Kindergarten Science Curriculum

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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.

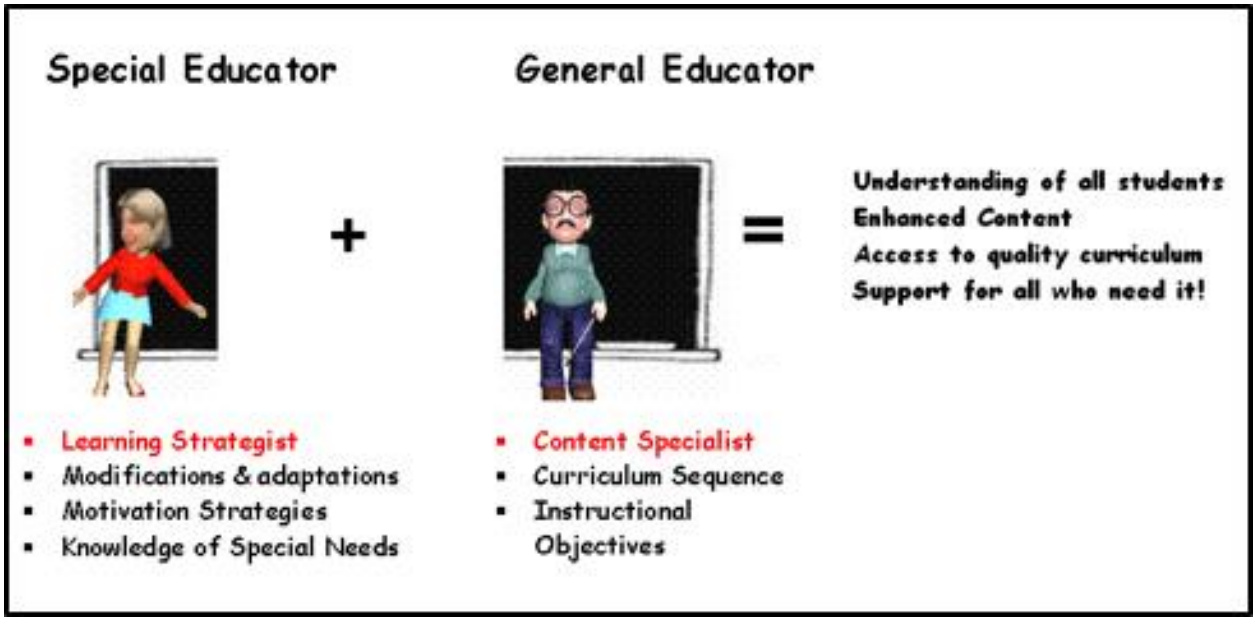
Our curriculum draws on the backgrounds, identities, and experiences of our students to make their connections to learning relevant and meaningful. Understanding the role of culture in the process of education means thinking about the ways identity (race, ethnicity, gender, sexual orientation, language, 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 curriculum, 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 applies 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

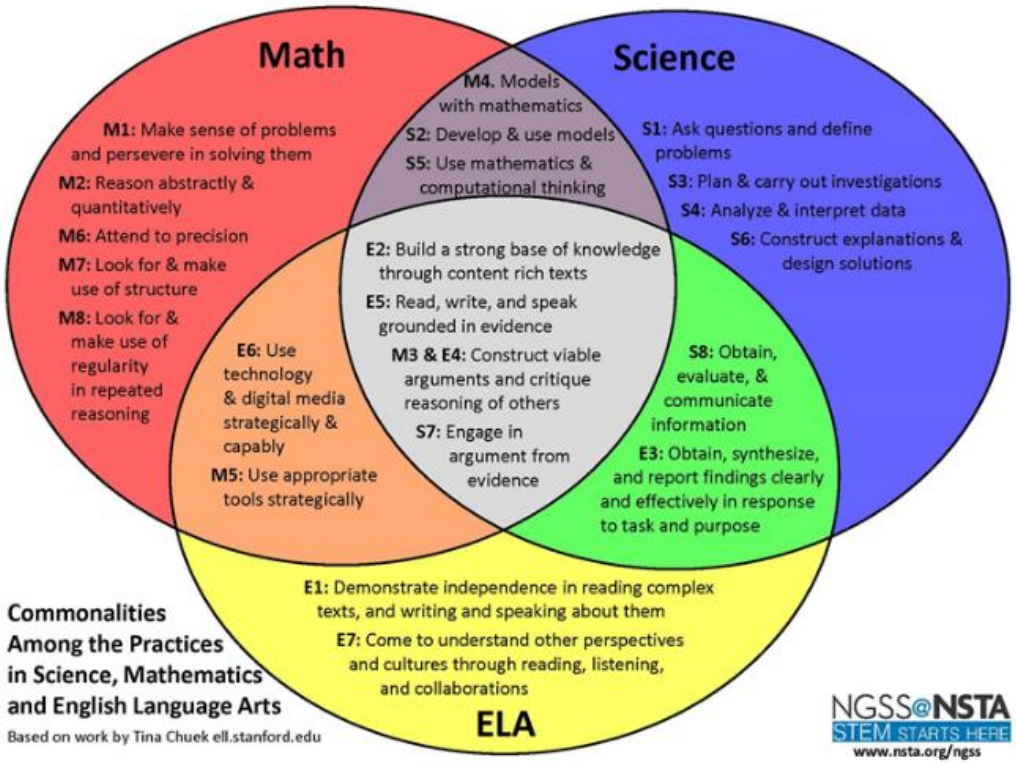
Core Instructional Materials

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:** Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.
- **9.1.4.A.2:** Evaluate available resources that can assist in solving problems.
- **9.1.4.A.3:** Determine when the use of technology is appropriate to solve problems.
- **9.1.4.A.4:** Use data accessed on the Web to inform solutions to problems and the decision-making process.
- **9.1.4.A.5:** Apply critical thinking
- **9.1.4.B.1:** Participate in brainstorming sessions to seek information, ideas, and strategies that foster creative thinking.
- **9.1.4.D.1:** Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
- **9.1.4.E.2:** Demonstrate effective communication using digital media during classroom activities.
- **9.3.4.A.2:** Identify various life roles and civic and work-related activities in the school, home, and community.
- **9.3.4.A.3:** Appraise personal likes and dislikes and identify careers that might be suited to personal likes.
- **9.3.4.A.4:** Identify qualifications needed to pursue traditional and nontraditional careers and occupations.
- **9.3.4.A.5:** Locate career information using a variety of resources.

Office of Teaching and Learning
Kindergarten Science

Course Description

Students in kindergarten formulate answers to questions such as: “What happens if you push or pull an object harder? Where do animals live and why do they live there? What is the weather like today and how is it different from yesterday?” Students are able to apply an understanding of the effects of different strengths or different directions of pushes and pulls on the motion of an object to analyze a design solution. Students develop understandings of what plants and animals (including humans) need to survive and the relationship between their needs and where they live. Students develop understandings of patterns and variations in local weather and the purpose of weather forecasting to prepare for, and respond to, severe weather. The crosscutting concepts of patterns; cause and effect; systems and system models; interdependence of science, engineering, and technology; 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 asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, 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	Force and Motion	Weather	Plants and Animals	Energy and the Sun	Impacts on Earth’s Systems	Protecting Our Earth
K-PS2-1: Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.	✓					
K-PS2-2: Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.	✓					
K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.			✓			

K-ESS2-1: Use and share observations of local weather conditions to describe patterns over time.		✓				
K-ESS2-2: Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.					✓	
K-ESS3-1: Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.			✓			
K-ESS3-2: Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.		✓				
K-ESS3-3: Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.						✓
K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.		✓				
K-2-ETS1-2: Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.						✓
K-PS3-1: Make observations to determine the effect of sunlight on Earth's surface.				✓		
K-PS3-2: Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on Earth's surface.				✓		

Pacing Guide

This guide is based on science being taught every day for 50 minutes

Modules		Standards Areas	Pacing (# of lessons, # of days)
1	**Force and Motion**	• K-PS2-1 Motion and Stability: Forces and Interactions • K-PS2-2 Motion and Stability: Forces and Interactions	**3 lessons/27 days**
2	**Energy and the Sun**	• K-PS3-1 Energy • K-PS3-2 Energy	**2 lessons/24 days**
3	**Plants and Animals**	• K-LS1-1 From Molecules to Organisms: Structures and Processes • K-ESS3-1 Earth and Human Activity	**3 lessons/33 days**
4	**Weather**	• K-ESS2-1 Earth's Systems • K-ESS3-2 Earth and Human Activity • K-2-ETS1-1 Engineering Design	**3 lessons/33 days**
5	**Impacts on Earth's Systems**	• K-ESS3-2 Earth and Human Activity	**3 lessons/27 days**
6	**Protecting Our Earth**	• K-ESS3-3 Earth and Human Activity • K-2-ETS1-2 Engineering Design	**3 lessons/31 days**

Module 1:
Force and Motion

Stage 1 – Desired Results

ASSESSED FOCUS STANDARDS:

PS2.A: Forces and Motion
- Pushes and pulls can have different strengths and directions.
- Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.

PS2.B: Types of Interactions
- When objects touch or collide, they push on one another and can change motion.

CONTENT CONNECTIONS:

ELA/Literacy
- RI.K.1 With prompting and support, ask and answer questions about key details in a text.
- SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

Mathematics
- MP.2 Reason abstractly and quantitatively.
- K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
- K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.

Unit Description

Anchoring Phenomenon: A toy train pulling freight cars over a hill.
Statement: A train is able to pull heavy objects over hills.
Observation/Demonstration/Experience: Photo of toy train pulling freight cars over a hill.

Driving Question: How do pushes and pulls affect the way objects move?

Meaning

ENDURING UNDERSTANDINGS:
- A force is a push or a pull.
- Motion occurs when an object changes position relative to another object.
- When an object changes position, it has moved a distance.

ESSENTIAL QUESTIONS:
- How do pushes and pulls affect the way objects move?
- What happens when objects touch or collide?
- How can pushes and pulls change an object's direction?

	● A push or a pull can cause an object to start moving, change direction, or stop moving. ● Speeding up, slowing down, stopping, starting, and changing direction are all changes in motion. In the ● A collision with another object can also change its motion. ● The stronger the force of a push or pull, the greater the change in speed of the objects. ● The change in motion can change the direction the object was traveling.	
	What students will know and be able to do	
	KNOWLEDGE: ● Students will conduct an investigation and make observations to learn the effects of pushes and pulls on an object. (Lesson 1) ● Students will conduct investigations and make observations to explain how objects change direction after a collision. (Lesson 2) ● Students will investigate how objects can change direction with a push or a pull. (Lesson 3)	**SKILLS:** ● **K-PS2-1:** Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. ○ [Clarification Statement: Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other.] [Assessment Boundary: Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include non-contact pushes or pulls such as those produced by magnets.] ○ With guidance, plan and conduct an investigation in collaboration with peers. ○ Simple tests can be designed to gather evidence to support or refute student ideas about causes. ● **K-PS2-2:** Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.* ○ [Clarification Statement: Examples of problems requiring a solution could

		include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions could include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn.] [Assessment Boundary: Assessment does not include friction as a mechanism for change in speed.] ○ Analyze data from tests of an object or tool to determine if it works as intended. ○ Simple tests can be designed to gather evidence to support or refute student ideas about causes.

Stage 2 – Evidence

SUMMATIVE ASSESSMENT(S)

- Performance Task - A Moving Car (Lesson 1)
- Forces and Motion Lesson 1 Test
- Performance Task - Balls Colliding (Lesson 2)
- Forces and Motion Lesson 2 Test
- Performance Task - Using a Pulley (Lesson 3)
- Forces and Motion Lesson 3 Test
- Forces and Motion Module Performance Project - Design a Solution
  - Forces and Motion Module Performance Project - Design a Solution Rubric
- Forces and Motion Module Test
- STEM Gauge #477023
- STEM Gauge #471246
- STEM Gauge #505017

Copy of CER Framework Grade K

PRE-ASSESSMENT

- Page Keeley Science Probe - Push or Pull? (Lesson 1)
- Page Keeley Science Probe - Toy Car Crash (Lesson 2)
- Page Keeley Science Probe - Changing Direction (Lesson 3)

Integration of 21st Century Skills	Integration of Technology	Career Education

• **9.1.4.A.1:** Recognize a problem and brainstorm ways to solve the problem individually or collaboratively. • **9.1.4.A.2:** Evaluate available resources that can assist in solving problems. • **9.1.4.A.3:** Determine when the use of technology is appropriate to solve problems. • **9.1.4.A.4:** Use data accessed on the Web to inform solutions to problems and the decision-making process. • **9.1.4.A.5:** Apply critical thinking • **9.1.4.B.1:** Participate in brainstorming sessions to seek information, ideas, and strategies that foster creative thinking. • **9.1.4.D.1:** Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience. • **9.1.4.E.2:** Demonstrate effective communication using digital media during classroom activities. • **9.3.4.A.2:** Identify various life roles and civic and work-related activities in the school, home, and community. • **9.3.4.A.3:** Appraise personal likes and dislikes and identify careers that might be suited to personal likes. • **9.3.4.A.4:** Identify qualifications needed to pursue traditional and nontraditional careers and occupations. • **9.3.4.A.5:** Locate career information using a variety of resources.	• **Inspire Science Videos** ○ Pushes and Pulls ○ When Objects Collide • **Inspire Science Digital Interactives** ○ Pushes and Pulls ○ Objects Colliding ○ Marble Maze • **Inspire Science Songs** ○ Push and Pull • **Discovery Education** ○ Motion, Force, and Gravity • **Mystery Science** ○ What's the Biggest Excavator? ○ Why Do Builders Need So Many Big Machines? ○ How Can You Knock Down a Wall Made of Concrete? ○ How Can You Knock Down the Most Bowling Pins? ○ How Can We Protect a Mountain Town From Falling Rocks? ○ How Could You Invent a Trap? • **Generation Genius** ○ Pushes and Pulls ○ Simple Machines • **Google Classroom Virtual Assignments** • **Bill Nye "Motion" Video** ○ Motion • **Science Max** ○ Forces and Motion	• **Construction Manager:** ○ Introduce Career Kid Finn, who wants to be a construction manager when he grows up. A construction manager is in charge of a building site. Tools are used for building. Construction managers need to know how to use these tools. • **Carpenter:** ○ Introduce Career Kid Chloe, who wants to be a carpenter when she grows up. A carpenter builds things. Carpenters use tools, such as hammers to build. • **Automotive Engineer:** ○ Introduce Career Kid Riley, who wants to be an automotive engineer when she grows up. An automotive engineer designs cars, trucks and other automobiles. They have to know how and why objects move. • **Statistician:** ○ Introduce Career Kid CJ, who wants to be a statistician when he grows up. Statisticians collect data. They analyze the data. This helps solve problems.
Stage 3 – Learning Plan		
UNIT VOCABULARY		
• Collide • Force • Pull	• Direction • Motion • Push	• Distance • Position • Speed
SUMMARY OF KEY LEARNING		

Lesson 1: Pushes and Pulls

Lesson 1: Day 1 - Pushes and Pulls - Module Opener

- **Learning Intention:** I am learning that pushes and pulls affect the way objects move. I am learning about the phenomenon of a toy train pulling freight cars over a hill.
- **Success Criteria:** I can make initial explanations by observing a photo of a toy train pulling freight cars over a hill. I am learning to describe the STEM Career Connection of a Construction Manager.
- **Brief Overview of Lesson:** Students will observe a photo of a toy train pulling freight cars over a hill and make initial explanations (*hopefully* explanations that will be supported throughout the lesson). Students will also be introduced to the **Career Connection** of a *Construction Manager* and answer questions in their notebook.

Lesson 1: Day 2 and 3 - Pushes and Pulls - Assess and Engage

- **Learning Intention:** I am learning the effects of a push and a pull. I am learning about the phenomenon of a hammer hitting a nail.
- **Success Criteria:** I can ask questions about the phenomenon and what I want to learn about it. I can discuss my explanations of the phenomenon by observing a video. I can explain my reasoning through writing a response to the Page Keeley Science Probe which is supported by evidence. *(Students will not be given the answer at this time in the lesson, and as such, success should be measured by the questions that students ask about the phenomenon.)*
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Push or Pull?* This is intended to serve as a pre-assessment and uncover students' basic ideas about motion and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a hammer hitting a nail* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will also be introduced to the **Career Connection** of a *Carpenter* and answer questions in their notebook.

Lesson 1: Day 4 and 5 - Pushes and Pulls - Explore

- **Learning Intention:** I am learning the effects of a push and a pull.
- **Success Criteria:** I can discuss ways to move objects by listening to the read aloud, *Queen of the Hill.* I can notice that a similar push to each hanging bag of marbles will move the lighter bag of marbles easier and farther than a push will move the heavy bag. I can notice when I pull the two bags, the lighter bag will move easier with a pull than the heavier bag.
- **Brief Overview of Lesson:** Students will listen to a read-aloud of the fiction selection *Queen of the Hill*. This story is about a colony of ants that must investigate how to move a large rock. Before reading, students will describe some ways they might have had to work together to move something large, such as a table or bench. Students will investigate the effect of a push and a pull on a heavy and a light bag of marbles. They will observe the difference each force has on objects of different weights. They will have the opportunity to change the strength of the push and the pull and observe the differences.

Lesson 1: Days 6, 7 and 8 - Pushes and Pulls - Explain

- **Learning Intention:** I am learning the difference between a push and pull. I am learning the vocabulary (motion, position, push and pull).
- **Success Criteria:** I can describe the difference between a push and a pull using newly developed vocabulary. I can decide whether to change or justify my response by revisiting the Page Keeley Science Probe. I can identify and describe the difference between a push and a pull by engaging in various activities.
- **Brief Overview of Lesson:** Students will be introduced to vocabulary that will help them to understand the lesson content. Teacher will read the vocabulary words aloud while students circle the words they have heard before in their notebooks. Students will demonstrate understanding of a *push* and a *pull* by using their pencil/eraser to the actions. Teacher will perform a read-aloud called *Pushes and Pulls*, and students will learn how forces cause motion. Students will watch a short video and complete a **Digital Interactive** about pushes and pulls. The teacher will complete a

read-aloud of a short **Science File** about pushing and pulling, and students will complete an activity in their notebook identifying examples of pushes and pulls. Students will revisit the **Page Keeley Science Probe** to change or justify their initial responses from the beginning of the lesson. Finally, students will listen to a **Science Song** and describe to a partner what they have learned about pushes and pulls, using the song lyrics.

