Mystery Science If you floated down a river, where would you end up? Why is there sand at the beach? What's strong enough to make a canyon? How can you stop a landslide?	**Paleontologist:** Introduce Career Kid Jin, who wants to be a paleontologist when he grows up. A paleontologist studies fossils of living things that lived a very long time ago. **Ocean Engineer:** Introduce Career Kid Hiro, who wants to be an ocean engineer when he grows up

Stage 3 – Learning Plan

UNIT VOCABULARY

continent	**direction**	**freshwater**
hill	**globe**	**glacier**
island	**iceberg**	**lake**

landform	**map key**	**pond**
map	**ocean**	**river**
mountain	**salt water**	**stream**
plain	**symbol**	
valley		

SUMMARY OF KEY LEARNING

Lesson 1: Describe Earth's Surface

Lesson 1: Day 1 - Module Opener, Vocabulary, STEM career connection, Page Keeley Probe

- **Learning Intention:**
  - I am learning that Earth's surface is made up of many different landforms.
- **Success Criteria:**
  - I can create a list of questions about the phenomenon of a polar ice cap.
  - I can discuss the different ways water exists on Earth.
  - I can circle images of things that I might see on a map and explain my thinking**.**
- **Brief Overview of Lesson:**
  - Students are engaged through the phenomenon of a polar ice cap. The STEM career of a paleontologist is introduced. Prompt students to ask questions about their career. This lessons probe is intended to uncover students' basic ideas about how maps are used as models to show different features of Earth.

Lesson 1: Day 2 - Phenomenon, Essential Question Science and Engineering Practice

- **Learning Intention:**
  - I am learning that Earth's surface is made up of many different landforms.
- **Success Criteria:**
  - I can create a list of questions about the phenomenon of land.
  - I can discuss and share my thoughts about how water surrounds land.
  - I can circle images of things I can find on a map of Earth's Surface.
  - I can create a labeled model of land and water.
  - I can compare my model to my classmates.
- **Brief Overview of Lesson:**
  - Students are engaged through the phenomenon of a land surrounded by water. The STEM career of an ocean engineer is introduced. Prompt students to ask questions about the career. Students will also build a model that shows both land and water.

Lesson 1: Days 3-7 - Obtain and Communicate Information; *Inquiry Activity- Get Connected*
Reflect and Refine, Science and Engineering Practices

- **Learning Intention:**
  - I am learning that land has different shapes.
- **Success Criteria:**
  - I can use the lesson vocabulary to explain Earth's surfaces.
  - I can label and name the seven continents.
  - I can discuss and draw detailed labeled pictures of Earth's landforms.
  - I can research a landform and share my work with my classmates.

- **Brief Overview of Lesson:**
    - In the lesson students will be introduced to several vocabulary via slides. They will complete the *Landforms on Earth* Digital Interactive. Students will view and read about different examples of landforms. They will watch the video *Landforms*. The video reinforces the definitions of several landforms, including mountains, hills, valleys, plains, and islands.

Lesson 1: Day 8 - Research, Investigate and Communicate: Inquiry Activity; Create a model of a map.

- **Learning Intention:**
    - I am learning that maps show where landforms are located.
- **Success Criteria:**
    - I can create a model of a relief map.
    - I can research two interesting landforms and add them to the map.
- **Brief Overview of Lesson:**
    - Students will study a world map and create a relief map based on it. Students will use a piece of cardboard as the base of their map and add clay that they have shaped into continents.

Lesson 1: Days 9 & 10-Performance Task: *Make a Model of a Landform* and eAssessment.

- **Learning Intention:**
    - I am learning that Earth's surface is made up of many different landforms.
- **Success Criteria:**
    - I can create and label a model of a landform.
    - I can describe my landform to my classmates.
    - I can compare my model of a landform with my classmates.
    - I can discuss and share my claim with evidence based on the *EQ:How can we describe Earth's surface?*
    - I can demonstrate my learning by completing lesson one assessment.
- **Brief Overview of Lesson:** Students will build a model of a landform. Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: How can matter be arranged in different ways*?* Students will see whether and how their thinking has changed. Students will complete lesson one assessment.