Lesson 1: Day 9 and 10 - Pushes and Pulls - Elaborate and Evaluate

- **Learning Intention:** I am learning the different strengths of pushes and pulls.
- **Success Criteria:** I can complete the task of moving a wagon by applying different strengths of pushes and pulls. I can use what I have learned about pushes and pulls to move a toy car by completing the **Performance Task**, *A Moving Car*.
- **Brief Overview of Lesson:** Students will apply different strengths of pushes and pulls to move a wagon in a **Digital Interactive**. They will begin by making predictions about what they think will happen. The teacher will remind students that a prediction is a statement of what they expect to observe in the future. Students will explain their predictions based on previous observations and then complete the **Inquiry Activity**. Students will complete a **Performance Task** and record their data in their notebooks. Finally, students will complete a short assessment covering the content from the lesson.

Lesson 2: When Objects Collide

Lesson 2: Day 1 and 2 - When Objects Collide - Assess and Engage

- **Learning Intention:** I am learning that objects change direction after a collision. I am learning about the phenomenon of a soccer player.
- **Success Criteria:** I can ask questions about the phenomenon and what I want to learn about it.
  I can discuss my explanations of the phenomenon by observing a video.
  I can choose a friend that I think has the best idea about what will happen when the cars collide by completing the Page Keeley Science Probe. I can make observations about the phenomenon of a soccer player.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Toy Car Crash.* This is intended to serve as a pre-assessment and uncover students' basic ideas about objects colliding and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a soccer player* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will also be introduced to the **Career Connection** of an *Automotive Engineer* and answer questions in their notebook.

Lesson 2: Day 3 - When Objects Collide - Explore

- **Learning Intention:** I am learning the effects on two moving objects when they collide.
- **Success Criteria:** I can describe the effects of different marbles colliding with each other.
- **Brief Overview of Lesson:** Students will investigate what happens when different marbles collide by completing an **Inquiry Activity**, *Marbles Collide*. Students will make a prediction prior to the **Inquiry Activity**, *Marbles Collide*. The teacher will remind students that a prediction is a statement of what they expect to observe in the future. Students will also draw what they predict to happen. Students will roll two same-sized marbles into one another to observe what happens when they collide. They will notice their direction changes. Teacher will read aloud the directions and students will draw to record what they observed. Students will share their observations and data with their classmates and answer questions based on those observations.

Lesson 2: Day 4 and 5 - When Objects Collide - Explain

- **Learning Intention:** I am learning that size can affect the direction and speed of objects.

- **Success Criteria:** I can answer guided comprehension questions about the text, *When Things Collide.* I can observe how size can affect the direction and speed of objects. I can draw what I think the effect will be of the objects colliding and then discuss my observations with a partner.
- **Brief Overview of Lesson:** Students will be introduced to vocabulary that will help them to understand the lesson content. Teacher will read the vocabulary words aloud while students circle the words they have heard before in their notebooks. The teacher will perform a read-aloud called *When Things Collide*, and students will learn how size can affect the direction and speed of objects. Students will watch a short video and complete a **Digital Interactive** about things colliding. The teacher will assess student understanding by asking questions throughout. Students will revisit the **Page Keeley Science Probe** to change or justify their initial responses from the beginning of the lesson. Finally, students will listen to a **Science Song** and describe to a partner what they have learned about pushes and pulls, using the song lyrics.

Lesson 2: Day 6 - When Objects Collide - Elaborate

- **Learning Intention:** I am learning that changing the force of a push changes the effect of a collision.
- **Success Criteria:** I can observe and describe how changing the force of a push, changes the effect of a collision by carrying out an investigation.
- **Brief Overview of Lesson:** Students will complete an **Inquiry Activity,** *Bottle Bowling.* Prior to the investigation, students will make a prediction and share with their classmates. Students will complete the **Inquiry Activity** making observations throughout the investigation. During the activity, students will observe how changing the force of a push changes the effect of a collision. Students will identify how the force of their push changed the speed at which the bottles moved away from the ball. Students will draw their observations in their notebooks. The teacher will wrap-up this activity by asking students to answer a question based on the investigation and share their observations with a partner.

Lesson 2: Day 7 - When Objects Collide - Evaluate

- **Learning Intention:** I am learning that the size of an object can affect its motion when it collides with another object.
- **Success Criteria:** I can investigate how two balls of different sizes move after they collide with one another. I can demonstrate how bigger balls will move farther when they collide with each other than the smaller balls.
- **Brief Overview of Lesson:** Students will complete the **Performance Task,** *Balls Colliding.* Prior to the activity, the teacher will ask students to remember what they learned about how the marbles moved after they collided with each other during an earlier investigation. The teacher will also ask students to recall how different-sized objects collided in a previous **Read-Aloud**. The teacher will help students make a prediction about what they expect to see during this investigation and have students explain their predictions based on previous observations. Students will complete the **Performance Task** and draw their observations in their notebooks. Students will discuss their observations with a partner and then answer the Essential Question for this lesson together with their classmates. Finally, students will complete the *When Objects Collide* lesson test.

Lesson 3: Direction and Force

Lesson 3: Day 1 and 2 - Direction and Force - Assess and Engage

- **Learning Intention:** I am learning about the phenomenon of a bat hitting a ball.
- **Success Criteria:** I can ask questions about the phenomenon and what I want to learn about it. I can discuss my explanations of the phenomenon by observing a video. I can choose a friend they think has the best idea about how to change the direction of motion of the train by completing the Page Keeley Science Probe. I can make observations about the phenomenon of a bat hitting a ball.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Changing Direction.* This is intended to serve as a pre-assessment and uncover students' basic ideas about direction and force and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a bat hitting a ball* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will also be introduced to the **Career Connection** of a *Statistician* and answer questions in their notebook.

Lesson 3: Day 3 - Direction and Force - Explore

- **Learning Intention:** I am learning that the change of force can change the way an object moves.
- **Success Criteria:** I can investigate how to change the way an object travels by completing an Inquiry Activity. I can observe and explain how to change the way that an object moves by completing an Inquiry Activity.
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity**, *Changing the Way an Object Goes*. Prior to starting the investigation, the teacher will help the students to make predictions about what they expect to happen. Students will draw arrows in their notebooks to demonstrate which direction they think that ball will travel. Students will carry out the investigation and draw their observations in their notebooks. Students will share their observations with the class and the teacher will lead a discussion by asking questions.

Lesson 3: Day 4, 5 and 6 - Direction and Force - Explain

- **Learning Intention:** I am learning that moving objects can change direction based on pushes and pulls.
- **Success Criteria:** I can explain how a moving object can change direction with a push or a pull. I can answer guided comprehension questions about the text.
- **Brief Overview of Lesson:** Students will be introduced to vocabulary that will help them to understand the lesson content. Teacher will read the vocabulary words aloud while students circle the words they have heard before in their notebooks. Students will complete the **Digital Interactive,** *Changing Directions* to learn how a moving object can change direction with a push or a pull. Students will answer questions based on their observation from the **Digital Interactive.** Students will complete a drawing activity in their notebooks to demonstrate how an object changes direction. Students will watch a short video about a marble changing directions as it moves through a maze, and they will answer questions and complete a drawing activity in their notebooks to illustrate how the marble changed directions throughout the maze. The teacher will reread a previous read-aloud text about pushes and pulls and students will answer questions using that text to explain how directions changed. Finally, students will revisit the **Page Keeley Science Probe** to change or justify their initial responses from the beginning of the lesson.

Lesson 3: Day 7 - Direction and Force - Elaborate

- **Learning Intention:** I am learning that moving objects can change direction based on pushes and pulls.
- **Success Criteria:** I can design and construct a maze and use that maze to observe how a marble moves and changes directions.
- **Brief Overview of Lesson:** Students will design and construct a maze to investigate how a marble moves and changes direction. Prior to beginning the **Inquiry Activity**, students will make a prediction about what they expect to observe. Students will draw arrows in their notebooks to show how a marble may move through and change direction. Before they begin building, students will draw the design of their marble maze in their notebooks. Students will use materials to make their own marble maze, testing it as they build to make sure that there is enough space for the marble to travel through the maze. Upon completion, students will draw arrows on their design plan to illustrate where the marble collided with the maze and changed direction. Students will share their observations with the class, and the teacher will lead a class discussion by asking questions about the investigation.

Lesson 3: Day 8 and 9 - Direction and Force - Evaluate

- **Learning Intention:** I am learning that moving objects can change direction based on pushes and pulls.
- **Success Criteria:** I can investigate how a pull can be used to change the direction of a basket by constructing a pulley device.
  I can design and construct a pulley device that can be used to change the direction of a basket.
- **Brief Overview of Lesson:** Students will construct a pulley device and investigate how a pull can be used to change the direction of a basket. Prior to beginning the Performance Task, students will make a prediction about what they expect to observe. The teacher will explain the directions and demonstrate how students should set up their pulley device. Working with a partner, students will use materials provided by the teacher to construct a pulley device and record their observations. Students will draw how they made the basket change directions using the pulley device. Teacher will lead a class discussion by asking students questions about the **Performance Task.** Students will revisit the lesson

phenomenon video and answer the essential question using vocabulary that they learned throughout the lesson. Finally students will take the *Direction and Force* lesson assessment.

Lesson 3: Day 10 - Module Performance Project

- **Learning Intention:** I am learning that push and pull can change an object direction.
- **Success Criteria:** I can apply my knowledge of forces and motion to design a way to move objects.
  I can design a way to move construction equipment up and over and around objects.
- **Brief Overview of Lesson:** Students will design a way to move the construction equipment up and over and around objects using what they have learned about forces and motion in the module.

CULTURALLY RESPONSIVE TEACHING in PRACTICE	SOCIAL EMOTIONAL LEARNING in PRACTICE
● Search for famous scientists in the field of "Forces and Motion" ● Search for current events related to motion, forces, pushes and pulls ● Try to find examples of a Construction Manager, Carpenter, Automotive Engineer, and Statistician from different cultures	● Responsible Decision-Making ○ Making ethical, constructive choices about personal and social behavior ● Relationship Skills ○ Forming positive relationships, working in teams, dealing effectively with conflict

Lesson 1:	**Pushes and Pulls**	**Estimated Time: 10 days (45 minutes per day)**

Brief Overview of Lesson:

- **Day 1:** Students will observe a photo of a toy train pulling freight cars over a hill and make initial explanations (*hopefully* explanations that will be supported throughout the lesson). Students will also be introduced to the **Career Connection** of a *Construction Manager* and answer questions in their notebook.
- **Day 2 and 3:** Students will complete the **Page Keeley Science Probe -** *Push or Pull?* This is intended to serve as a pre-assessment and uncover students' basic ideas about motion and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a hammer hitting a nail* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will also be introduced to the **Career Connection** of a *Carpenter* and answer questions in their notebook.
- **Day 4 and 5:** Students will listen to a read-aloud of the fiction selection *Queen of the Hill*. This story is about a colony of ants that must investigate how to move a large rock. Before reading, students will describe some ways they might have had to work together to move something large, such as a table or bench. Students will investigate the effect of a push and a pull on a heavy and a light bag of marbles. They will observe the difference each force has on objects of different weights. They will have the opportunity to change the strength of the push and the pull and observe the differences.
- **Days 6, 7 and 8:** Students will be introduced to vocabulary that will help them to understand the lesson content. Teacher will read the vocabulary words aloud while students circle the words they have heard before in their notebooks. Students will demonstrate understanding of a *push* and a *pull* by using their pencil/eraser to the actions. Teacher will perform a read-aloud called *Pushes and Pulls*, and students will learn how forces cause motion. Students will watch a short video and complete a **Digital Interactive** about pushes and pulls. The teacher will complete a read-aloud of a short **Science File** about pushing and pulling, and students will complete an activity in their notebook identifying examples of pushes

and pulls. Students will revisit the **Page Keeley Science Probe** to change or justify their initial responses from the beginning of the lesson. Finally, students will listen to a **Science Song** and describe to a partner what they have learned about pushes and pulls, using the song lyrics.

- **Day 9 and 10:** Students will apply different strengths of pushes and pulls to move a wagon. They will begin by making predictions about what they think will happen. The teacher will remind students that a prediction is a statement of what they expect to observe in the future. Students will explain their predictions based on previous observations and then complete the **Inquiry Activity**. Students will complete a **Performance Task** and record their data in their notebooks. Finally, students will complete a short assessment covering the content from the lesson.

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

- A force is a push or a pull. Either can move an object or put it into motion. Motion occurs when an object changes position relative to another object. When an object changes position, it has moved a distance. A push moves an object away from the push. A pull moves an object toward the pull. Some pulls are easy to see, such as pulling open a door, and others are more difficult, such as the pull it takes to pick up a grocery bag or backpack. Some objects are kept in motion with both a push and a pull. As a hammer bangs in a nail, it is being pushed down on the nail and then pulled back up to hit the nail again. To change motion, an object requires a push or a pull. A push or a pull can cause an object to start moving, change direction, or stop moving.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
PS2.A: Forces and Motion ● Pushes and pulls can have different strengths and directions. ● Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. **PS2.B:** Types of Interactions ● When objects touch or collide, they push on one another and can change motion.	● Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ● Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

Focus Question for this Lesson

How do pushes and pulls affect the way objects move?

Learning Intention	**Success Criteria**
I am learning the effects of pushes and pulls on an object.	*I can conduct an investigation and make observations to learn the effects of pushes and pulls on an object.*

Assessment(s)

- Page Keeley Science Probe - Push or Pull? (Lesson 1)
- Performance Task - A Moving Car (Lesson 1)
- Forces and Motion Lesson 1 Test

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

- Rubrics
- Student self-regulation or self-monitoring
- Peer Evaluation
- Lesson Trackers
- Aggressive Monitoring
- Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS
Anticipated Student Pre-Conceptions/Misconceptions
● Students may not know that movement is the result of either a push or a pull and that a push or a pull is necessary to make any change in motion. ● Students may have difficulty understanding that stopping an object from moving also involves a force, a push or a pull.
Integrated Accommodations & Modifications
English Language Learners/Socio Cultural Implications: ● Create a vocabulary anchor chart ● Create an anchor chart the class can utilize/reference throughout the module ● Use partnering strategy to allow students to work in teams. ● Provide students with pictures to cut and paste or use as a visual reference when answering questions ● Utilize scaffolding strategies ● Provide prompting and support ● 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. ● Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials ● Allow students to use Google Read&Write for speech to text to construct sentences independently. ● Display worksheet/textbook on SmartBoard **Special Needs:** ● Create a vocabulary anchor chart. ● Create an anchor chart the class can utilize/reference throughout the module. ● Use partnering strategy to allow students to work in teams. ● Provide students with pictures to cut and paste or use as a visual reference when answering questions ● Utilize scaffolding strategies ● Provide prompting and support ● 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 ● Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions. ● For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank. ● Provide students with tangible manipulatives to complete sorting tasks ● Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort ● 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) ● Provide students with a sheet of paper to only see one question at a time to reduce distraction ● Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials

- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

- 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.
- Plan for tiered learning

THE LESSON IN ACTION: Lesson 1, Day 1 - Module Opener

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

Lesson Opening

Module Opener

- Introduce the module phenomenon by showing the photo of a toy train pulling freight cars over a hill.
- **ASK**:
  - What did you see in the photo?
  - How do you think you can help the train change direction?
  - Do you wonder if the train is heavy?
- Use the questions below to elicit student responses.
- **ASK:**
  - What did you see in the photo? *(Sample answer: I saw a train pulling freight cars. It looked heavy.)*
  - How do you think the cars stay connected? *(Sample answer: The train cars stay connected with magnets.)*
  - How do you think you can make the train go faster? *(Sample answers: Pushing the train harder will make it go faster. Pushing it down a hill can help it go faster.)*

During the Lesson

- Read the science notebook to the students. Have students draw pictures of what they wonder about the train.
- **Introduce Key Vocabulary:**
  - Display the teacher presentation slide, and read the Key Vocabulary that students will learn in this module.
  - **Key Vocabulary:** collide, direction, distance, force, motion, position, pull, push and speed
  - These words are a selection of important vocabulary words that will be used throughout the module. Encourage students to listen for these Key Vocabulary words as they complete the module.

STEM Career Kid Connection: Construction Manager

- Display the teacher presentation slide to introduce Finn to students. Have them share their ideas about the work a construction manager does Share with students that Finn wants to be a construction manager when he grows up. Explain that a construction manager is in charge of a building site, where tools and equipment are used to complete projects. Construction managers need to know how to best use these tools. Finn is curious about how he can use tools to move things.

- Have students talk with a partner about ways Finn could move things on a train up and down hills and around lakes.
- Show students the video to introduce Career Kid Finn. Ask students what they learned about Finn.

Lesson Closing

Science and Engineering Practices:

- **I will** *plan an investigation*.
- **I will** *carry out an investigation*.
- Have students follow along as you read the "I will . . ." statements in your **science notebook**. The "I will . . ." statements for this lesson reference Science and Engineering Practices that will be covered throughout the lessons.
    - If this is the first time you are teaching these science and engineering practices, tell students that investigations should be planned in order to answer specific questions. During an investigation, they can gather data, and then interpret the data to see what it means.

THE LESSON IN ACTION: Lesson 1, Day 2 and 3 - Assess and Engage

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

Lesson Opening

Do Now:

- Ask students to describe what they already know about pushes and pulls.
- **ASK:**
    - What are some examples of a push and a pull?

During the Lesson

Assess Lesson Readiness - Page Keeley Science Probe - Push or Pull?

- This probe can be used as an elicitation prior to introducing a lesson on pushes and pulls.
    - 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 a wagon. Ask students to describe how they can move the wagon. Listen for them to use words like push and pull.
    - Introduce the probe by showing the picture of Paige and the wagon. Point to Paige and explain that Paige is moving the wagon up a hill.
    - **ASK:**
        - Is Paige pushing or pulling the wagon? Point to and read the answer choices.
    - Ask students to select the best answer to describe how Paige is moving the wagon.
    - 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.

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 hammer hitting a nail.***

- Play the video, and ask students what questions they have about it. Then read together in the science notebook. If students are having trouble generating their own questions, 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 hammer?
    - What did you wonder about what you saw in the video?
    - What interests you about the hammer?
- 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. Record the class questions in a location that you can reference later.