Using the Leveled Readers: Different Kinds of Land

Summary This book explores different landforms, including mountains, valleys, plains, rain forests, and deserts.

When to Use Use this book in the Explain section of Lesson 1 after discussing the different types of landforms. This book serves as an introduction to landforms and how each is described. Help students understand that Earth is covered with many different landforms.

Lesson 2: Oceans

Lesson 2: Day 1 - Module Opener, Vocabulary, STEM career connection, Page Keeley Probe

- **Learning Intention:**
    - I am learning where most of Earth's water is found.
- **Success Criteria:**
    - I can explain to my classmates where most of Earth's water is found.
    - I can ask questions about the lesson phenomenon of the Earth.
    - I can discuss with my classmate what an Ocean Engineer does on a daily basis.

- **Brief Overview of Lesson:** Students are engaged through the phenomenon of the Earth. The STEM career of an Ocean Engineer is introduced. Prompt students to ask questions about this career. This lesson probe is intended to uncover students' basic ideas about the distribution of water on Earth.

Lesson 2: Day 2 - Inquiry Activity: Earth's Surface

- **Learning Intention:**
  - I am learning what mostly makes up Earth's surface.
- **Success Criteria:**
  - I can make a prediction about what Earth's surface is mostly made of.
  - I can color the continents and land on a map and discuss my finds with my classmates.
- **Brief Overview of Lesson:** Students will investigate what is on the surface of Earth.

Lesson 2: Days 3-7 - Obtain and Communicate Information, Ocean Research Reflect and Refine, Science and Engineering Practices

- **Learning Intention:**
  - I am learning that maps show Earth's features.
  - I am learning where most of earth's water is located.
  - I am learning that there are two types of technology that help scientists study the ocean (submersibles and satellites).
- **Success Criteria:**
  - I can research where an ocean is located and list five facts about the ocean.
  - I can create a word web using the lesson vocabulary.
  - I can complete, "*Where is most of Earth's Water"?* Digital interactive and discuss my findings with my teammate**.**
  - I can discuss some advantages of using a submersible with my classmates.
- **Brief Overview of Lesson:** Students will develop science vocabulary by reading *Maps showing Earth's features Science file.* They will complete the *Where is most of Earth's Water?* Digital Interactive. Learn about two types of technology that scientists use to study Earth. Students will conduct research on one of Earth's oceans.

Lesson 2: Day 8 - Research, Investigate and Communicate: Inquiry Activity; Create a model of a map.

- **Learning Intention:**
  - I am learning that the Earth has four oceans.
- **Success Criteria:**
  - I can create a model of a map and compare my model with my classmates.
- **Brief Overview of Lesson:** Students will create a model and add ocean information to their relief maps.

Lesson 2: Days 9&10-Performance Task: *Make a Model of a Landform* and eAssessment.

- **Learning Intention:**
  - I am learning that most of Earth's water is found in the oceans.
- **Success Criteria:**
  - I can make models to show the locations of Earth's oceans.
  - I can label Earth's oceans on a world map and create a question based on the information on my map.
  - I can discuss and share my claim with evidence based on the *EQ:Where are Earth's oceans?*
  - I can demonstrate my learning by completing lesson one assessment.
- **Brief Overview of Lesson:** Students will build a model to show the locations of Earth's oceans. Students will reflect on the lesson phenomenon and refer to the claim they wrote based on the essential

question: Where are Earth's oceans? Students will see whether and how their thinking has changed. Students will complete lesson two assessment.

Using The Leveled Readers: Water Habitats

Summary This book discusses a variety of water habitats and the animals that live in them.

When to Use this book in the Explain section in Lesson 2 and the Explain section in Lesson 3 after discussing ocean and freshwater habitats. This book serves as an introduction to the habitats and animals that live in them. Help students understand how the habitats differ.

Lesson 3: Fresh water

Lesson 3: Day 1 -Page Keeley Probe, Phenomenon, Essential Question Science and Engineering Practice

- **Learning Intention**:
  - I am learning about all of the places you can find fresh water.
- **Success Criteria:**
  - I can identify places where you can find freshwater and explain my thinking.
  - I can ask questions about the lesson phenomenon of the waterfall.
  - I can discuss with my classmate what an Ocean Engineer does on a daily basis.
- **Brief Overview of Lesson:**
  Students are engaged through the phenomenon of the waterfall. The STEM career of an Ocean Engineer is introduced. Prompt students to ask questions about this career. This lesson probe is intended to uncover students' basic ideas about freshwater and saltwater.

Lesson 3: Day 2-Inquiry Activity: Fresh water changes simulation and Paired Read Aloud: Vacation Surprise

- **Learning Intent**ion:
  - I am learning that fresh water changes with temperature.
- **Success Criteria:**
  - I can make a prediction about what will happen when fresh water moves down a mountain.
  - I can observe patterns in the mountain and record my data about what happens when the temperature changes.
  - I can explain how the temperature affects the movement of fresh water.
  - I can identify the following vocabulary (stream, lakes pond, and glacier) while listening to the paired read aloud.
  - I can discuss with my teammate some of the activities that Jarrett participated in with his dad on the trip.
- **Brief Overview of Lesson:**
  Students will adjust the temperature of a scene that includes a mountain, a river, and a lake. They will see that as the temperature increases, the snow and ice melt, and the water becomes warmer. As the temperature decreases, the water becomes much colder, more of the mountain becomes snow-covered, and the rivers and lakes turn to ice. At the coldest temperature, the entire scene shows snow and ice. Students will read about Jarrett and his vacation with his dad to Glacier National Park. While reading, students will encounter the vocabulary words: *stream, river, lake, pond*, and *glacier*.

Lesson 3: Days 3-7 - Obtain and Communicate Information: *Bodies of water, Water on Earth and Fresh water.*

- **Learning Intention:**
  - I am learning that freshwater can be found in (lake, ponds, streams, river).

- I am learning that there are various bodies of water and the types of water they are made of.

- **Success Criteria:**
  - I can match bodies of water with their definitions.
  - I can complete the bodies of water *digital interactive.*
  - I can explain the differences between a glacier and other bodies of freshwater.
  - I can construct a word web using the lesson's vocabulary words (fresh water, stream, river, lake, pond and glacier).
  - I can explain what happens after rainfalls to the ground.
- **Brief Overview of Lesson:**
  Students will develop vocabulary while exploring the bodies of water slides, digital interactive and the Visual Kinesthetic Vocabulary. Students will also read the science pair read aloud" to learn about various bodies of water.

Lesson 3: Day 8 & 9 - *Inquiry Activity: Model of a Glacier, Quick check*, Research, Investigate and Communicate: Inquiry Activity: Freshwater Research, Inquiry activity: Create a Model of a map.

- **Learning Intention:**
  - I am learning how fresh water moves down or around landforms.
  - I am learning that lakes and rivers are earth's surface bodies of water.
- **Success Criteria:**
  - I can choose a lake or river to research and describe its location on a map.
  - I can describe the unique features of the lake or river from research.
  - I can compare my research with my classmates to identify patterns.
  - I can draw a model of freshwater movement.
- **Brief Overview of Lesson:** Students will conduct research on a lake or a river. They will add lakes and rivers information to their relief maps.

Lesson 3: Days 10 & 11-Performance Task: Make a model of fresh water movement, Performance Project: Ice Polar Cap Research and eAssessment.

- **Learning Intention:**
  - I am learning that fresh water moves within a system**.**
- **Success Criteria:**
  - I can draw an outdoor model that includes one landform and three sources of freshwater.
  - I can label my model and include arrows that show how the water flows in the model.
  - I can discuss and share my claim with evidence based on the *EQ:Where is Earth's fresh water?*
  - I can demonstrate my learning by completing lesson three assessment.
- **Brief Overview of Lesson:** Students will make a model showing how fresh water moves. Students will reflect on the lesson phenomenon and refer to the answer they wrote based on the essential question: Where is Earth's Fresh water? Students will see whether and how their thinking has changed. Students will complete lesson one assessment.