STEM Career Kid Connection: Carpenter

- Introduce Career Kid Chloe, who wants to be a carpenter when she grows up. A carpenter uses tools to make useful objects out of wood.
- **ASK**:
    - What is a carpenter? *(Sample answer: A carpenter is a person who builds things. Carpenters use tools to make objects out of wood.)*
    - Can you name things here in the school, in your home, or in your neighborhood that may have been made by a carpenter? *(Sample answer: A bench, a table, and my house are all made by a carpenter.)*
- Have students brainstorm different tools carpenters might use. Write their suggestions on the board.
- Show students the video. Ask students what they learned about Chloe.

Essential Question: How do pushes and pulls affect the way objects move?

- Have students follow along as you 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. Record students' answers, as well as their thoughts and questions about the Essential Question, on chart paper or the board so that you can reference them throughout the lesson. Then read aloud the instructions and have students complete the drawings in the science notebook.

Lesson Closing

Science and Engineering Practices:

- **I will** *plan an investigation*.
- **I will** *carry out an investigation.*
- Have students follow along as you read the "I will . . ." statements. Throughout the lesson, students will plan investigations to find out more about pushes and pulls. If this is the first time you are teaching the Science and Engineering Practices of planning and carrying out an investigation, explain that an investigation is a careful search for and examination of information in order to answer a question.
- **ASK**:

- How could you investigate the difference between a push and a pull? (*Sample answer: I could give different objects a push and then a pull and watch what happens.)*

THE LESSON IN ACTION: Lesson 1, Day 4 and 5 - Explore

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

Lesson Opening

Do Now:

- **ASK:**
  - How could you investigate the difference between a push and a pull?

During the Lesson

Queen of the Hill Read Aloud:

- Read aloud the fiction selection *Queen of the Hill* in the Science Paired Read Aloud. This story is about a colony of ants that must investigate how to move a large rock. Before reading, ask students to describe some ways they might have had to work together to move something large, such as a table or bench. As you read the story aloud, use the questions to guide student comprehension.
- **ASK**:
  - What do the ants do first? *(Sample answer: The ants try moving the rock with a magnet.)*
  - Why do you think the magnet doesn't work? *(Sample answers: The rock is not magnetic. The rock is not made out of iron (metal) and will not be attracted to the magnet.)*
  - How would you move the rock? *(Sample answer: I would push the rock.)*

Inquiry Activity- Push and Pull:

- Students will investigate the effect of a push and a pull on a heavy and a light bag of marbles. They will observe the difference each force has on objects of different weights. They will have the opportunity to change the strength of the push and the pull and observe the differences. With the bags of marbles hanging, students should notice that a similar push to each bag will move the lighter bag of marbles easier and farther than their push will move the heavy bag. Students will notice when they pull the two bags, the lighter bag will move easier with a pull than the heavier bag.

Advanced Preparation:

- Use the handkerchiefs as bags. Prepare the bags with marbles in advance to ensure one is obviously heavier than the other.

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. Read aloud the instructions and have students circle their predictions. Then have students explain their predictions based on previous observations.

Carry Out an Investigation:

- Read the directions aloud. Help students tie a small number of marbles into one handkerchief and a large number of marbles into a second handkerchief.
- Show students how to use a 6-foot length of string to tie the bags shut and to hang them from a table. If needed, help students tape the string to the table so the bags hang down, just a few inches up from the floor. Demonstrate how the bags should hang at a similar height.
- Next, have students give each bag a gentle push. Have them record what they observed.
- Have students increase the strength of their push. Ask them if they noticed anything different.
- Students should repeat this investigation using a gentle pull on each bag and then a stronger pull.

Record Data:

- Read aloud the instructions in the Science Notebook. Have students record their data to complete the page. Students should circle the picture of the bag that was easier to push. You could also have them underline the picture of the bag that was easier to pull.

Lesson Closing

Talk About It:

- Have students share their observations and data with their classmates.
- **ASK**:
- How did your data compare to the data of other students? *(Sample answer: Our data was similar. We noticed that the small bag was easier to push.)*
- What you should observe in this discussion is your students' ability to articulate the connection between the number of marbles in the bags and the force needed to move them. They should be able to determine which bag was easier to move with a push and a pull.
- **ASK**:
  - Why do you think the smaller bag was easier to push? *(Sample answer: There was less weight in it.)*
  - How did your pushes and pulls change? Why did they change? *(Sample answer: Some pushes and pulls were gentle, and some were strong and fast. They changed because the lighter bag was easier to move, and the heavier bag was harder to move.)*

THE LESSON IN ACTION: Lesson 1, Day 6, 7, and 8 - Explain

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

Lesson Opening

Do Now:

- **ASK:**
  - How could you make a push or a pull harder? How can you make a push or a pull easier?

During the Lesson

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 slides, display the words and their definitions. You may want to add the words to a word wall so students 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.
  - **motion**- a change in an object's position
  - **distance**- the amount of space between two places or things
  - **force**- a push or a pull that makes an object move
  - **position**- the place where something is located
  - **pull**- a force that moves something closer to you
  - **push**- a force that moves something away from you
  - **speed**- how fast or slow something moves

Develop Vocabulary

- **motion; position** To reinforce the terms motion and position, have students move different ways and stand in different locations. Then have other students describe their motion and position.

- **push; pull** Have students name different objects they must move during their day (for example, chair, toothbrush, and pencil), and have them give an example of how they move each object (for example, they pull their chairs out and push them back in, they push their toothbrush into their mouth and pull it back out, they pick up their pencil by pulling it up and then write by pushing it down).
- You may also want to have students use a fingertip to push an eraser slowly along their desk. This may help illustrate the meaning of a push. Have them then pinch the eraser between thumb and finger and pull it gently toward them. This will help reinforce the meaning of the word pull.
- **distance** Have students compare distances between classrooms, the cafeteria, and other locations in the school using terms such as longer and shorter.

Visual Kinesthetic Vocabulary:

- Have students cut out and fill in the Dinah Zike Visual Kinesthetic Vocabulary.

Pushes and Pulls Read Aloud:

- Read aloud *Pushes and Pulls* Science Paired Read Aloud.
    - Students will learn how forces cause motion. Before reading, have students list what they already know about how a force can make something move. They may be able to use some of the lesson vocabulary, such as push or pull, or they may be able to explain that a hard push can increase the speed of an object. The vocabulary words motion, position, speed and distance also appear in this selection. As you read aloud the selection, use the following questions to guide student comprehension.
- **ASK:**
    - What direction does an object move when it is pushed? *(Sample answer: An object moves away from the push.)*
    - What force will move an object closer toward you? *(Sample answer: a pull)*
    - What can you do to make an object move faster or go farther? *(Sample answer: You can increase the strength of the force of the push or the pull.)*
- After reading the selection, read aloud the instructions. Have students complete the drawing activity.

Push, Pull, Collide Video:

- Play the video Push, Pull, Collide and ask students to think about what they push and pull each day. Have them look at the pictures and see if they know if the picture is of a push or a pull. Students should indicate whether the picture shows a push or a pull by circling either the word push or pull. If students are having trouble with the words, display the words on the board, and give some examples of each type of force.

Pushes and Pulls Digital Interactive:

- Have students complete the Pushes and Pulls Digital Interactive to learn about the difference between a push and a pull.
- **ASK:**
    - What force moved the basketball? *(Sample answer: It was moved with a push.)*
    - What force moved the carrot out of the garden? *(Sample answer: It was pulled out of the garden.)*
    - How will the man need to change his push to move the car? *(Sample answer: He will have to push harder.)*
- Have students look at the pictures and decide which ones show a push and which show a pull. Have students circle the pictures that show a push. You could also have them underline the pictures that show a pull.

Pushing and Pulling Science File**:**

- Read aloud the Pushing and Pulling Science File to students to help them learn how a change in the strength of a force will change the speed and distance an object moves. While reading, students will encounter the vocabulary words push and pull.
- **ASK:**
    - How can the sled move more quickly? *(Sample answer: It can have a big pull.)*
    - How can the scooter be moved more slowly? *(Sample answer: It can be given a small push.)*

- Have students talk to a partner about what they learned. Have students look at the pictures and decide which shows a big push and which shows a small push. Have them complete the activity.

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 a cause makes something happen and an effect is what happens. Students should recognize cause and effect in the activities they have done in this lesson.
- **ASK**:
  - What causes the sled to move? *(Sample answer: a pull)*
  - What is the effect of giving the sled a harder pull? *(Sample answer: The effect is that the sled moves faster and goes farther.)*
  - What caused the scooter to move? *(Sample answer: a push)*
- Have students look at the picture of a child fishing.
  - Ask them to think about what happens to the fishing line when a fish is caught. What is the effect on the line when a fish is hooked?
  - Read aloud the words push and pull below the picture. Have students circle the word that tells what they think will be the effect.

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 that a force is a push or a pull, then have them revisit some activities in this lesson.
- **ASK:**
  - What causes an object to move? Sample answer: a push or a pull

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
- **ASK**:
  - Classify - What are some things that need a small push? *(Sample answer: Things that need a small push are toy cars, balls, and doorbells.)*
  - What are some things that need a big push? *(Sample answer: Things that need a big push are swings, grocery carts, and wheelchairs.)*
- Complete the graphic organizer as a class. If students were not able to identify objects that need a small push or a big push to move them, then have students attempt to push a box that contains one book and a box that is full of books. Ask students to describe how their pushes were different.

Reflect and Refine: Push or Pull?

- 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 pushes and pulls.
  - 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 an investigation.*
- **I can** *carry out an investigation.*
- Have the class say the "I can . . ." statements together. Then have students tell a partner what they can do. The "I can . . ." statements for this lesson references the Science and Engineering Practice of planning and carrying out investigations.

Using Science Songs:

- Print the lyrics of the song "Push and Pull".
- Pair up students, pass out the lyric page, and play the song "Push and Pull."

- Have students turn to their partner and share what the song is about.
    - You should hear the students explaining to each other what they have learned about pushes and pulls. Encourage students to underline words or phrases on the lyric page that help them understand the difference between a push and a pull.

Lesson Closing

ASK:

- What investigation did you plan to learn about pushes and pulls? *(Sample answer: I planned an investigation pushing and pulling different bags of marbles.)*
- How did you change the investigation, and what happened? *(Sample answer: I used a bigger push, and I saw the bags move farther.)*

THE LESSON IN ACTION: Lesson 1, Day 9 - Elaborate

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

Lesson Opening

Do Now:

- **ASK:**
    - What is an example that requires a big push? What is an example that requires a small push?

During the Lesson

Research, Investigate, and Communicate: Inquiry Activity - Push and Pull:

- Students will apply different strengths of pushes and pulls to move a wagon.

Make a Prediction:

- Remind students that a prediction is a statement of what they expect to observe in the future. Help students read the statements and circle their predictions. Then have students explain their predictions based on previous observations.

Carry Out an Investigation:

- Students will move the slide to set the distance the wagon will travel with either a push or a pull. The monkey will apply different strengths to make the wagon move.

Record Data:

- Students will record drawings of what they observed while exploring the Simulation.

Lesson Closing

Talk About It:

- In this activity, students investigated how the strength of a push or pull relates to how an object moves.
- **ASK**:
    - How did the monkey move the wagon? *(Sample answer: by pushing and pulling)*
    - What moves the wagon farther? *(Sample answer: bigger pushes and pulls)*
    - How did your results compare to your classmates' results? *(Sample answer: We noticed that the wagon moved more when the monkey pushed or pulled harder.)*

THE LESSON IN ACTION: Lesson 1, Day 10 - Elaborate

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

Lesson Opening

Do Now:

- **ASK:**
  - What did you notice about the force needed to move the wagon in the Digital Interactive from the last lesson?

During the Lesson

Performance Task- A Moving Car:

- Students will use what they have learned about pushes and pulls to move a toy car. Students will notice that pushing the toy car and pulling it will cause it to move in different ways.

Advanced Preparation:

- Fix the string to the cars in advance to ensure it is securely fastened.

Carry Out an Investigation:

- Read aloud the directions from the teacher presentation slide. Have students work together with a partner. They can take turns using different pushes to make the car move. Have them try different ways of stopping the car.
- Assist students in tying the string to the car if not already done. Then have partners take turns using different pulls to make the car move. Suggest they try short, hard pulls and gentler, continuous pulls. Have them try different ways of stopping the car.

Record Data:

- Have students record their data in their science notebook. Make sure students are recording data in the correct columns. Help students draw their information, if necessary.

Talk About It:

- Have students discuss how their car moved with a partner.
- **ASK**:
  - What made the car start to move? *(Sample answers: I pushed the car with my hand. I pulled the string to pull the car and make it move.)*
  - How did you stop the car? *(Sample answers: I had to pull back on the string to stop the car moving. I had to push my hand to the car to stop it.)*
- Have students look to connect the cause (a hard push or pull) with the effect (the distance the car moves). Have them use words from the lesson to describe what they observed as they moved the car in different ways.

Phenomenon:

- Revisit the lesson phenomenon of the video of the hammer. Play the video, and read aloud the class questions students generated at the beginning of the lesson. Discuss each question, and see if students can now answer them. Encourage them to use lesson vocabulary terms as they answer the questions.

Essential Question: How do pushes and pulls affect the way objects move?

- Have students refer to the answers you recorded to this question, and see if and how their thinking has changed. Read their original answers to students then discuss and share their current answers as a large group. Write a single sentence that captures students' thinking. Have students copy the class answer to the Essential Question in their science notebook. Help students who may struggle with the writing task.

Assessment:

- Have students complete the Lesson 1: Pushes and Pulls Assessment

Lesson Closing

Science and Engineering Practices:

- **I did** *plan an investigation.*
- **I did** *carry out an investigation.*
- Have students refer to the "I will . . ." and "I can . . ." statements.
- **ASK:**
  - Have you planned an investigation? If so, how? *(Sample answer: Yes, I planned how to move a car with a push and a pull.)*
- Read together as a class the "I did . . ." statements.

Lesson 1 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Lesson 2:	**When Objects Collide**	**Estimated Time: 7 days (45 minutes per day)**

Brief Overview of Lesson:

- **Day 1 and 2 - Assess and Engage:** Students will complete the **Page Keeley Science Probe** - *Toy Car Crash.* This is intended to serve as a pre-assessment and uncover students' basic ideas about objects colliding and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a soccer player* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will also be introduced to the **Career Connection** of an *Automotive Engineer* and answer questions in their notebook.
- **Day 3 - Explore:** Students will investigate what happens when different marbles collide by completing an **Inquiry Activity**, *Marbles Collide*. Students will make a prediction prior to the **Inquiry Activity**, *Marbles Collide*. The teacher will remind students that a prediction is a statement of what they expect to observe in the future. Students will also draw what they predict to happen. Students will roll two same-sized marbles into one another to observe what happens when they collide. They will notice their direction changes. Teacher will read aloud the directions and students will draw to record what they observed. Students will share their observations and data with their classmates and answer questions based on those observations.
- **Day 4 and 5 - Explain:** Students will be introduced to vocabulary that will help them to understand the lesson content. Teacher will read the vocabulary words aloud while students circle the words they have heard before in their notebooks. The teacher will perform a read-aloud called *When Things Collide*, and students will learn how size can affect the direction and speed of objects. Students will watch a short video and complete a **Digital Interactive** about things colliding. The teacher will assess student understanding by asking questions throughout. Students will revisit the **Page Keeley Science Probe** to change or justify their initial responses from the beginning of the lesson. Finally, students will listen to a **Science Song** and describe to a partner what they have learned about pushes and pulls, using the song lyrics.

- **Day 6 - Elaborate:** Students will complete an **Inquiry Activity,** *Bottle Bowling.* Prior to the investigation, students will make a prediction and share with their classmates. Students will complete the **Inquiry Activity** making observations throughout the investigation. During the activity, students will observe how changing the force of a push changes the effect of a collision. Students will identify how the force of their push changed the speed at which the bottles moved away from the ball. Students will draw their observations in their notebooks. The teacher will wrap-up this activity by asking students to answer a question based on the investigation and share their observations with a partner.
- **Day 7 - Evaluate:** Students will complete the **Performance Task,** *Balls Colliding.* Prior to the activity, the teacher will ask students to remember what they learned about how the marbles moved after they collided with each other during an earlier investigation. The teacher will also ask students to recall how different-sized objects collided in a previous **Read-Aloud**. The teacher will help students make a prediction about what they expect to see during this investigation and have students explain their predictions based on previous observations. Students will complete the **Performance Task** and draw their observations in their notebooks. Students will discuss their observations with a partner and then answer the Essential Question for this lesson together with their classmates. Finally, students will complete the *When Objects Collide* lesson test.

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

- Newton's First Law of Motion states: every object in a state of uniform motion tends to remain in that state of motion unless an external force is applied to it. A force is a push or pull. According to Newton's First Law, an object in motion will remain in motion until another force acts on it. Speeding up, slowing down, stopping, starting, and changing direction are all changes in motion. In the case of a ball pushed along the floor, the force of a pull (friction with the floor) slows the ball until it comes to rest. A collision with another object can also change its motion. When two marbles in motion collide, both will change direction, change speed, or even stop. The stronger the force of a push or pull, the greater the change in speed of the objects.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
PS2.A: Forces and Motion ● Pushes and pulls can have different strengths and directions. ● Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. **PS2.B:** Types of Interactions ● When objects touch or collide, they push on one another and can change motion.	● Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ● Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

Focus Question for this Lesson

What happens when objects touch or collide?

Learning Intention	**Success Criteria**
I am learning that objects change direction after colliding.	*I can conduct investigations and make observations to explain how objects change direction after a collision.*

Assessment(s)

- Page Keeley Science Probe - Toy Car Crash (Lesson 2)
- Performance Task - Balls Colliding (Lesson 2)
- Forces and Motion Lesson 2 Test

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

- Rubrics
- Student self-regulation or self-monitoring

- Peer Evaluation
- Lesson Trackers
- Aggressive Monitoring
- Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Students may think that the word collision always has a negative outcome, such as injury from a car collision or when they fall and their body hits the ground. Help students understand that in science a collision is any time two objects come together, such as hands hitting one another in a high five. That is a collision. Some collisions are beneficial and prevent accidents, such as a running shoe colliding with the ground to stop the runner or a cyclist pushing on the brakes to stop the bike from moving. Students may need more examples to help them understand collisions are any two objects hitting each other, which can have both benefits and detriments.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.

- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

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.
Plan for tiered learning

THE LESSON IN ACTION: Lesson 2, Day 1 and 2: Assess and Engage
Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.
Lesson Opening
Do Now: ● **ASK:** ○ What do you think happens when two objects touch or collide?
During the Lesson
Assess Lesson Readiness - Page Keeley Science Probe - Toy Car Crash ● Introduce the probe by showing the picture of the two toy cars, explaining that the toy cars are rolling across the floor toward each other. ○ Have students describe the direction each car is moving in. ○ Introduce the probe by telling the students that the toy cars are about to crash into each other. The two friends playing with the cars have different ideas about what will happen when the two cars collide. Point to each character, say the character's name, and read what they say to the students. Make sure students understand what each character is saying. ○ Ask the students to choose the friend they think has the best idea about what will happen when the cars collide. ○ 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. **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 soccer player. Play the video, and ask students what questions they have about the soccer ball and how it moves. If students are having trouble generating their own

questions, 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 how the ball moved?
  - What did you wonder about how the ball changed direction?
  - Have you seen other balls move like this before?
- 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 they generate right now. They will return to them later in the lesson. Record the class questions in a location that you can reference later.

STEM Career Kid Connection: Automotive Engineer

- Introduce Career Kid Riley, who wants to be an automotive engineer when she grows up. An automotive engineer investigates how cars move and then plans and designs cars that will move in different ways. **ASK:**
  - Why would an automotive engineer want to understand how objects move? *(Sample answer: Car engines are full of parts that move and bump into each other.)*
- Have students brainstorm different ways that familiar objects move when they are hit. Record the different things students identify on the board. Show students the video to introduce Career Kid Riley. Ask students what they learned about Riley.

Essential Question - What happens when objects touch or collide?

- Have students follow along as you read the Essential Question. Have them use prior knowledge and observations to try to answer the question and circle the correct picture.
  - Remind students 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.
  - Record students' answers, as well as their thoughts and questions about the Essential Question, on chart paper or the board so that you can reference them throughout the lesson.

Lesson Closing

Science and Engineering Practices: I will *carry out an investigation.*

- Have students follow along as you read aloud the "I will . . ." statement. Throughout the lesson, students will learn about colliding objects. They will conduct an investigation to demonstrate what happens when objects collide. If this is the first time you are teaching the Science and Engineering Practice of carrying out an investigation, explain that an investigation is a careful examination to get information to answer a question.
- **ASK**:
  - What is one reason you would conduct an investigation about colliding objects? *(Sample answer: to learn more about what happens when they bump into each other)*

THE LESSON IN ACTION: Lesson 2, Day 3: Explore

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

Lesson Opening

Do Now:

- **ASK:**
  - Why do you think that you are learning about objects colliding?

During the Lesson

Inquiry Activity - Marbles Collide:

- Students will investigate what happens when different marbles collide. Students will roll two same-sized marbles into one another to observe what happens when they collide. They will notice their direction changes. When two different-sized marbles are rolled into one another, the bigger marble has the ability to change the direction or motion of the smaller marble.

Advanced Preparation:

- Point out that students just saw a video about how a soccer player moves a ball. Now they will see what happens when two marbles bump into each other.

Make a Prediction:

- Remind students that a prediction is a statement of what they expect to observe in the future. Have students draw and record their predictions. Then have students explain their predictions based on previous observations.

Carry Out an Investigation:

- Read the steps of the investigation on the teacher presentation slide to students. Help students find a flat space on the floor.
  - Instruct them to sit on the floor across from a partner. Have them each choose a marble of the same size.
  - Demonstrate to students how they can roll the marbles into each other.
  - Have them investigate the changes in direction and speed as they roll the marbles.
  - Ask students to try rolling marbles of different sizes. Ask them to compare how the bigger marble moved after the collision to the way the smaller marble moved.

Record Data:

- Help students manage their data and record it in the correct columns in their science notebook. Help students draw their observations, if necessary.

Lesson Closing

Talk About It:

- Have students share their observations and data with their classmates.
- **ASK:**
  - What did you notice when the two small marbles bumped? *(Sample answer: The marbles knocked each other in different directions and changed their positions.)*
  - Did your classmates notice the same thing? *(Sample answer: My classmates noticed the marbles could be knocked in many different directions when they collided.)*
- What you should observe in this discussion is your students' ability to articulate the cause of the relationship between the force of the push and size of the marble and how those collisions can alter direction and speed.
- **ASK**:
  - What happened when you bumped the large marble into a smaller marble? (Sample answer: The large marble knocked the smaller marble in a different direction and the bigger marble slowed down. Both changed their position.)
  - Did a bigger force change the collision? (Sample answer: A bigger force on the marbles made them move farther when they changed direction.)

THE LESSON IN ACTION: Lesson 2, Day 4 and 5: Explain

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

Lesson Opening

Do Now:

- **ASK:**
  - Does a bigger force change the impact when two objects collide? Think back to the Inquiry Activity in the last lesson to help you answer the question.

During the Lesson

Obtain and Communicate Information: Vocabulary:

- Have students read the vocabulary words listed aloud. Have students circle vocabulary words that they have heard before. Using the teacher presentation slides, display the words and their definitions. You may want to add the words to a word wall so students 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.
  - **collide -** to hit something with strong force

When Things Collide Read Aloud:

- Read the nonfiction selection *When Things Collide* in the Science Paired Read Aloud. The vocabulary word collide appears in this selection. As you read aloud the selection, use the questions to guide student comprehension.
- **ASK:**
  - Why do you think the floor stopped the book's motion? *(Sample answer: The floor is stronger than the book and stops the book from moving.)*
  - Why does the bowling ball knock over the pins? *(Sample answer: The ball is thrown with a strong push, so when it collides with the pins it can knock them over.)*
  - Explain how a bat moves a ball far away. *(Sample answer: A bat swings with a greater force than the ball is thrown. The bat pushes the ball with a strong force and moves it far away.)*
- Have students draw some of the things they learned about in their science notebook.

Develop Vocabulary:

- **collide** To reinforce the concept of collisions, have students name things they have seen bump into each other (a door and its frame, a ball and a bat, or hands clapping), and have them use the vocabulary word to describe the actions (for example, pushing hands together makes them collide).

When Objects Collide Video:

- Ask students what changes they noticed when they observed two objects colliding. Have students watch the video *When Objects Collide*. It shows how size can affect the direction and speed of objects.
- **ASK**:
  - Why does the counter stop the egg from moving any farther? *(Sample answer: The counter is much bigger, and the moving egg does not have enough force to move the counter. The egg is stopped by the bigger counter.)*
  - What would change how far the ball travels after colliding with the bat? *(Sample answer: Using more force to hit the ball with the bat would make the ball go farther.)*
- In their science notebook, have students draw the effect the collision will have on the tower of blocks. Then help them copy the word to finish the sentence.

Objects Colliding Digital Interactive:

- Have students explore the *Objects Colliding* Digital Interactive. Explain to students that you will show them pictures of objects colliding. Ask students to identify the objects that are colliding with each other in each picture.
- **ASK:**
  - What collides to make a clapping sound? *(Sample answer: hands)*
  - What two things collide in the soccer picture? *(Sample answer: the player's head and the ball)*
  - What collides in a Newton's cradle? *(Sample answer: The outside balls collide and then push the next ball in line.)*

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 of the effects of collisions, then have them revisit some activities in this lesson.
- **ASK:**
  - What do you think would happen if a large object gently collided with a smaller object? *(Sample answer: The smaller object would move in a different direction, but not as far as if the larger object had hit it hard. The smaller object would change its position.)*
- **ASK**:
  - What happens when objects collide? *(Sample answer: The objects move in different directions. A bigger object may move a smaller object farther.)*
- Read aloud the instructions on page 20 of the **Science Notebook**. Have students complete the graphic organizer.
  - Ask them to draw what they think the effect will be of the objects colliding. Then have them talk about their drawings with a partner. (Sample answer: The bowling ball will move the pins and the foot will push the ball away. The pins and/or ball's position will change.)

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
- **ASK:**
  - What is the effect when objects collide? *(Sample answer: The objects change direction. They can change their speed, stop moving, and/or change position.)*

Reflect and Refine -Toy Car Crash:

- 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 a collision can change the direction an object is moving. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

Lesson Closing

Science and Engineering Practices: **I can** *carry out an investigation*.

- Read aloud the text.
- Have the class say the "I can . . ." statement together. Then have students tell a partner what they can do. The "I can . . ." statement for this lesson references the Science and Engineering Practice of planning and carrying out investigations.
- **ASK:**
  - What did you do to investigate how objects move after a collision? *(Sample answer: I moved marbles into each other and observed what happened.)*
  - What did you change in the investigation, and what happened when you made this change? *(Sample answer: I changed the size of the marbles. The bigger marble moved the smaller marble farther than the smaller marble moved the bigger marble.)*

THE LESSON IN ACTION: Lesson 2, Day 6: Elaborate

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

Lesson Opening

Do Now:

- **ASK:**
  - What happens when two objects collide?

During the Lesson

Research, Investigate, and Communicate: Inquiry Activity - Bottle Bowling

- Students will observe how changing the force of a push changes the effect of a collision. They will notice the change in speed and direction of the bottles' movement. Students will identify how the force of their push changed the speed at which the bottles moved away from the ball.

Make a Prediction:

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

Carry Out an Investigation:

- Read aloud the activity directions from the teacher presentation slide. Students may need to practice pushing the ball toward the bottles to make sure they can move it in the desired direction.
  - Have students give the ball a small push toward the bottles and observe the effect. Then have students record their data.
  - Have students return the bottles to their starting position and then give the ball a harder push. Have students observe the effect of the hard push and record their data.

Record Data:

- Make sure students are recording data in their science notebook. Ensure that their drawings include all of the important information, particularly the distance the bottles move and how many are moved. Have students look for a pattern in how the bottles moved in relation to the force of the ball.

Lesson Closing

Talk About It:

- Have students discuss what they observed as they changed the force with which they pushed the ball.
- **ASK**:
  - What did you notice about the number of bottles that moved with each roll? *(Sample answer: More bottles fell down if I pushed the ball harder.)*
  - Why do you think more bottles fell down when you pushed the ball harder? *(Sample answer: The ball moved with more force and pushed the bottles it collided with farther. The bottles knocked each other over.)*

THE LESSON IN ACTION: Lesson 2, Day 7: Evaluate

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

Lesson Opening

Do Now:

- **ASK:**
  - Think back to the last activity we did. Why did more bottles fall down when you pushed the ball harder?

During the Lesson

Performance Task- Balls Colliding

- Students will investigate how balls of different sizes move after they collide. The bigger balls will move farther when they collide with each other and the smaller balls.

Advanced Preparation:

- Prior to the activity, ask students to remember what they learned about how the marbles moved after they collided with each other during their earlier investigation. Have them recall how different-sized objects collided in the Science Paired Read Aloud selection.

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

Carry Out an Investigation:

- Read aloud to students the steps of the investigation.
  - Pair students. Allow students to each choose one ball.
  - Have them roll the balls into one another and observe what happens.
  - **Record Data:** Have them record their observations in their science notebook.
  - Have students each choose a different ball and repeat their investigation. Provides students with guidance as needed.
- Allow time for the class to compare their drawings and explain what happened during their investigation with their classmates.

Talk About It:

- In this activity, students choose their own materials to test and observe the effects of a collision between different types of balls.
- **ASK**:
  - What did the two balls do? *(Sample answer: The bigger ball slowed the smaller ball down. The lighter ball moved away from the heavier ball faster.)*
  - Did some balls move in a different way? *(Sample answer: Heavier balls moved away from each other more slowly. Lighter balls moved away from heavier balls more quickly.)*
  - How did your results compare to your classmates' results? *(Sample answer: Some of my classmates had different results because they picked different balls to test.)*
  - How did this activity help you learn more about how different objects move after a collision? *(Sample answer: This helped me see several different ways balls could collide and move after a collision. It was interesting to see how different sizes and different weights affected the balls' speed and change in position.)*

Phenomenon:

- Revisit the lesson phenomenon of the video of the soccer player.
- Play the video, and read aloud the class questions students generated at the beginning of the lesson. Discuss each question, and see if students can now answer them. Encourage them to use lesson vocabulary terms as they answer the questions.

Essential Question- What happens when objects touch or collide?

- Refer to the answers you recorded to this question at the beginning of the lesson, and see if and how students' thinking has changed.
- Discuss and share their answers as a large group.

- Write a single sentence that captures students' thinking. Have students copy the sentence in their science notebook. Help students who may struggle with the writing task.

Assessment:

- Students will complete the Lesson 2: When Objects Collide assessment.

Lesson Closing

Science and Engineering Practices: I did *carry out an investigation.*

- Refer to the "I will . . ." and "I can . . ." statements in their science notebook.
- **ASK:**
  - Have you carried out an investigation? If so, how? *(Sample answer: Yes, I investigated how pushing a ball different ways affected the bottles it bumped into.)*
- Read together as a class the "I did . . ." statement.

Lesson 2 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Lesson 3:	**Direction and Force**	**Estimated Time: 10 days (45 minutes per day)**

Brief Overview of Lesson:

- **Day 1 and 2 - Assess and Engage:** Students will complete the **Page Keeley Science Probe -** *Changing Direction.* This is intended to serve as a pre-assessment and uncover students' basic ideas about direction and force and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a bat hitting a ball* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will also be introduced to the **Career Connection** of a *Statistician* and answer questions in their notebook.
- **Day 3 - Explore:** Students will complete the **Inquiry Activity**, *Changing the Way an Object Goes*. Prior to starting the investigation, the teacher will help the students to make predictions about what they expect to happen. Students will draw arrows in their notebooks to demonstrate which direction they think that ball will travel. Students will carry out the investigation and draw their observations in their notebooks. Students will share their observations with the class and the teacher will lead a discussion by asking questions.
- **Day 4, 5, and 6 - Explain:** Students will be introduced to vocabulary that will help them to understand the lesson content. Teacher will read the vocabulary words aloud while students circle the words they have heard before in their notebooks. Students will complete the **Digital**

Interactive, *Changing Directions* to learn how a moving object can change direction with a push or a pull. Students will answer questions based on their observation from the **Digital Interactive.** Students will complete a drawing activity in their notebooks to demonstrate how an object changes direction. Students will watch a short video about a marble changing directions as it moves through a maze, and they will answer questions and complete a drawing activity in their notebooks to illustrate how the marble changed directions throughout the maze. The teacher will reread a previous read-aloud text about pushes and pulls and students will answer questions using that text to explain how directions changed. Finally, students will revisit the **Page Keeley Science Probe** to change or justify their initial responses from the beginning of the lesson.

- **Day 7 - Elaborate:** Students will design and construct a maze to investigate how a marble moves and changes direction. Prior to beginning the **Inquiry Activity**, students will make a prediction about what they expect to observe. Students will draw arrows in their notebooks to show how a marble may move through and change direction. Before they begin building, students will draw the design of their marble maze in their notebooks. Students will use materials to make their own marble maze, testing it as they build to make sure that there is enough space for the marble to travel through the maze. Upon completion, students will draw arrows on their design plan to illustrate where the marble collided with the maze and changed direction. Students will share their observations with the class, and the teacher will lead a class discussion by asking questions about the investigation.
- **Day 8 and 9 - Evaluate:** Students will construct a pulley device and investigate how a pull can be used to change the direction of a basket. Prior to beginning the Performance Task, students will make a prediction about what they expect to observe. The teacher will explain the directions and demonstrate how students should set up their pulley device. Working with a partner, students will use materials provided by the teacher to construct a pulley device and record their observations. Students will draw how they made the basket change directions using the pulley device. Teacher will lead a class discussion by asking students questions about the **Performance Task.** Students will revisit the lesson phenomenon video and answer the essential question using vocabulary that they learned throughout the lesson. Finally, students will take the *Direction and Force* lesson assessment.
- **Day 10 - Module Performance Project:** Students will design a way to move the construction equipment up and over and around objects using what they have learned about forces and motion in the module.

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

- Energy is transferred when a force makes things work or change. A push or a pull is a force, and either can result in an object changing its position. When objects move, Newton's First Law of Motion states that they will continue in that motion until another force is applied. In the case of collisions, that force can come from another object. When two objects touch one another, that touch, or collision, can change the direction of the objects, slow them down, or stop them. A collision is a push that has the ability to change motion. The change in motion can change the direction the object was traveling. Students should be familiar with examples of this, since they may be involved in sports or games using balls. Kicking a ball pushes that ball to travel in a new direction. A hockey stick pushing a puck in a new direction is another example.

LESSON FOUNDATION

Assessed Standards for this lesson	Important content not included in the standards
PS2.A: Forces and Motion • Pushes and pulls can have different strengths and directions. • Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. **PS2.B:** Types of Interactions • When objects touch or collide, they push on one another and can change motion.	• Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. • Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

Focus Question for this Lesson

What happens when objects touch or collide?	
Learning Intention	**Success Criteria**
I am learning to describe and explain how objects change direction with a push or pull.	*I can investigate how objects can change direction with a push or a pull.*
Assessment(s)	
● Page Keeley Science Probe - Changing Direction (Lesson 3) ● Performance Task - Using a Pulley (Lesson 3) ● Forces and Motion Lesson 3 Test ● Forces and Motion Module Performance Project - Design a Solution ○ Forces and Motion Module Performance Project - Design a Solution Rubric	
Feedback (Peer to peer/student to teacher/teacher to student)	
● Rubrics ● Student self-regulation or self-monitoring ● Peer Evaluation ● Lesson Trackers ● Aggressive Monitoring ● Daily Checks for Understanding	

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS
Anticipated Student Pre-Conceptions/Misconceptions
● Students may think objects change direction on their own, particularly when they think of themselves running. In this lesson, help them understand that every movement is the result of a force on the object. To illustrate the idea that a change in direction needs a force, you may demonstrate with a grocery cart. A grocery cart only changes direction when the person pushing the cart decides to steer the cart in the new direction. Students may also consider the example of a bicycle. A bicycle only changes direction when someone moves the handlebars.
Integrated Accommodations & Modifications
English Language Learners/Sociocultural Implications: ● Create a vocabulary anchor chart ● Create an anchor chart the class can utilize/reference throughout the module ● Use partnering strategy to allow students to work in teams. ● Provide students with pictures to cut and paste or use as a visual reference when answering questions ● Utilize scaffolding strategies ● Provide prompting and support ● 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. ● Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials ● Allow students to use Google Read&Write for speech to text to construct sentences independently. ● Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

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.
Plan for tiered learning

THE LESSON IN ACTION: Lesson 3, Day 1 and 2: Assess and Engage
Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.
Lesson Opening
Do Now: ● **ASK:** ○ How do you think you can make an object change direction?
During the Lesson
Assess Lesson Readiness- Page Keeley Science Probe - Changing Direction ● Introduce the probe by showing the picture of three friends playing with a toy train.