CULTURALLY RESPONSIVE TEACHING in PRACTICE	**SOCIAL EMOTIONAL LEARNING in PRACTICE**
• Diversity in STEM: Nova: Secret Life of Scientist and Engineers) • Impact News Here you will find the latest topical and news stories in the world of science. • Helping Communities!	**Awareness of Self & Others: My Creative Strengths** Self-knowledge is the ability to understand one's own interests, feelings, weaknesses, and strengths, as well as learning and relating styles. Self-knowledge is the starting point for all social and emotional learning. In fact, self-

• Science News & Science News for students • -warmest year • 8 projects bringing safe, sustainable water sources to communities around the world • The Island Name after a satellite. • Our island, our paradise • Girls in STEM	knowledge influences all areas of SEL including self-management, social awareness, relationship skills, and responsible decision-making. **Self-knowledge** helps students to know when they are on the right path and are making decisions that are aligned with who they are. It also can serve as a guide when students are going against their own strengths, styles, personalities, and purpose and help students re-align with who they are. The more a student understands him or herself, the better he or she will grow and adapt in all areas of life. **Self-Management:**Focus First! -Students will identify distractions and advocate for themselves in order to focus better in class. **Self-Management:**If at First You Don't Succeed... Students will practice strategies for persistence. **Self-Management:** Reach Your Goal-Students will identify a personal goal and the steps to achieve it. **Self-Management:** You Can Change It! Students will learn strategies for changing feelings, thoughts, and behaviors in stressful situations. **Self-Care:** I Believe in Me! Students will develop strategies for building belief to reach a goal**.** Self-efficacy is the belief in oneself. A student's self-efficacy greatly influences his or her academic motivation, learning, and achievement. Therefore, it is imperative that teachers address students' self-efficacy. Going-beyond-how-are-you-feeling This article focuses on:When students have the language to describe their feelings

	and needs, they are better equipped to help themselves and each other. Edutopia.org-Article/helping-students-process-their-feelings-during-remote-learning Why is it Important to Accept Others?

Lesson 1:	**Describe Earth's Surface**	**Estimated Time: 9 days**

In this module, students will develop models and obtain and use information to explore landforms, oceans, and bodies of fresh water on Earth's surface, identifying these features on maps. Students will engage in scientific experiences to answer Essential Questions such as: How can we describe Earth's surface? Where are Earth's oceans? Where is Earth's fresh water? What can we learn from maps?

What students should know and be able to do to engage in this lesson:

- Students will make initial explanations and formulate questions that will be investigated throughout the lesson by observing a photo of a polar ice cap.
- Students will describe Earth's surface by identifying phenomena that occur on Earth.
- Students will build a model by showing both land and water.
- Students will view and read about different examples of landforms by engaging in *Earth* Digital Interactive activity.
- Students will draw examples of different landforms by using the key details from the Science Paired Read Aloud, *Earth's Surface.*
- Students will reference read aloud and video to describe different attributes of land by using vocabulary words identified in the text.
- Students will make a relief map by conducting an investigation.
- Students will build a model of a landform by conducting an investigation.
- Students will share their observations from investigation by comparing and contrasting their models with their classmates' models.
- Students will revisit the lesson's essential question and their thinking by referring back to previously recorded answers and discussing.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
ESS2.B: Plate Tectonics and Large-Scale System Interactions • Maps show where things are located. One can map the shapes and kinds of land and water in any area. **ESS2.C: The Roles of Water in Earth's Surface Processes** • Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form.	Preschool Learning Outcomes Standard 5.4: Children observe and investigate the Earth Explore and describe characteristics of soil, rocks, water, and air (e.g., sorting rocks by shape and/or color, observing water as a solid