- Explain that the train is moving in a straight line. Have students trace with their hands how the train is moving forward in a straight line. The three friends playing with the train have different ideas about how they can change the direction in which the train is moving.
    - Point to each character, say the character's name, and read what the character is saying to the students. Make sure students understand what each character is saying.
- Then ask the students to choose the friend they think has the best idea about how to change the direction of motion of the train. Make sure they focus on the characters' ideas and not the characters' looks, name, or other features they like the most. Choose a talk configuration (pair, small group, whole class, or combination) and listen carefully as students share their thoughts. Use talk moves to help them explain their thinking.

Science in My World - Phenomenon:

- Play the video, and ask students what questions they have about it. If students are having trouble generating their own questions, 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 made the baseball change the direction it was moving?
    - What did you wonder about when you saw the video?
    - How does this relate to you?
    - Have you seen something like this before?
- 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. Record the class questions in a location that you can reference later.

STEM Career Kid Connection: Statistician

- Introduce Career Kid CJ, who wants to be a statistician when he grows up. A statistician is interested in collecting data and analyzing it to answer questions.
- **ASK:**
    - How can you change the direction an object moves? *(Sample answer: You can give a push or a pull to an object to make it change direction. A push will move it away from you, and a pull will move it toward you.)*
- Why would a statistician be interested in how objects change direction? *(Sample answer: A statistician would be interested in measuring how much an object changes direction or the object's speed. The measurements could be analyzed to improve a design.)*
- Have students brainstorm different ways to make a moving object change its direction. Write their suggestions on the board. Show students the video. Ask students what they learned about CJ.

Essential Question - How can pushes and pulls change an object's direction?

- Have students follow along as you 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. Record students' answers, as well as their thoughts and questions about the Essential Question, on chart paper or the board so that you can reference them throughout the lesson.
- Have students draw their ideas about how a push and a pull can change an object's direction in their science notebook.

Lesson Closing

Science and Engineering Practices: I will *analyze data*.

- Have students follow along as you read the "I will . . ." statement. Throughout the lesson, students will learn about how a push or a pull can change the direction of an object. They will record data and analyze it as they investigate how an object changes direction. If this is the first time you are teaching the Science and Engineering Practice of analyzing data, tell students that analyzing means looking for patterns in data.

- **ASK**:
  - What kind of pattern might you see if you measured the speed of a race car? Sample answer: The car might get faster and faster in the race and then get slower and slower after the race was finished.

THE LESSON IN ACTION: Lesson 3, Day 3: Explore

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

Lesson Opening

Do Now:

- **ASK:**
  - How can pushes and pulls change an object's direction?

During the Lesson

Inquiry Activity- Changing the Way an Object Goes:

- Students will investigate how to change the way an object travels. They will observe how a ball changes direction and will record data. Students should see how the direction of the ball can be changed by several different ways, including a push from a hand, a collision from the floor, and a pull on the ball.

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 record their predictions in their science notebook. Make sure that they are able to draw an arrow on the pictures to show the direction the object will move. Have students explain their predictions based on previous observations.

Carry Out an Investigation:

- Read the steps of the investigation to students from the teacher presentation slide.
  - Explain to students that they will investigate the different ways they can change the direction of a moving ball. Have students work with a partner.
  - First, they should try pushing the ball to each other. They should watch how it travels in one direction or the other. Then have students try to change the direction the ball is going by pushing it with their hand while it is moving. Have them try to change its direction by pulling on it as it rolls. Next, encourage students to bounce the ball to their partner, using the floor to change the direction the ball goes. Have students move the ball in other ways, such as throwing it up in the air and catching it, moving it back and forth between their two hands, or catching a ball that their partner throws.
  - Make sure to tell students that when they catch a ball and move it toward themselves, they are pulling the ball. To help students make accurate observations, record their actions with a tablet or phone, and play the video back in slow motion, identifying the pushes and pulls that are used to change the direction.

Record Data:

- Read aloud the instructions. Make sure students record four different ways they changed the direction of the moving ball. Have them identify the direction the ball moved by adding arrows to their drawings in their notebook. Help students draw their answers, if necessary.

Talk About It:

- Have students share their observations and data with their classmates.
- **ASK:**

- How do your observations compare to the observations of your classmates? *(Sample answer: Our pictures show similar ways that the ball changed direction.)*
- What did you do to cause the ball to change directions? *(Sample answer: I changed the direction the ball was travelling by pushing and pulling it.)*

- What you should observe in this discussion is your students' ability to articulate the relationship between how they moved the ball with a push and how they moved the ball with a pull to change the direction the ball moved.

Lesson Closing

- **ASK:**
  - What happened when you pulled on the ball while it was rolling? *(Sample answer: The ball slowed down and moved in the direction I pulled.)*
  - How did the floor help change the direction the ball bounced? *(Sample answer: When I pushed the ball into the floor, the floor didn't move, and the ball bounced.)*

THE LESSON IN ACTION: Lesson 3, Day 4, 5, and 6: Explain

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

Lesson Opening

Do Now:

- **ASK:**
  - Think back to the activity from the last lesson. What did you do to cause the ball to change direction?

During the Lesson

Obtain and Communicate Information: Vocabulary:

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 may want to add the word to a word wall so that students 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.

- **direction -** the course or path on which something moves

Develop Vocabulary:

- **direction** Have students brainstorm words that are used to describe direction, such as away, toward, north, south, straight ahead, and so on. Demonstrate the meaning of these direction words as you move around the room.

Change Directions Digital Interactive:

- Have students complete the Change Directions Digital Interactive, to learn how a moving object can change direction with a push or a pull.
- **ASK**:
  - How does a toy car change direction? *(Sample answer: The toy car is pushed away from you.)*
  - How does a door change direction? *(Sample answer: A door is pulled to open it and pushed to close it.)*
- Read aloud the instructions and have students complete the drawing activity.

Marble Maze Video:

- Tell students they will watch a marble travel through a maze. Ask them to watch how the marble changes the direction it travels in the maze. Play the video for students.
- **ASK**:

- What made the marble change direction? *(Sample answer: The marble changed direction when it was pushed or when it bumped into a wall and pushed off.)*
- How did the straws help change the direction the marble traveled? *(Sample answer: The straws gave the marble a place to bump into and change direction.)*

- Read aloud the instructions and have students complete the drawing of what they saw in the video.

Pushes and Pulls Read Aloud:

- Reread the nonfiction selection *Pushes and Pulls* in the Science Paired Read Aloud. As you read aloud the selection, use the following questions to guide student comprehension.
- **ASK:**
  - Look at the boy pulling the wagon. How does he change the direction the wagon goes? *(Sample answer: As he pulls the wagon toward himself and when he turns, the wagon changes direction too.)*
  - Look at the woman pushing the wheelchair. How do you think she can change its direction? *(Sample answer: The woman will push the wheelchair, and it will move in a direction away from her.)*

- Have students talk with a partner about what they learned. Remind them to use the word direction in their discussion.

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 a cause makes something happen and an effect is what happens. Students should recognize cause and effect in the activities they have done in this lesson.
- **ASK**:
- What causes an object to change direction? *(Sample answer: An added force of a push or a pull will cause an object to change direction.)*

Talk About It:

- Use the Talk About It question to assess students' understanding of what they have learned so far. Have students talk about what they learned in the Paired Read Aloud using the new vocabulary word. Have students share what they learned with their classmates. If students do not demonstrate understanding about how a moving object can have its direction changed by a collision, have them revisit some activities in this lesson.
- **ASK:**
  - What happens when two objects collide? *(Sample answer: When two objects touch, they move each other back with the force of the push. This push moves the objects and changes their direction.)*

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
- **ASK:**
  - What two objects can change direction with a push? *(Sample answer: ball, bicycle, grocery cart)*
  - What two objects can change direction with a pull? *(Sample answer: zipper, wagon, door Complete the graphic organizer as a class.)*
- If students were not able to make the connection between how a push or a pull can change the direction of an object, have them review their data from the Changing the Way an Object Goes activity.

Reflect and Refine -Changing Direction

- 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 pushes and pulls. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding

Lesson Closing

Science and Engineering Practices: I can *analyze data.*

- Have the class say the "I can . . ." statement together. Then have students tell a partner what they can do. The "I can . . ." statement for this lesson references the Science and Engineering Practice of analyzing data.
- **ASK:**
  - How did you analyze data to answer a question? *(Sample answer: I analyzed data about how different pushes and pulls changed the direction of the ball. I learned that larger pushes move the ball more.)*

THE LESSON IN ACTION: Lesson 3, Day 7: Elaborate

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

Lesson Opening

Do Now:

- **ASK:**
  - What is one example of an object that can change direction with a pull and an example of an object that can change direction with a pull.

During the Lesson

Research, Investigate, and Communicate: Inquiry Activity- Make a Marble Maze

- Students will design and construct a maze to investigate how a marble moves and changes direction. Students may need you to demonstrate how to cut the straws and tape them in the maze. Students may have to push the marble in the maze. The marble may collide with the maze to change direction.

Advanced Preparation:

- You may wish to prepare by cutting the straws in advance. Make a Prediction Have students draw arrows in the maze on in their science notebook to predict how a marble may move through and change direction.

Carry Out an Investigation:

- Read aloud the directions from the teacher presentation slide. Help students design their maze. Make sure they draw the plan for their maze in the space provided in their science notebook.
- Have students tape the cut straws onto their shoebox lid. Demonstrate how to tape rows of straws to make a path for the marble and how to place straws to make a corner in the maze. As students construct their mazes, have them use a marble to test the width of their paths and ensure that there is enough space for the marble to travel.
- Have students move a marble through their maze and observe how the marble collides with the walls as it moves through the maze. Have students repeat the activity several times.

Record Data:

- Have students use their drawing in their science notebook to record the path the marble took. Guide students in adding arrows to their drawing to show the marble's path. Point out that the arrows show where the marble collided with the maze and changed direction.

Lesson Closing

Talk About It:

- Have students discuss how their marble moved and changed direction in the maze.
- **ASK:**
  - What did the marble collide with in the maze, and what happened? *(Sample answer: My marble collided with straws and the edge of the box, and when it did, it changed direction.)*
  - How did your marble's movement through the maze compare with the movement of your classmates' marbles? *(Sample answer: My marble needed to be pushed to keep it moving when it bumped in some places. Some classmates' marbles changed direction with less pushing.)*

THE LESSON IN ACTION: Lesson 3, Day 8 and 9: Evaluate

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

Lesson Opening

Do Now:

- **ASK:**
  - In the previous lesson, what did your marble collide with in the maze and what happened?

During the Lesson

Performance Task- Using a Pulley

- Students will construct a pulley device and investigate how a pull can be used to change the direction of a basket. Pulling the rope will result in the basket moving in the opposite direction.

Advanced Preparation:

- Prior to the activity, ask students to remember what they learned about how a push or a pull can cause an object to change direction.

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

Carry Out an Investigation:

- Read the steps of the investigation together with students.
  - Pair students. You may need to demonstrate how to string the rope through the backs of the chairs and tie it. Allow students time to build the pulley system and check that it functions.
  - Ask students to move the basket in one direction. Ask them to think about how they are moving the basket.
  - Record Data Have them record this movement in their science notebook. Circulate around the room, and provide assistance with the pulley systems and help students with their drawings to record the important aspects, if necessary.
  - Now have students change the direction the basket moves.
  - Ask them to record how they changed the direction of the basket in their science notebook.

Talk About It:

- In this activity, students explored how a pulley system changes the direction of a basket.
- **ASK**:
  - How did your pulley system compare to your classmates' systems? *(Sample answer: My pulley system worked the same as my classmates' did.)*
  - What were the results of your investigation? (*Sample answer: The basket moved when I pulled one rope. When I pulled on the other rope, the pulley changed direction.)*
  - What did this activity help you learn about how objects change direction? *(Sample answer: It was easy to see how a pull changes an object's direction.)*

Phenomenon:

- Revisit the lesson phenomenon video. Play the video, and read aloud the questions students generated at the beginning of the lesson. Discuss each question, and encourage students to use the lesson vocabulary term as they answer the questions.

Essential Question- How can pushes and pulls change an object's direction?

- Have students refer to the answers you recorded and see if and how their thinking has changed. Discuss and share their answers as a large group. Write a single sentence that captures students' thinking. Have students copy the sentence in their science notebook. Help students who may struggle with the writing task.

Assessment

- Students will complete the **Lesson 3: Direction and Force** assessment

Lesson Closing

Science and Engineering Practices: I did *analyze data*.

- Have students refer to the "I will . . ." and "I can . . ." statements.
- **ASK**:
  - Have you analyzed data? If so, how? (Sample answer: Yes, I analyzed how pushes and pulls can change motion.)
- Read together as a class the "I did . . ." statement.

THE LESSON IN ACTION: Lesson 3, Day 10: Module Performance Project
Lessons are designed to be able to transfer from IN-PERSON to HYBRID to VIRTUAL learning.
Lesson Opening
Do Now: ● **ASK:** ○ How does a pulley help change an object's direction?
During the Lesson
Performance Project: Design a Solution ● Students will design a way to move the construction equipment up and over and around objects using what they have learned about forces and motion in the module.
Lesson Closing
Wrap-Up:

- Teachers will ask students to provide examples of how an object's direction can change based on different forces.

Lesson 3 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Module 2:
Energy and the Sun

Stage 1 – Desired Results

ASSESSED FOCUS STANDARDS:
PS3.B: Conservation of Energy and Energy Transfer

- Sunlight warms Earth's surface. (K-PS3-1),(K-PS3-2)

CONTENT CONNECTIONS:

ELA/Literacy

- W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).

Mathematics

- K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.

Unit Description

Anchoring Phenomenon: A sunny playground
Statement: The sun affects Earth's surface.
Observation/Demonstration/Experience: Observe the photo of a sunny playground.

Driving Question:
How does the Sun affect Earth's surface?

Meaning

ENDURING UNDERSTANDINGS:

- The Sun is a star, just like the ones you see in the sky at night.
- The Sun rises in the east, appears to move across the sky, and it sets in the west.
- The Sun is the primary source of energy for Earth.
- Energy from the Sun reaches Earth and warms its surface and things on its surface.
- The Sun also affects Earth's seasons.

ESSENTIAL QUESTIONS:

- How does the Sun affect Earth's surface?
- How can we stay cool in the Sun?

	● Blocking the Sun's energy lowers the temperature underneath.	
	What students will know and be able to do	
	KNOWLEDGE: ● Students will conduct investigations and make observations to explain the effect of sunlight on Earth's surface. (Lesson 1) ● Students will design a structure that will reduce the warming effect of sunlight on an area. (Lesson 2)	**SKILLS:** ● **K-PS3-1:** Make observations to determine the effect of sunlight on Earth's surface. ○ [Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water] ○ Make observations (firsthand or from media) to collect data that can be used to make comparisons. ○ Events have causes that generate observable patterns. ● **K-PS3-2:** Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area. ● [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.] ● Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. ● Events have causes that generate observable patterns.

Stage 2 – Evidence

SUMMATIVE ASSESSMENT(S)

- Performance Task - Give a News Report (Lesson 1)
- Energy and the Sun Lesson 1 Test
- Performance Task - Draw an Animal Shelter (Lesson 2)
- Energy and the Sun Lesson 2 Test
- Energy and the Sun Module Performance Project - Design a Structure to Make Shade
  - Energy and the Sun Module Performance Project Rubric - Design a Structure to Make Shade
- Energy and the Sun Module Test
- STEM Gauge #464535

PRE-ASSESSMENT

- Page Keeley Science Probe - Warm Sun (Lesson 1)

- Page Keeley Science Probe - Sunlight and Shade (Lesson 2)

Integration of 21st Century Skills	Integration of Technology	Career Education

• **9.1.4.A.1:** Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.
• **9.1.4.A.2:** Evaluate available resources that can assist in solving problems.
• **9.1.4.A.3:** Determine when the use of technology is appropriate to solve problems.
• **9.1.4.A.4:** Use data accessed on the Web to inform solutions to problems and the decision-making process.
• **9.1.4.A.5:** Apply critical thinking
• **9.1.4.B.1:** Participate in brainstorming sessions to seek information, ideas, and strategies that foster creative thinking.
• **9.1.4.D.1:** Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
• **9.1.4.E.2:** Demonstrate effective communication using digital media during classroom activities.
• **9.3.4.A.2:** Identify various life roles and civic and work-related activities in the school, home, and community.
• **9.3.4.A.3:** Appraise personal likes and dislikes and identify careers that might be suited to personal likes.
• **9.3.4.A.4:** Identify qualifications needed to pursue traditional and nontraditional careers and occupations.
• **9.3.4.A.5:** Locate career information using a variety of resources.
	• **Inspire Science Videos**
	  ○ Chloe: Carpenter
	  ○ Sun Rising
	  ○ Hugo: Meteorologist
	  ○ The Sun Throughout the Day
	  ○ Hannah: Welder
	  ○ Shade From the Sun
	• **Inspire Science Digital Interactives**
	  ○ Temperatures Throughout the Day
	• **Discovery Education**
	  ○ Sun
	• **Mystery Science**
	  ○ How Could You Walk Barefoot Across the Pavement Without Burning Your Feet?
	  ○ How Could You Warm Up a Frozen Playground?
	  ○ Why Does It Get Cold In Winter?
	• **Generation Genius**
	  ○ Patterns In the Sky
	• **Google Classroom Virtual Assignments**
	• **Bill Nye "Plants and Animals" Videos**
	  ○ Energy
	  ○ The Sun
	• **Crash Course Kids**
	  ○ Energy and the Sun
		• **Carpenter:**
		  ○ Introduce Career Kid Chloe, who wants to be a carpenter when she grows up. A carpenter builds things out of wood. They build houses, fences, decks and roofs.
		• **Meteorologist:**
		  ○ Introduce Career Kid Hugo, who wants to be a meteorologist when he grows up. A meteorologist is a person who studies the weather. They can predict what the weather will be like in the future.
		• **Welder:**
		  ○ Introduce Career Kid Hannah, who wants to be a welder when she grows up. A welder uses fire to connect pieces of metal. Welders work with torches and melted metal. They help build machines, cars and bridges.

Stage 3 – Learning Plan

UNIT VOCABULARY

• cool • shade • warm	• Earth • sun	• heat • temperature

SUMMARY OF KEY LEARNING

Lesson 1: Sunlight and Earth's Surface

Lesson 1: Day 1 - Sunlight and Earth's Surface - Module Opener

- **Learning Intention:** I am learning the impact that the sun's energy has on the Earth.
- **Success Criteria:** I can make initial explanations of the phenomenon by observing a photo of a sunny playground.
- **Brief Overview of Lesson:** Students will be introduced to the **Module Phenomenon** of *a sunny playground* by looking at a photo. Students will think of questions about how the camel might get what it needs to survive in its environment. The teacher will ask questions about the photo to lead a class discussion. Students will be introduced to the vocabulary words that they will see throughout the module. Students will learn about the **STEM Career Kid Connection** - *Carpenter* and answer questions about the career.

Lesson 1: Day 2 and 3 - Sunlight and Earth's Surface - Assess and Engage

- **Learning Intention:** I am learning that the sun affects the Earth' surface.
- **Success Criteria:** I can choose the friend they think has the best idea about what made the sand warm by completing the Page Keeley Science Probe. I can make initial explanations of the phenomenon by observing a video of the sun rising.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe** - *Warm Sand*. This is intended to serve as a pre-assessment and uncover students' basic ideas about sunlight and the Earth's surface and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *the sun rising.* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Meteorologist* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question** - *How does the Sun affect Earth's surface?*

Lesson 1: Day 4 - Sunlight and Earth's Surface - Explore

- **Learning Intention:** I am learning that the Sun's energy increases the temperature.
- **Success Criteria:** I can investigate what happens to water when it is exposed to the Sun by completing the Inquiry Activity, *Sunlight and Water*.
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity** - *Sunlight and Water*. Students will make a prediction, carry out an investigation, and discuss their observations with the class. The teacher will conclude the lesson by asking a question about the activity.

Lesson 1: Days 5, 6, 7, and 8 - Sunlight and Earth's Surface - Explain

- **Learning Intention:** I am learning the effect of sunlight on Earth Surface.
- **Success Criteria:** I can answer guided comprehension questions about the text, *Earth and the Sun.* I can decide whether to change or justify my responses by revisiting the Page Keeley Science Probe.
- **Brief Overview of Lesson:** Students will be introduced to the vocabulary that they will see throughout the module. Students will view a video *The Sun Throughout the Day* and answer questions. After the video, students will talk with a partner and share their observations, using the new vocabulary. The teacher will use a **Talk About It** question to assess student understanding. The teacher will read the **Science Paired Read Aloud** - *Earth and Sun*, showing students pictures from the text. Students will answer questions about the text and discuss their answers with the class. Students will revisit the **Page Keeley Science Probe** - *Warm Sand*.

Lesson 1: Day 9 and 10 - Sunlight and Earth's Surface - Elaborate

- **Learning Intention:** I am learning the differences in light and temperature when the Sun is out and when it is not out.
- **Success Criteria:** I can investigate if the Sun can warm rocks, soil, and sand by completing the Inquiry Activity, *Sunlight and Earth's Surface.* I can discuss the differences in light and temperature when the Sun is out and when it is not by sharing their observations from the investigation, *Sunlight and Earth's Surface.*

- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Sunlight and Earth's Surfac*e. Students will make a prediction, carry out an investigation, record their observations and discuss with the class. The teacher will wrap up the lesson by asking students to reflect on the activity.

Lesson 1: Day 11 and 12 - Sunlight and Earth's Surface - Evaluate

- **Learning Intention:** I am learning that the sun moves daily.
- **Success Criteria:** I can use what I have learned about the Sun by giving a news report about it.
- **Brief Overview of Lesson:** Students will be giving a news report about the sun. Have students recall what happened when they put things in the Sun. Students should predict that when the Sun goes down, it will get dark and become cooler. Students will revisit the **Essential Question** and take the Lesson 1 assessment.

Lesson 2: Sunlight and Shade

Lesson 2: Day 1 and 2 - Sunlight and Shade - Assess and Engage

- **Learning Intention:** I am learning the different ways that we can stay cool in the sun.
- **Success Criteria:** I can choose the friend that I think has the best idea about the shade by completing the Page Keeley Science Probe. I can make initial explanations by observing the phenomenon in a photo of a day at the beach under umbrellas. I can make my initial observations to the essential question: *How can we stay cool in the Sun?* by creating an anchor chart.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Sunlight and Shade.* This is intended to serve as a pre-assessment and uncover students' basic ideas about sunlight and shade and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a day at the beach under umbrellas* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Welder* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How can we stay cool in the Sun?*

Lesson 2: Day 3 and 4 - Sunlight and Shade - Explore

- **Learning Intention:** I am learning that we can create shade and protection from the sun.
- **Success Criteria:** I can investigate sunlight and shade at different times of day by completing the Temperatures Throughout the Day simulation.
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Temperatures Throughout the Day.* Students will make a prediction, carry out an investigation and share their observations by answering questions about the **Digital Interactive.** The teacher will read the **Science Paired Read Aloud -** *Tortoise is Hot.* Students will answer questions about the text during a class discussion.

Lesson 2: Day 5, 6, and 7 - Sunlight and Shade - Explain

- **Learning Intention:** I am learning the different ways that we can create shade to block the sun.
- **Success Criteria:** I can draw my observations about creating shade by watching the video, *Shade from the Sun*. I can decide whether to change or justify my initial responses by revisiting the Page Keeley Science Probe.
- **Brief Overview of Lesson:** Students will be introduced to the vocabulary that they will see throughout the module. The teacher will read the **Science Paired Read Aloud -** *Earth and the Sun*, and answer questions about the text. Students will view a video *Shade From the Sun* and answer questions. The teacher will lead a **Talk About It** discussion and students will draw observations in their **Science** notebooks. Students will revisit the **Page Keeley Science Probe -** *Sunlight and Shade* to change or justify their initial responses.

Lesson 2: Day 8 and 9 - Sunlight and Shade- Elaborate

- **Learning Intention:** I am learning that shelters help protect animals from the sun and other weather.
- **Success Criteria:** I can make a class book by selecting an animal and drawing a shelter for it.

- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Animal Shelters.* Students will select an animal and draw a shelter for it to make a class book. The teacher will read the directions and students will complete the activity and share their pictures with the class. The teacher will then compile the pictures to create a class book. Students will complete the Lesson 2 assessment.

Lesson 2: Day 10 and 11 - Sunlight and Shade - Evaluate

- **Learning Intention:** I am learning that we can reduce the warming effects of sunlight.
- **Success Criteria:** I can use the engineering skills that I have developed to ensure that my selected animal has some shade by drawing it a shelter.
- **Brief Overview of Lesson:** Students will complete the **Performance Task -** *Draw an Animal Shelter.* The teacher will use a **Talk About It** question to check students' understanding. Students will complete the *Energy and the Sun* **Module Assessment.**

Lesson 2: Day 12 - Sunlight and Shade - Module Wrap-Up

- **Learning Intention:** I am learning that we can reduce the warming effects of sunlight.
- **Success Criteria:** I can reduce the warming effect of sunlight on the school playground by designing and building a structure.
- **Brief Overview of Lesson:** Students will complete the **Performance Project -** *Design a Structure to Make Shade.* The students will define a problem, carry out an investigation, and explain what they built by using key vocabulary learned throughout the module.

CULTURALLY RESPONSIVE TEACHING in PRACTICE	SOCIAL EMOTIONAL LEARNING in PRACTICE
● Search for famous scientists in the field of "Energy and the Sun." ● Search for current events related to solar energy. ● Try to find examples of a Carpenter, Meteorologist, and Welder from different cultures.	● Responsible Decision-Making ○ Making ethical, constructive choices about personal and social behavior. ● Relationship Skills ○ Forming positive relationships, working in teams, dealing effectively with conflict.

Lesson 1:	**Sunlight and Earth's Surface**	**Estimated Time: 12 days (45 minutes per day)**

Brief Overview of Lesson:

- **Day 1:** Students will be introduced to the **Module Phenomenon** of *a sunny playground* by looking at a photo. Students will think of questions about how the camel might get what it needs to survive in its environment. The teacher will ask questions about the photo to lead a class discussion. Students will be introduced to the vocabulary words that they will see throughout the module. Students will learn about the **STEM Career Kid Connection -** *Carpenter* and answer questions about the career.
- **Day 2 and 3:** Students will complete the **Page Keeley Science Probe -** *Warm Sand.* This is intended to serve as a pre-assessment and uncover students' basic ideas about sunlight and the Earth's surface and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *the sun rising.* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Meteorologist* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How does the Sun affect Earth's surface?*
- **Day 4:** Students will complete the **Inquiry Activity** - *Sunlight and Water.* Students will make a prediction, carry out an investigation, and discuss their observations with the class. The teacher will conclude the lesson by asking a question about the activity.
- **Days 5, 6, 7, and 8:** Students will be introduced to the vocabulary that they will see throughout the module. Students will view a video *The Sun Throughout the Day* and answer questions. After the video, students will talk with a partner and share their observations, using the new vocabulary. The teacher will use a **Talk About It** question to assess student understanding. The teacher will read the **Science Paired Read**

Aloud - *Earth and Sun*, showing students pictures from the text. Students will answer questions about the text and discuss their answers with the class. Students will revisit the **Page Keeley Science Probe -** *Warm Sand*.

- **Day 9 and 10:** Students will complete the **Inquiry Activity -** *Sunlight and Earth's Surfac*e. Students will make a prediction, carry out an investigation, record their observations and discuss with the class. The teacher will wrap up the lesson by asking students to reflect on the activity.
- **Day 11 and 12:** Students will be giving a news report about the sun. Have students recall what happened when they put things in the Sun. Students should predict that when the Sun goes down, it will get dark and become cooler. Students will revisit the **Essential Question** and take the Lesson 1 assessment.

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

- The Sun is a star, just like the ones you see in the sky at night. However, it is much closer to Earth than any other star, so it appears bigger and brighter. The Sun is 93 million miles away from Earth and it is 4.5 billion years old. The Sun rises in the east, appears to move across the sky, and it sets in the west. The Sun continuously produces energy from its hydrogen fusion reactions. The Sun is the primary source of energy for Earth. The Sun's energy affects Earth's surface in many ways. It warms the soil, rocks, water, and air. For example, sunlight provides the energy for the water cycle and photosynthesis. The Sun also affects Earth's seasons.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
PS3.B: Conservation of Energy and Energy Transfer • Sunlight warms Earth's surface. (K-PS3-1, K-PS3-2)	• Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. • Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.

Focus Question for this Lesson

How does the Sun affect Earth's surface?

Learning Intention	**Success Criteria**
I am learning that the sunlight impacts the surface of the Earth.	*I can conduct investigations and make observations to explain the effect of sunlight on Earth's surface.*

Assessment(s)

- Page Keeley Science Probe - Warm Sun (Lesson 1)
- Performance Task - Give a News Report (Lesson 1)
- Energy and the Sun Lesson 1 Test

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

- Rubrics
- Student self-regulation or self-monitoring
- Peer Evaluation
- Lesson Trackers

- Aggressive Monitoring
- Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS
Anticipated Student Pre-Conceptions/Misconceptions
● Students may think that day and night are caused by the Sun revolving, or traveling in a path around Earth, or by Earth revolving around the Sun. Reinforce the patterns of day and night by demonstrating with a globe and a lamp to represent the Sun. Spin the globe to show how the side of Earth that faces the Sun has daytime and the side that faces away from the Sun has nighttime. Explain that at night, we are in Earth's shadow.
Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

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.
Plan for tiered learning

THE LESSON IN ACTION: Lesson 1, Day 1 - Module Opener

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

Lesson Opening

Do Now:

- **ASK:**
  - How does the sun make you feel when you go outside?

During the Lesson

Module Opener:

- Introduce the module phenomenon by showing the photo of a sunny playground.
- **ASK:**
  - What do you see on the playground?
  - What do you think the Sun does to the playground?
  - Do you wonder if some areas might be hot?
- Use the questions below to elicit more student responses:
  - Where do you think it would be hot to sit? *(Sample answers: on the slide, in the Sun)*
  - Where would it be cool to sit? *(Sample answers: the grass, the shade)*
  - Why do you think some places are hotter than others? *(Sample answer: The Sun is shining on some things but not others.)*
- Read Chloe's question in the **Science Notebook**.
  - Read aloud the activity text, and then have students draw pictures of what they wonder about the Sun shining on the playground.

Introduce Key Vocabulary:

- *cool, Earth, heat, shade, Sun, temperature and warm*
- Display the teacher presentation slide, and read the Key Vocabulary that students will learn in this module.
  - These words are a selection of important vocabulary that will be used throughout the module. Encourage students to listen for these Key Vocabulary words as they complete the module.

STEM Career Kid Connection: Carpenter

- Display the teacher presentation slide to introduce Chloe to students.
  - Have them share their ideas about what a carpenter might do. Say that carpenters build things out of wood. They build houses and fences. They build decks and roofs. Share with students that Chloe is curious about ways to keep the playground from getting too hot.
- Provide this scenario for students: Suppose the principal says you cannot play on the playground because it is too hot. What can you do to help solve this problem?
- Tell students that Chloe wonders what she could build to help keep parts of the playground cooler.
  - Allow time for students to discuss their models in their **Science Notebook** with a partner.
  - Guide them in talking about how wood and a hammer might help Chloe do her job.

Lesson Closing

Science and Engineering Practices:

- **I will** *carry out an investigation.*
- **I will** *design a solution.*
- **I will** *make a model*.
- Read with students the "I will . . ." statements in their **Science Notebook**. The "I will . . ." statements for this lesson reference Science and Engineering Practices.
    - If this is the first time you are teaching these science and engineering practices, tell students that they can carry out an investigation by observing and collecting data. They can design a solution by working on a design that will help them play on a hot playground. Ask students for other ideas they have about carrying out an investigation and designing a solution.

THE LESSON IN ACTION: Lesson 1, Day 2 and 3 - Assess and Engage

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

Lesson Opening

Do Now:

- **ASK:**
    - Describe the job of a carpenter. Do you know anybody who has this job?

During the Lesson

Assess Lesson Readiness- Page Keeley Science Probe: Warm Sand

- Introduce the probe by telling students that three friends are walking on a beach.
    - The friends started out in bare feet, but put shoes on because the sand was so warm beneath their bare feet.
    - They each have a different idea about what warmed the sand.
- Point to each character, say the character's name, and read aloud what each character is saying about the sand to students.
    - Make sure students understand what each character is saying.
- Then ask the students to choose the friend they think has the best idea about what made the sand warm.
    - Make sure they focus on the characters' ideas and not the characters' looks, name, or other features they like the most.
- 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.
    - Use their ideas to plan instruction during the module that will address their misconceptions and help them gain new knowledge and use appropriate terminology.
    - The probe should be revisited again after students have had the opportunity to develop conceptual understanding and use scientific concepts and terminology to explain their new thinking.

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 the Sun rising.
- Show the phenomenon video, and ask students what questions they have about the video.
- Read with students the text in the **Science Notebook**.
    - If students are having trouble generating their own questions, 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 rising sun?
  - What did you wonder about what you saw in the video?
  - What interests you about the video?
- Then have students use their **Science Notebook** to draw a picture of what they saw in the video.
- 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. Record the questions so you can reference them later.

STEM Career Kid Connection: Meteorologist

- Introduce Career Kid Hugo, who wants to be a meteorologist when he grows up.
- Read to students what Hugo wonders in the **Science Notebook**.
- Ask students to share what they might already know about weather.
- **ASK**:
  - Why would a meteorologist want to know about the Sun? *(Sample answer: Meteorologists need to know how the Sun affects weather.)*
  - How does the Sun affect weather? *(Sample answers: The Sun can make things hot; the Sun can be blocked, which causes a cloudy day.)*

Essential Question: *How does the Sun affect Earth's surface?*

- Read aloud to students the Essential Question in the **Science Notebook** as students follow along. 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.
  - Explain that 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.
- Record students' ideas about the **Essential Question** on chart paper or the whiteboard so you can reference them throughout the lesson.
- **ASK**:
  - Where was the Sun in the video? *(Sample answer: First, the Sun was behind the buildings. Then it appeared to rise high in the sky.)*
  - What was happening as the Sun appeared to rise? *(Sample answer: The sky began to get light.)*
  - How do you think it might start feeling outside as the Sun appears to move higher in the sky? *(Sample answer: It might begin to feel warm outside.)*

Lesson Closing

Science and Engineering Practices: **I will** *carry out an investigation*.

- Have students follow along as you read the "I will . . ." statement in the **Science Notebook.** Throughout the lesson, students will carry out an investigation. If this is the first time you are teaching the Science and Engineering Practice of carrying out an investigation, explain that an investigation is a way to answer a question by following a plan. Emphasize the importance of following a plan. If the words in the skill are unfamiliar, then provide definitions and use each word in a sentence.
- **ASK**:
  - Why do scientists need to carry out an investigation to find answers to questions? *(Sample answer: Scientists need to collect evidence to help them answer questions.)*
- Explain to students that by the end of the lesson, they will carry out investigations to explain how the Sun affects Earth's surface.

THE LESSON IN ACTION: Lesson 1, Day 4 - Explore

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

Lesson Opening

Do Now:

- **ASK:**
  - How do you think it might start feeling outside as the Sun appears to move higher in the sky?

During the Lesson

Inquiry Activity - Sunlight and Water:

- Students will investigate what happens to water when it is exposed to the Sun.

Advanced Preparation

- One cup per student, thermometers, timers, and a source of water.
- Remind students that they just watched a video that showed the Sun. Now they will investigate a way the Sun affects Earth.
- Help students make a prediction.
  - Remind them that a prediction is a guess based on what they think will happen.
- Read the Make a Prediction question in the **Science Notebook.**
  - Students should circle an answer to predict what will happen.
- **ASK**:
  - Predict what will happen to the water. *(Sample answer: It will get warm.)*
  - Predict what the water will feel like. *(Sample answer: It will feel warmer.)*

Carry Out an Investigation:

- Read the steps of the investigation on the teacher presentation slide. Then have students conduct the investigation to see if their predictions come true.
- Guide students in recording their data in their **Science Notebook**. Help students color in the thermometers to show the temperature readings they collected.