	and a liquid, noticing the wind's effect on playground objects).
Focus Question for this Lesson	
How can we describe Earth's surface?	
Learning Intention	**Success Criteria**
<u>Day 1:</u> ● I am learning that Earth's surface is made up of many different landforms. **<u>Day 2:</u>** ● I am learning that Earth's surface is made up of many different landforms. **<u>Days 3-7:</u>** ● I am learning that land has different shapes. **<u>Day 8:</u>** ● I am learning that maps show where landforms are located. **<u>Days 9 and 10</u>**: ● I am learning that Earth's surface is made up of many different landforms.	**<u>Day 1:</u>** ● I can create a list of questions about the phenomenon of a polar ice cap. ● I can discuss the different ways water exists on Earth. ● I can circle images of things that I might see on a map and explain my thinking**.** **<u>Day 2:</u>** ● I can create a list of questions about the phenomenon of land.. ● I can discuss and share my thoughts about how water surrounds land. ● I can circle images of things I can find on a map of Earth's Surface. ● I can create a labeled model of land and water. ● I can compare my model to my classmates. **<u>Days 3-7:</u>** ● I can use the lesson vocabulary to explain Earth's surfaces. ● I can label and name the seven continents. ● I can discuss and draw detailed labeled pictures of Earth's landforms. ● I can research a landform and share my work with my classmates. **<u>Day 8:</u>** ● I can create a model of a relief map. ● I can research two interesting landforms and add them to the map. **<u>Days 9 and 10:</u>** ● I can create and label a model of a landform. ● I can describe my landform to my classmates.

	• I can compare my model of a landform with my classmates. • I can discuss and share my claim with evidence based on the *EQ:How can we describe Earth's surface?* • I can demonstrate my learning by completing lesson one assessment.

Assessment(s)

Performance Tasks:
Lesson 1: Make a Model of a Landform
Rubric
Page Keeley Science Probe
Lesson 1:Mapping Earth's Surface

Grade 2: eAssessment

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Students may have misconceptions about landforms that are not in their immediate area. For example, if there are no mountains nearby, students may believe that all mountains are just tall rocky landforms whose tops are covered with snow.
- Help students understand that plants, such as trees and flowers, may grow on a mountain and that people may live and work on mountains.
- Students may not have experience with bodies of saltwater or bodies of freshwater. They may not recognize that there are different types of water.
- Students may think that landforms and bodies of water exist independently of each other and may not understand how they influence each other.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA – https://wida.wisc.edu/teach/can-do/descriptors*

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- Word walls

- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
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  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios
  - Student Driven Instruction

Lesson 2:	**Oceans**	**Estimated Time: 10 days**

Brief Overview of Lesson: The focus of this lesson is that Earth is covered by an ocean. A globe or a map shows that most of Earth's surface is covered by an ocean, which is usually divided into the Pacific, Atlantic, Indian, Arctic, and Southern Oceans. Students will develop a model of Earth's ocean and show where each named ocean is located.

What students should know and be able to do to engage in this lesson:

- **Day 1:** Students will explore the phenomenon of Earth by formulating questions to investigate throughout the lesson.
- **Day 2:** Students will investigate what is on the surface of Earth by making a prediction and carrying out an investigation.

- **Day 3:** Students will find out what can be learned from maps and how to use them by reading the *Maps Show Earth's Features* Science File.
- **Day 4:** Students will learn about two types of technology that scientists use to study Earth, including its oceans by watching the video *Ocean Technology*.
- **Day 5:** Students will conduct research on one of Earth's oceans by collecting evidence through their investigation.
- **Day 6:** Students will add ocean information to their relief maps by labeling attributes of the Earth's oceans.
- **Day 7:** Students will make a model to show the locations of Earth's oceans by completing the Performance Task, *Earth's Oceans*.
- **Day 8:** Students will compare and contrast their model with their classmates' model by sharing their observations from the performance task.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
ESS2.B: Plate Tectonics and Large-Scale System Interactions • Maps show where things are located. One can map the shapes and kinds of land and water in any area. **ESS2.C: The Roles of Water in Earth's Surface Processes** • Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form.	Preschool Learning Outcomes Standard 5.4: Children observe and investigate the Earth Explore and describe characteristics of soil, rocks, water, and air (e.g., sorting rocks by shape and/or color, observing water as a solid and a liquid, noticing the wind's effect on playground objects).

Focus Question for this Lesson

Where are Earth's oceans?

Learning Intention	**Success Criteria**
Day 1: • I am learning where most of Earth's water is found. ***Day 2:*** • I am learning what mostly makes up Earth's surface. ***Days 3-7:*** • I am learning that the following vocabulary words useful when explaining the ocean (globe, symbol, direction, ocean, saltwater) • I am learning that maps show Earth's features. • I am learning where most of earth's water is located.	***Day 1:*** • I can explain my things as to where most of Earth's water is found. • I can ask questions about the lesson phenomenon of the Earth. • I can discuss with my classmate what an Ocean Engineer does on a daily basis. ***Day 2:*** • I can make a prediction about what Earth's surface is mostly made of. • I can color the continents and land on a map and discuss my finds with my classmates. ***Days 3-7:*** • I can research where an ocean is located and list five facts about the ocean.

● I am learning that there are two types of technology that help scientists study the ocean (submersibles and satellites). ***Day 8:*** ● I am learning that the Earth has four oceans. ***Days 9 & 10:*** ● I am learning that most of Earth's water is found in the oceans.	● I can create a word web using the lesson vocabulary. ● I can complete, "*Where is most of Earth's Water"?* Digital interactive and discuss my findings with my teammate**.** ● I can discuss some advantages of using a submersible with my classmates. ***Day 8:*** ● I can create a model of a map and compare my model with my classmates. ***Days 9 & 10:*** ● I can make models to show the locations of Earth's oceans. ● I can label Earth's oceans on a world map and create a question based on the information on my map. ● I can discuss and share my claim with evidence based on the *EQ:Where are Earth's oceans?* ● I can demonstrate my learning by completing lesson one assessment.

Assessment(s)

Self-Assessment/Peer Assessment/Teacher Assessment

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

Students may think Earth's oceans are all the same. However, oceans can be solid (frozen) or liquid. Students may also think the ocean floor is flat, like a plain. Explain that the bottom of the ocean is called the ocean floor and that it has natural structures like those on land, such as mountains, valleys, and plains. Students may think that ocean water can be drunk or used to water plants. Help students recognize the difference between saltwater and freshwater.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications: *Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. Students will be supported according to the recommendations for "can do's" as outlined by WIDA –* *https://wida.wisc.edu/teach/can-do/descriptors*

- Speak and display terminology
- Teacher modeling
- Peer modeling
- Provide ELL students with multiple literacy strategies.
- Word walls
- Use peer readers
- Give page numbers to help the students find answers
- Provide a computer for written work
- Provide two sets of textbooks, one for home and one for school

Special Needs:

- Use highlighter to guide students answering questions
- Reduce the number of questions a student answers (i.e., if there are 10 questions, some students may only answer 7 questions)
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- Provide students with a picture, word and/or sentence bank. Students can use the answer bank options to draw and write or they can cut and paste their answers into the answer box.
- Provide students with images they can cut and paste into their notebook.

Gifted and Talented: *Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out investigations and analyzing and interpreting data.*

- Students can present what they have learned to the entire group.
- Independent projects can be assigned on the basis of ability level
- Encourage creativity and original thinking.
- Provide opportunities to make claims. **Claim Evidence Reasoning** **(Evidence Based Writing)**
- Plan for tiered learning
- Curriculum compacting
  - Inquiry-based instruction
  - Independent study
  - Higher order thinking skills
  - Adjusting the pace of lessons
  - Interest based content
  - Real world scenarios
  - Student Driven Instruction

Lesson 3:	**Fresh Water**	**Estimated Time: 10 days**

Brief Overview of Lesson: The focus of this lesson is the location of Earth's fresh water. Earth's freshwater is found in lakes, ponds, rivers, streams, and glaciers. Students will research and develop a model to show where freshwater is located and how fresh water moves.