Talk About It:

- Have students share their observations and data with those of their classmates.
- **ASK**:
  - What happened to the temperature of the water in the Sun? *(Sample answer: After the water sat in the Sun, the temperature went up.)*
  - Why did the temperature change? *(Sample answer: The Sun made the temperature change.)*
  - Look at your prediction. Were you able to discover if sunlight makes water warmer? *(Sample answer: Yes, the water warmed up.)*

Lesson Closing

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 one thing can cause another to happen. For example, the heat from the Sun can cause another thing to get hot.
- **ASK:**
  - What did the Sun cause to happen to the water? *(Sample answer: The Sun caused the water to become warmer.)*
- Help students apply what they have learned in order to circle the correct thermometer in their **Science Notebook**.

THE LESSON IN ACTION: Lesson 1, Day 5, 6, 7, and 8 - Explain

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

Lesson Opening

Do Now:

- **ASK:**
  - What did the Sun cause to happen to the water?

During the Lesson

Obtain and Communicate Information: Vocabulary

- Have students read the vocabulary words listed in their **Science Notebook**. 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 add the words to a word wall to reference them throughout the lesson. Explain to students that they will see the words used in the content that they will be learning.
    - **Earth**- the planet on which we live
    - **heat**- when the air feels hot
    - **Sun**- the star closest to Earth
    - **temperature**- how hot or cold something is
    - **warm**- somewhat hot; not cool or cold

The Sun Throughout the Day video:

- Have students watch the video about the Sun throughout the day.
- **ASK**:
  - What happened in the video? *(Sample answer: The Sun appeared to come up in the morning. The Sun made it lighter and warmer outside. The temperature got higher. The Sun appeared to go down at night.)*
  - What does the Sun do for us each day? *(Sample answer: The Sun gives light and makes us warm.)*
  - What do you think the Sun does for Earth? *(Sample answer: The Sun gives Earth light and warms Earth's surface.)*
- After the video, have students talk with a partner about what they observed. Encourage them to use vocabulary words.
- Have students draw what they talked about in their **Science Notebook**.

Develop Vocabulary:

- **heat; warm**
  - The video uses the word heat to name something the Sun gives Earth. It uses *warm* to describe conditions on Earth. Help students understand that these words can be used to describe actions, too. For example, the Sun warms Earth and heats Earth.

Talk About It:

- Use the *Talk About It* question to assess students' understanding of what they have learned. If students do not demonstrate understanding of how the Sun affects Earth, revisit some of the activities in this lesson.
- **ASK**:
  - What does the Sun do to Earth? *(Sample answer: The Sun can make Earth warm or hot. It can dry things out.)*

Earth and the Sun Read Aloud:

- Show students the pictures of Earth and the Sun beginning the Science Paired Read Aloud.
- Ask students to identify Earth and the Sun shown in the pictures.
- Read aloud the text.

- Be sure students understand that the Sun is much, much bigger than Earth even though the picture of Earth is larger than that of the Sun.
- **ASK:**
  - What does the Sun give off? *(Sample answer: light and heat)*
  - What is the Sun? *(Sample answers: a star)*
  - How often does Earth travel around the Sun? *(Sample answer: once a year)*
- Have students draw a model of how Earth goes around the Sun in their **Science 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
- **ASK**:
  - What does the Sun do for Earth?
- Complete the graphic organizer as a class. If students were not able to fill in the spaces, review how the Sun affects Earth.

Reflect and Refine: Warm Sand

- 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 how the Sun affects Earth's surface. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

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 one thing can cause another to happen. For example, Earth's spinning motion causes night and day.
- **ASK:**
  - What is the result of Earth's trip around the Sun? *(Sample answer: one year on Earth)*

Lesson Closing

Science and Engineering Practices: **I can** *carry out an investigation*.

- Read aloud the "I can . . ." statement in the **Science Notebook**. Have the class say the "I can . . ." statement together. Then have students tell a partner what they can do. The "I can . . ." statement for this lesson references the Science and Engineering Practice of carrying out an investigation.
- **ASK**:
  - What can you do to carry out an investigation? *(Sample answer: I can place water in the sunlight to investigate how the Sun affects Earth.)*

THE LESSON IN ACTION: Lesson 1, Day 10 - Elaborate

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

Lesson Opening

Do Now:

- **ASK:**
  - What does the Sun do for the Earth?

During the Lesson

Research, Investigate, and Communicate

Inquiry Activity - Sunlight and Earth's Surface

- Students will investigate if the Sun can warm rocks, soil, and sand. The Sun will warm all of the materials, although some may feel warmer than others.
- Help students make a prediction.
    - Remind them that a prediction is a guess based on what they think will happen.
- Have students predict by circling the items the Sun can warm in their **Science Notebook.** Then have them explain their predictions based on previous observations.

Advanced Preparation

- Gather sand, rocks, and soil.

Carry Out an Investigation:

- Read the steps of the investigation with students. Help students set a timer for 30 minutes. You may need to let students know when 30 minutes have passed. Tell them it is time to check the temperature of the objects.
- **ASK**:
    - How will you know if each object has changed temperature? *(Sample answer: I touched the items before they were in the sun, and now I am touching them again. I will notice if the object has changed temperature after being in the Sun.)*

Talk About It:

- Have students share their observations from the investigation.
- **ASK**:
    - What happened to the temperature of the sand, rocks, and soil in the sunlight? *(Sample answer: Each of the things got warmer.)*
    - Why do you think this happened? *(Sample answer: The Sun made the temperature change.)*
    - Which material had the highest temperature? (Sample answer: the sand)
    - Did you predict what happened? *(Sample answer: Yes, but I did not know one material would be warmer than the others.)*

Lesson Closing

Crosscutting Concepts- Cause and Effect

- As you review the Crosscutting Concept of cause and effect, remind students that sunlight warms Earth's surface. For example, the heat from the Sun can cause another thing to get hot.
- **ASK**:
    - What did the Sun cause to happen to the sand, rocks, and soil? *(Sample answer: The Sun caused their temperature to rise.)*

THE LESSON IN ACTION: Lesson 1, Day 11 and 12 - Evaluate

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

Lesson Opening

Do Now:

- **ASK:**
    - What did the Sun cause to happen to the sand, rocks, and soil?

During the Lesson

Performance Task - Give a News Report

- Students will use what they have learned to give a news report about the Sun.
    - Help students as needed to articulate the sequence of events: first the Sun comes up, then Earth gets light, and next the Sun goes higher and makes Earth warmer.

Construct an Explanation

- Read aloud the activity instructions in the **Science Notebook**. Have students recall what happened when they put things in the Sun. Students should predict that when the Sun goes down, it will get dark and become cooler.

Crosscutting Concepts- Cause and Effect

- As you review the Crosscutting Concept of cause and effect, help students understand that a cause makes something happen and an effect is what happens. Students should recognize cause and effect in the activities they have completed in this lesson.
- **ASK**:
    - What is different about when the Sun is shining and when it is not? Students should discuss the differences in light and temperature that occur depending on whether the Sun is shining or not.

Essential Question: *How does the Sun affect Earth's surface?*

- Revisit the lesson phenomenon video. Have students watch the video and think about the answer they gave to this question originally. Refer to the answers you recorded to this question at the beginning of the lesson, and see if and how students' thinking has changed.
- Discuss and share their answers as a large group.
    - Write a single sentence that captures students' thinking.
- Have students copy the answer to the Essential Question in their **Science Notebook**. Help students who may struggle with the writing task.

Lesson Closing

Science and Engineering Practices: I did *carry out an investigation*.

- Refer to the "I will . . ." and "I can . . ." statements in the **Science Notebook**.
- **ASK**
    - Read together as a class the "I did . . ." statement in their **Science Notebook**.

Lesson 1 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Lesson 2:	**Sunlight and Shade**	**Estimated Time: 12 days (45 minutes per day)**
Brief Overview of Lesson:		

- **Day 1 and 2:** Students will complete the **Page Keeley Science Probe -** *Sunlight and Shade.* This is intended to serve as a pre-assessment and uncover students' basic ideas about sunlight and shade and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a day at the beach under umbrellas* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Welder* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How can we stay cool in the Sun*
- **Day 3 and 4:** Students will complete the **Inquiry Activity -** *Temperatures Throughout the Day.* Students will make a prediction, carry out an investigation and share their observations by answering questions about the **Digital Interactive.** The teacher will read the **Science Paired Read Aloud -** *Tortoise is Hot.* Students will answer questions about the text during a class discussion.
- **Day 5, 6, and 7:** Students will be introduced to the vocabulary that they will see throughout the module. The teacher will read the **Science Paired Read Aloud -** *Earth and the Sun,* and answer questions about the text. Students will view a video *Shade From the Sun* and answer questions. The teacher will lead a **Talk About It** discussion and students will draw observations in their **Science** notebooks. Students will revisit the **Page Keeley Science Probe -** *Sunlight and Shade* to change or justify their initial responses.
- **Day 8 and 9:** Students will complete the **Inquiry Activity -** *Animal Shelters.* Students will select an animal and draw a shelter for it to make a class book. The teacher will read the directions and students will complete the activity and share their pictures with the class. The teacher will then compile the pictures to create a class book. Students will complete the Lesson 2 assessment.
- **Day 10 and 11:** Students will complete the **Performance Task -** *Draw an Animal Shelter.* The teacher will use a **Talk About It** question to check students' understanding. Students will complete the *Energy and the Sun* **Module Assessment.**
- **Day 12:** Students will complete the **Performance Project -** *Design a Structure to Make Shade.* The students will define a problem, carry out an investigation, and explain what they built by using key vocabulary learned throughout the module.

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

- Energy from the Sun reaches Earth and warms its surface and things on its surface. Structures, such as tents, awnings, and canopies, block some of the Sun's heat and provide shade. Blocking the Sun's energy lowers the temperature underneath. Items, such as wide-brimmed hats and umbrellas, also provide shade and help keep people cooler when they are outside in the Sun.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
PS3.B: Conservation of Energy and Energy Transfer ● Sunlight warms Earth's surface. (K-PS3-1, K-PS3-2)	● Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ● Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.

Focus Question for this Lesson	
How can we stay cool in the Sun?	
Learning Intention	**Success Criteria**
I am learning the different ways that we can stay cool in the sun.	*I can design a structure that will reduce the warming effect of sunlight on an area.*

Assessment(s)
• Page Keeley Science Probe - Sunlight and Shade (Lesson 2) • Performance Task - Perfect Plant (Lesson 2) • Plants and Animals Lesson 2 Test
Feedback (Peer to peer/student to teacher/teacher to student)
• Rubrics • Student self-regulation or self-monitoring • Peer Evaluation • Lesson Trackers • Aggressive Monitoring • Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS
Anticipated Student Pre-Conceptions/Misconceptions
• Students may think that sunlight will not pass through clouds. However, the Sun's energy (UV) is still passing through the clouds. A person can get sunburned on a cloudy day. Students may think that blocking the Sun does not make an outdoor area cooler. Comparing thermometer readings in sun and shade demonstrates that shade does lower the temperature.
Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

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.
Plan for tiered learning

THE LESSON IN ACTION: Lesson 2, Day 1 and 2 - Assess and Engage

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

Lesson Opening

Do Now:

- **ASK:**
  - What do you do when you get too hot outside in the sun?

During the Lesson

Assess Lesson Readiness - Page Keeley Science Probe: Sunlight and Shade

- Introduce the probe by first asking students what the difference is between a shady area and a sunny area. Ask them what they think makes the shade.
  - Introduce the probe by telling the students that two friends are playing outside on a hot, sunny day.
  - The friends each have a different idea about moving into the shade to play.
  - Point to each character, say the character's name, and read what the character is saying aloud to students.
  - Make sure students understand what each character is saying. Then ask the students to choose the friend they think has the best idea about the shade.
    - Make sure they focus on the characters' ideas and not the characters' looks, name, or other features they like the most.
  - 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. Use their ideas to plan instruction during the module that will address their misconceptions and help them gain new knowledge and use appropriate terminology.
  - The probe should be revisited again after students have had the opportunity to develop conceptual understanding and use scientific concepts and terminology to explain their new thinking.

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 day at the beach under umbrellas. Show the photo, and ask students what questions they have about the umbrellas.
  - Help students turn their observations from the photo into questions that they can refer to during the lesson and record them on the board or chart paper.
  - 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. If students are having trouble generating their own questions, 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 photo?
  - What did you notice about the umbrellas?
  - What did you wonder about what you saw in the photo?
  - What interests you about the photo?
- Have students draw what it would feel like if there were no umbrellas in their science notebook.

STEM Career Kid Connection: Welder

- Introduce Career Kid Hannah, who wants to be a welder when she grows up. A welder uses torches and metal to put things together.
- Read aloud what Hannah says in their science notebook.
- **ASK:**
  - Why would a welder be interested in the Sun and sunlight? *(Sample answer: Welders build things to keep people out of the Sun.)*
  - What do welders have to do with shade? *(Sample answers: A welder can build something to make shade.)*
- Show students the video to introduce Career Kid Hannah. Ask students what they learned about Hannah.

Lesson Closing

Essential Question- How can we stay cool in the Sun?

- Read aloud to students the Essential Question in their science 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 that 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.
- Record students' answers, as well as their thoughts and questions about the Essential Question by using chart paper or the board so you can reference them throughout the lesson.

Science and Engineering Practices:

- **I will** *design a solution.*
- **I will** *make a model*.
- Have students follow along as you read the "I will . . ." statements in the science notebook.
  - Throughout the lesson, students will design solutions and make models relating to Sun and shade. If this is the first time you are teaching these Science and Engineering Practices, explain that sometimes people build things to solve problems. Before they build, they have to design what they will build and then make a model of it.
- **ASK:**
  - How will you design a solution? *(Sample answer: I will try to solve a problem or answer a question.)*
  - How will you make a model? *(Sample answer: I will show how to build something to solve a problem.)*

THE LESSON IN ACTION: Lesson 2, Day 3 and 4 - Explore

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

Lesson Opening

Do Now:

- **ASK:**
  - What is the career of a Welder like?

During the Lesson

Inquiry Activity - Temperatures Throughout the Day

- Students will investigate sunlight and shade at different times of day.

Carry Out an Investigation

- How to Use the Simulation: Students click the OK button to start the simulation.

- Point out the two identical sets of food on the picnic table and the two thermometers. Then point out the Sun buttons on the bottom left of the screen. *(Students may not know left from right, so it is important to make sure they understand where on the screen the Sun buttons are located.)* Students choose one of the Sun buttons to represent different times of day. When a button is clicked, the thermometers will change to show the temperature at that time of day. Point out the shade buttons on the bottom right of the screen. Students will select one of the buttons to represent different amounts of shade. The thermometer on the right will change to show the shade's effect on temperature.

Talk About It:

- Have students share their observations from the simulation.
- **ASK**:
  - What item did you pick to add shade? *(Sample answer: I chose the lattice roof. It made the temperature go down.)*
  - What did you observe when the Sun was at different levels in the sky? *(Sample answer: When the Sun was low, the temperatures were cooler. When the Sun was high, the temperatures were hotter.)*
  - Which item made the temperature cool down the most? *(Sample answer: The umbrella made the temperature decrease the most.)*

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 one cause can have more than one effect. For example, the Sun can cause something to be easier to see but also causes it to get warm.
- **ASK:**
  - What causes shade? *(Sample answer: blocking the Sun)*

Lesson Closing

Tortoise is Hot Read Aloud:

- Show students the pictures in *Tortoise Is Hot* in the **Science Paired Read Aloud**.
- Ask students to identify the things that block the Sun.
- Read aloud the text.
  - Be sure students understand that any item that blocks the Sun will cause shade.
- **ASK**:
  - What does each animal do to stay cool? *(Sample answer: Peccary rests in the shade, Prong raises the hair off her back, and Wren perches in a shady bush.)*
  - How do these things help? *(Sample answer: They all help to block the Sun.)*
  - What does Tortoise decide to do? *(Sample answer: He goes home to his cool underground burrow.)*
  - How does Tortoise's home keep him cool? *(Sample answer: It blocks the heat of the Sun.)*

THE LESSON IN ACTION: Lesson 2, Day 5, 6, and 7 - Explain

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

Lesson Opening

Do Now:

- **ASK:**
  - Choose one example of an animal and describe what it does to stay cool.

During the Lesson

Obtain and Communicate Information - Vocabulary:

- Read the vocabulary words listed below. 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 add the words to a word wall so students 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.
    - **cool**- somewhat cold, not warm or hot
    - **shade**- the dark area caused when light is blocked

Visual Kinesthetic Vocabulary:

- Have students cut out and fill in the Dinah Zike Visual Kinesthetic from their **Science Notebook**. Students can fold and tape the page as indicated. Then they can place their vocabulary blocks on their desks or tables to manipulate and refer to as they work through the lesson.

Earth and the Sun Read Aloud:

- Show students the pictures in the Science Paired Read Aloud Earth and the Sun. Read the text as students follow along. Ask students to identify the things that block the Sun. Be sure students understand that any item that blocks the Sun will cause shade.
- **ASK:**
    - What two things does the Sun give? *(Sample answer: light and heat)*
    - What can happen when there is too much sunlight? (Sample answer: You get hot and need water.)
    - How do people stay cool when there is too much sunlight? *(Sample answer: They make shade or get in the shade.)*
- Have students talk about the reading with a partner. Ask them to use the new vocabulary words as they discuss how they can make shade and how shade can keep them cool.

Shade from the Sun video:

- Have students watch the video about shade from the Sun.
- **ASK:**
    - Why do people create shade? *(Sample answer: Shade helps you stay cool.)*
    - What is one example of shade you saw in the video? *(Sample answer: umbrella, cabana, baseball cap)*
    - What have you used for shade? *(Sample answer: a tree, an umbrella, a hat)*
- Have students draw what they observed in the video in their **Science Notebook**.

Talk About It:

- Read aloud the question in the **Science Notebook**.
- Have students draw their thoughts about how things are different in sunlight and in shade. Then have them share their ideas with the class.
- Use the **Talk About It** question to assess students' understanding of what they have learned so far.
    - If students do not demonstrate understanding about sunlight and shade, then have them revisit some activities in this 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
- **ASK**:
    - What happens when something blocks the sun? *(Sample answer: It is cooler in shade; it prevents harm from the Sun.)*
- Complete the graphic organizer as a class.
    - If students were not able to identify effects of the Sun, have them use the "Temperatures Throughout the Day" simulation again.