What students should know and be able to do to engage in this lesson:

- **Day 1:** Students will explore the phenomenon of a waterfall by formulating questions to investigate throughout the lesson.
- **Day 2:** Students will determine how fresh water changes with temperature by engaging in an investigation simulation.
- **Day 3:** Students will utilize vocabulary words by identifying and reading them in the Science Paired Read Aloud, *Vacation Surprise.*
- **Day 4:** Students will explain how freshwater is used by completing the *Bodies of Water* Digital Interactive.
- **Day 5:** Students will learn about various bodies of water on Earth and the types of water they are made of by listening to the Science Paired Read Aloud, *Water on Earth.*
- **Day 6:** Students will make a model of a glacier by conducting an investigation.
- **Day 7:** Students will add lake and river information to their relief maps by completing the Inquiry Activity, *Create a Model of a Map.*
- **Day 8:** Students will make a model showing how fresh water moves by participating in the Performance Task, *Model of Fresh Water Movement*.
- **Day 9:** Students will share their observations by comparing and contrasting their models with their classmates' models.
- **Day 10:** Students will conduct research on polar ice caps and where to find solid ice on Earth by completing the Performance Project, *Polar Ice Cap Research*

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
ESS2.B: Plate Tectonics and Large-Scale System Interactions • Maps show where things are located. One can map the shapes and kinds of land and water in any area. **ESS2.C: The Roles of Water in Earth's Surface Processes** • Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form.	Preschool Learning Outcomes Standard 5.4: Children observe and investigate the Earth Explore and describe characteristics of soil, rocks, water, and air (e.g., sorting rocks by shape and/or color, observing water as a solid and a liquid, noticing the wind's effect on playground objects).

Focus Question for this Lesson

Where is Earth's fresh water?

Learning Intention	**Success Criteria**
Day 1: • I am learning about all of the places you can find fresh water. ***Day 2:*** • I am learning that fresh water changes with temperature. ***Days 3-7*** • I am learning that freshwater can be found in (lake, ponds, streams, river).	***Day 1:*** • I can identify places where you can find freshwater and explain my thinking. • I can ask questions about the lesson phenomenon of the waterfall. • I can discuss with my classmate what an Ocean Engineer does on a daily basis. ***Day 2:***

● I am learning that there are various bodies of water and the type of water they are made of. ***Days 8 & 9):*** ● I am learning how fresh water moves down or around landforms. ● I am learning that lakes and rivers are earth's surface bodies of water. ***Days 10 & 11:*** ● I am learning how fresh water moves within a system**.**	● I can make a prediction about what will happen when fresh water moves down a mountain. ● I can observe patterns in the mountain and record my data about what happens when the temperature changes. ● I can explain how the temperature affects the movement of fresh water. ● I can identify the following vocabulary (stream, lakes pond, and glacier) while listening to the paired read aloud. ● I can discuss with my teammate some of the activities that Jarrett participated in with his dad on the trip. ***Days 3-7*** ● I can match bodies of water with their definitions. ● I can complete the bodies of water *digital interactive.* ● I can explain the difference between a glacier and other bodies of freshwater. ● I can construct a word web using the lessons vocabulary words (fresh water, stream, river, lake, pond and glacier) ● I can explain what happens after rain falls to the ground. ***Days 8 & 9:*** ● I can choose a lake or river to research and describe its location on a map. ● I can describe the unique features of the lake or river from research. ● I can compare my research with my classmates to identify patterns. ● I can draw a model of freshwater movement ***Days 10 & 11:*** ● I can draw an outdoor model that includes one landform and three sources of freshwater. ● I can label my model and include arrows that show how the water flows in the model. ● I can discuss and share my claim with evidence based on the *EQ:<u>Where is Earth's fresh water?</u>* ● I can demonstrate my learning by completing lesson three assessment.
Assessment(s)	
Self-Assessment/Peer Assessment/Teacher Assessment	

Feedback (Peer to peer/student to teacher/teacher to student)

- Student self-regulation or self-monitoring: Reflection sheet
- Peer Evaluation: Used to facilitate effective teamwork, student peers can provide feedback to each other on their performance as team member
- Lesson Trackers: Students are motivated by recording and reflecting upon their progress.

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

Students may not be aware that there is a limited quantity of freshwater on the planet. Students may not be aware that freshwater can become snow or ice and vice versa. Students may think rivers and lakes are made of the same type of water as oceans. Students may not realize that snow, ice, and rain affect lakes and rivers. Students may not realize that drinking water is the same type of water as is found in lakes and rivers and does not come from oceans. Point out to students that drinking water goes through a cleaning process to make it safe to drink. Water that comes from a well or a spring is usually not treated.

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