Reflect and Refine: Sunlight and Shade

- 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 sunlight and shade. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

Lesson Closing

Science and Engineering Practices:

- *I can design a solution.*
- *I can make a model.*
- Read aloud the "I can . . ." statements in the **Science Notebook**.
- Have the class say the statements together.
    - Then have students tell a partner what they can do.
    - One of the "I can . . ." statements for this lesson references the Science and Engineering Practice of designing solutions.
- **ASK**:
    - What can you do to design a solution? *(Sample answer: I can design a solution to make shade.)*

THE LESSON IN ACTION: Lesson 2, Day 8 and 9 - Elaborate

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

Lesson Opening

Do Now:

- **ASK:**
    - What two things does the Sun give?

During the Lesson

Research, Investigate, and Communicate: Inquiry Activity - Animal Shelters

- Students will select an animal and draw a shelter for it to make a class book.
- Read aloud the steps in the **Science Notebook**.
- Have students complete the activity and share their pictures with the class. Then compile the pictures to create a class book.

Advanced Preparation:

- Collect magazines that show animals, or print out animal photos from online sources.

Talk About It:

- Invite students to share how the shelter they drew helps their animal.
- **ASK:**
    - How do shelters protect animals from the Sun? *(Sample answer: They block the Sun so animals do not get too hot.)*
    - How do animals in nature protect themselves from the Sun? *(Sample answers: They find shade, under a tree, in a cave, or in a burrow.)*
    - What problem did your shelter solve? *(Sample answers: It kept my animal out of the hot Sun by providing shade.)*

Lesson Closing

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 one cause can have more than one effect. For example, the Sun can cause something to be easier to see, but also causes it to get warm.
- **ASK**:
  - What are the effects of blocking the Sun? *(Sample answers: It is cooler and darker where the Sun is blocked. Blocking the Sun causes shade.)*
  - How does your shelter cool an animal? *(Sample answers: The shade blocks the Sun, which lowers the temperature and cools the animal.)*

THE LESSON IN ACTION: Lesson 2, Day 10 and 11 - Evaluate

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

Lesson Opening

Do Now:

- **ASK:**
  - What are the effects of blocking the Sun?

During the Lesson

Performance Task - Draw An Animal Shelter

- Students will select one of the two animals and draw a shelter for it in their ***Science Notebook***.
  - They will use the engineering skills they have developed to ensure that the animal has some shade.
- **ASK:**
  - How did you protect the animal from the Sun? *(Sample answer: I added a roof to keep the animal out of the Sun when it wants to be cooler.)*
  - Is your shelter designed so the animal must be in the shade all the time? *(Sample answers: Yes; if the animal goes in the shelter, it is out of the sun completely. No; only part of the shelter has shade.)*

Talk About It

- **ASK:**
  - What did you find out? *(Sample answers: A shelter for a camel is big. It is hard to design a roof for a camel shelter. An iguana has a small shelter. It is easy to provide a way for an iguana to get out of the sun.)*

Essential Question: *How can we stay cool in the Sun?*

- Have students look at the photo, and refer back to this question in their ***Science Notebook*** and the answers you recorded.
  - Ask them if and how their thinking has changed.
- Discuss and share their answers as a large group.
- Write a single sentence that captures students' thinking. Have students copy the answer to the **Essential Question** in their ***Science Notebook***. Help students who may struggle with the writing task.

Science and Engineering Practices

- *I designed a solution.*
- *I made a model.*
- Refer back to the "I will …" and "I can …" statements in the ***Science Notebook***.
- **ASK:**

- Did you design a solution and make a model? *(Sample answer: I designed a shelter and made a drawing.)*
- Read together as a class the "I did …" statements on page in the ***Science Notebook***.

Lesson Closing

Assessment:

- Students will complete the Lesson 2 assessment

THE LESSON IN ACTION: Lesson 2, Day 12 - Module Wrap-Up

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

Lesson Opening

Do Now:

- **ASK:**
  - How can an animal be protected from the sun?

During the Lesson

Module Wrap-Up: Performance Project

- **Design a Structure to Make Shade**
- Students will design and build a structure that reduces the warming effect of sunlight on the school playground. They will apply knowledge from Lessons 1 and 2 to create effective structures.
- **ASK:**
  - How can you solve the problem that the playground gets too hot?
  - Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on the playground.

Materials

- cardboard, tape, butcher paper, scissors

Purpose

- Students will design and build a structure that reduces the warming effect of sunlight on the playground.

Define a Problem

- Help students think about ways they can block the Sun.

- **ASK:**
  - Where could you put the paper to block the Sun? *(Sample answer: on top of the jungle gym to make shade below)*
  - How could you use cardboard to make shade? *(Sample answer: We could make a roof or go inside a large box.)*

Carry Out An Investigation

- Have students draw the materials they will need in their *Science Notebook*.
- Help students with their designs as needed.
- Assist students in taping the butcher paper in high or hard-to-reach areas.

Talk About It

- Have students explain what they built and why it works to solve the playground problem. Guide students to use the words *heat*, *shade*, *temperature*, *Sun*, and *cool* in the discussion.
- **ASK:**

○ What did you build? *(Sample answer: I put butcher paper between two slides. It made shade below. If you crawl under, you can get out of the heat from the Sun and into the cool area below.)* ○ How did this solve the problem? *(Sample answer: The paper blocked the Sun and reduced the temperature, so the playground was not too hot anymore.)*
Lesson Closing
Assessment: ● Students will complete the **Energy and the Sun Module Assessment**

Lesson 2 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Module 3:
Plants and Animals

Stage 1 – Desired Results

ASSESSED FOCUS STANDARDS:

LS1.C: Organization for Matter and Energy Flow in Organisms

- All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1)

ESS3.A: Natural Resources

- Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)

CONTENT CONNECTIONS:

ELA/Literacy

- **SL.K.5:** Add drawings or other visual displays to descriptions as desired to provide additional detail.
- **W.K.7:** Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).

Mathematics

- **K.MD.A.2:** Directly compare two objects with a measurable attribute in common, to see which object has "more of/less of" the attribute, and describe the difference.
- **MP.2:** Reason abstractly and quantitatively.

Unit Description

Anchoring Phenomenon: A camel in the desert

Statement: Plants and animals need certain things to survive.

Observation/Demonstration/Experience: A video of a camel in the desert.

Driving Question: What do plants and animals need to live?

Meaning

ENDURING UNDERSTANDINGS:

- Living things can grow, change, and reproduce, and they need water, air, food, and space to grow.
- Plants live in many different places on Earth based on the plant's needs.
- Plants use water, carbon dioxide from the air, and energy from light to make food in their leaves.
- Animals need basic things such as food, water, air, and shelter in order to survive.

ESSENTIAL QUESTIONS:

- What do plants and animals need to live?
- Where do different kinds of plants grow?
- Where do different kinds of animals live?

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- **MP.4:** Model with mathematics.
- **K.CC:** Counting and Cardinality

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- Different animals live in different places. The place an animal lives that provides these necessities is called a habitat.
- An environment is all of the things that surround an organism and is made up of a larger area than a habitat.
- An ecosystem is made up of all of the living things and nonliving things in an environment interacting.

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KNOWLEDGE:

- Students will use evidence to explain what plants and animals need to live. (Lesson 1)
- Students will use evidence to show that plants live in places that have the things they need. (Lesson 2)
- Students will develop a model to show that animals live in places that have the things they need. (Lesson 3)

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SKILLS:

- **K-LS1-1:** Use observations to describe patterns of what plants and animals (including humans) need to survive.
  - [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and that all living things need water.]
  - Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.
  - Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
- **K-ESS3-1:** Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
  - [Clarification Statement: Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas, and grasses need sunlight so they often grow in meadows. Plants, animals, and their surroundings make up a system.]

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		○ Use a model to represent relationships in the natural world. ○ Systems in the natural and designed world have parts that work together.

Stage 2 – Evidence

SUMMATIVE ASSESSMENT(S)

- Performance Task - Create a Survival Graph (Lesson 1)
- Plants and Animals Lesson 1 Test
- Performance Task - Perfect Plant (Lesson 2)
- Plants and Animals Lesson 2 Test
- Performance Task - Habitat Model (Lesson 3)
- Plants and Animals Lesson 3 Test
- Plants and Animals Module Performance Project - Make a Diorama
  - Plants and Animals Module Performance Project - Make a Diorama Rubric
- Plants and Animals Module Test
- STEM Gauge #464535
- STEM Gauge #472983
- STEM Gauge #495485
- STEM Gauge #499074

PRE-ASSESSMENT

- Page Keeley Science Probe - Plant and Animal Needs (Lesson 1)
- Page Keeley Science Probe - Places Plants Grow (Lesson 2)
- Page Keeley Science Probe - Places Where Animals Live (Lesson 3)

Integration of 21st Century Skills	Integration of Technology	Career Education
● **9.1.4.A.1:** Recognize a problem and brainstorm ways to solve the problem individually or collaboratively. ● **9.1.4.A.2:** Evaluate available resources that can assist in solving problems. ● **9.1.4.A.3:** Determine when the use of technology is appropriate to solve problems. ● **9.1.4.A.4:** Use data accessed on the Web to inform solutions to problems and the decision-making process. ● **9.1.4.A.5:** Apply critical thinking ● **9.1.4.B.1:** Participate in brainstorming sessions to seek information, ideas, and strategies that foster creative thinking.	● **Inspire Science Videos** ○ Ruby: Veterinarian ○ Camel in Desert ○ Poppy: Park Ranger ○ Chipmunk Eating Nuts ○ Kayla: Landscape Architect ○ Where Do Plants Grow? ○ Deer ○ Jordan: Animal Trainer ○ Where Do Animals Live? ● **Inspire Science Digital Interactives** ○ Rabbit Health ○ What Animals Eat ○ Plants In Different Climates ○ Match the Plants To the Climate ● **Inspire Science Songs**	● **Veterinarian:** ○ Introduce Career Kid Ruby, who wants to be a veterinarian when she grows up. Veterinarians care for animals. They help animals when they are sick. They know how to keep animals healthy. ● **Park Ranger:** ○ Introduce Career Kid Poppy, who wants to be a park ranger when she grows up. Park rangers take care of the visitors, plants and animals in a park. They need to know about how the animals and plants in the park depend on each other. ● **Landscape Architect:** ○ Introduce Career Kid Kayla, who wants to be a landscape architect when she

• **9.1.4.D.1:** Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience. • **9.1.4.E.2:** Demonstrate effective communication using digital media during classroom activities. • **9.3.4.A.2:** Identify various life roles and civic and work-related activities in the school, home, and community. • **9.3.4.A.3:** Appraise personal likes and dislikes and identify careers that might be suited to personal likes. • **9.3.4.A.4:** Identify qualifications needed to pursue traditional and nontraditional careers and occupations. • **9.3.4.A.5:** Locate career information using a variety of resources.	○ Animals Need ○ What Plants Need • **Discovery Education** ○ Ecosystems • **Mystery Science** ○ Why Do Woodpeckers Peck Wood? ○ Where Do Animals Live? ○ How Can You Find Animals in the Woods? ○ How Do Animals Make Their Homes In the Forest? ○ How Do Plants and Trees Grow? ○ Why Would You Want An Old Log In Your Backyard? • **Generation Genius** ○ Pollination and Seed Dispersal ○ Plant Growth Conditions ○ Animals Help Their Babies Survive ○ Plants Need Water and Light ○ Biodiversity of Life on Earth ○ Parts of a Plant ○ Animals Need Food • **Google Classroom Virtual Assignments** • **Bill Nye "Plants and Animals" Videos** ○ Plants ○ Animals • **Crash Course Kids** ○ Videos	grows up. A landscape architect plants flowers and trees. They learn about what plants need to live and where they grow. • **Animal Trainer:** ○ Introduce Career Kid Jordan, who wants to be an animal trainer when he grows up. Animal trainers work with animals.

Stage 3 – Learning Plan

UNIT VOCABULARY

• animal • desert • habitat • nonliving	• Arctic • ecosystem • living • plant	• climate • forest • need • survival

SUMMARY OF KEY LEARNING

Lesson 1: Plant and Animal Needs

Lesson 1: Day 1 - Plants and Animals - Module Opener

- **Learning Intention:** I am learning the needs of plants and animals for survival.
- **Success Criteria:** I can make initial explanations by observing a video of a camel in the desert.

- **Brief Overview of Lesson:** Students will be introduced to the Module Phenomenon of *a camel in the desert* by watching a video. Students will think of questions about how the camel might get what it needs to survive in its environment. The teacher will ask questions about the video to lead a class discussion. Students will be introduced to the vocabulary words that they will see throughout the module. Students will learn about the **STEM Career Kid Connection -** *Veterinarian* and answer questions about the career.

Lesson 1: Day 2 and 3 - Plant and Animal Needs - Assess and Engage

- **Learning Intention:** I am learning the needs shared by both plants and animals.
- **Success Criteria:** I can share my ideas about which things are needed by both plants and animals. I can make initial explanations by observing a chipmunk eating a nut in its natural habitat.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Plant and Animal Needs.* This is intended to serve as a pre-assessment and uncover students' basic ideas about the needs of plants and animals and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a chipmunk eating a nut in its natural habitat* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Park Ranger* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *What do plants and animals need to live?*

Lesson 1: Day 4, 5, and 6 - Plant and Animal Needs - Explore

- **Learning Intention:** I am learning that sunlight impacts how plants grow and change over time.
- **Success Criteria:** I can investigate if a plant needs sunlight to grow by observing how the plants grow and change over the course of several days. I can discuss my observations of the plants each day and sketch what I observed. I can answer guided comprehension questions about the text
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Plant and Animal Needs*. Students will observe two plants, one left in sunlight and the other left in the dark, and compare the changes that occur over several days. Students will make a prediction, carry out an investigation, record their observations, and discuss the investigation with their classmates. The teacher will read the **Science Paired Read Aloud**, *Growing Up* and answer questions about the story. The teacher will wrap-up the lesson asking a **Quick Check** question to assess student understanding.

Lesson 1: Days 7, 8, and 9 - Plant and Animal Needs - Explain

- **Learning Intention:** I am learning that plants and animals need help to survive.
- **Success Criteria:** I can discuss any patterns I found by comparing the two plants with a partner. I can match a plant or animal card with something that will help it survive.
- **Brief Overview of Lesson:** Students will revisit the vocabulary words for this lesson and learn their definitions. The teacher will read the **Science Paired Read Aloud**, *Plant and Animal Needs* and answer questions. Students will complete the **Digital Interactive -** *Rabbit Health*. Students will complete the **Inquiry Activity -** *Picture Cards,* making a prediction, carrying out an investigation and recording their observations. Finally, students will revisit the **Page Keeley Science Probe** to either change or justify their initial responses.

Lesson 1: Day 10 - Plant and Animal Needs - Elaborate

- **Learning Intention:** I am learning that animals need specific food for survival.
- **Success Criteria:** I can determine and make a model to demonstrate what an animal eats.
- **Brief Overview of Lesson:** Students will explore the **Digital Interactive -** *What Animals Eat* to learn about carnivores, herbivores, and omnivores. The teacher will ask questions about the activity and students will make a model of their chosen animal. Students will explain to a partner how what their animal eats helps it to grow and survive.

Lesson 1: Day 11 and 12 - Plant and Animal Needs - Evaluate

- **Learning Intention:** I am learning that the needs of plants and animals are similar to the needs of people.
- **Success Criteria:** I can compare the needs of plants and animals to the needs of people by constructing a graph to show what the plant or animal needs to survive.
- **Brief Overview of Lesson:** Students will complete the **Performance Task -** *Create a Survival Graph* where they will compare the needs of plants and animals to the needs of people. Students will make a model by drawing a plant or animal and all of its needs on one side of a poster; and by drawing all of the things that they (the students) need for survival on the other side of the paper. The teacher will lead a **Talk About It**, asking students to compare their needs to those of different plants and animals. Students will revisit the **Essential Question** and take the Lesson 1 assessment.

Lesson 2: Places Plants Grow

Lesson 2: Day 1 and 2 - Places Plants Grow - Assess and Engage

- **Learning Intention:** I am learning that plants grow along the end of a body of water.
- **Success Criteria:** I can choose the friend that I think has the best idea about where plants live and grow. I can make initial explanations by observing plants growing along the end of a body of water.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Places Plants Grow.* This is intended to serve as a pre-assessment and uncover students' basic ideas about places plants grow and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *plants growing along the edge of a body of water* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Landscape Architect* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *Where do different kinds of plants grow?*

Lesson 2: Day 3 - Places Plants Grow - Explore

- **Learning Intention:** I am learning that different types of plants grow in different environments.
- **Success Criteria:** I can observe where different types of plants grow in their environment by completing the Inquiry Activity, *Where Do Plants Grow?*
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Where Do Plants Grow?* They will make a prediction, carry out an investigation, record data and share their observations by answering questions from the teacher. Students will

Lesson 2: Day 4, 5, and 6 - Places Plants Grow - Explain

- **Learning Intention:** I am learning the differences between plants that grow in the desert and rainforest.
- **Success Criteria:** I can answer guided comprehension questions about the video, *Where do Plants Grow?* I can observe and compare the kinds of plants that live in a desert and rainforest by viewing various photographs.
- **Brief Overview of Lesson:** Students will revisit key vocabulary that they will see throughout this lesson and discuss the definitions. They will watch a video *Where Do Plants Grow?* and answer questions from the teacher. Students will complete an activity in the ***Science* notebook.** The teacher will use the Talk About It question to assess students' understanding of what they have learned so far. Students will explore the **Digital Interactive -** *Plants in Different Climates.* Students will complete the **Inquiry Activity -** *Desert or Rainforest Plants* by making a prediction, carrying out an investigation, recording data and sharing their observations with the class. Students will explore the **Digital Interactive -** *Match the Plant to the Climate.* Students will revisit the **Page Keeley Science Probe -** *Places Plants Grow* to change or justify their initial response.

Lesson 2: Day 7 - Places Plants Grow- Elaborate

- **Learning Intention:** I am learning that bean plants grow best based on the amount of sunlight they get.
- **Success Criteria:** I can determine where bean plants grow best by placing them in three different locations: a warm sunny place, shady place and dark place.
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Perky Plants.* They will make a prediction, carry out an investigation and record data to determine where bean plants grow best. The teacher will lead a **Talk About It** by asking questions about student observations.

Lesson 2: Day 8 and 9 - Places Plants Grow - Evaluate

- **Learning Intention:** I am learning that plants from various places and how the plant parts help them live and grow.
- **Success Criteria:** I can create a plant that will live in a specific climate by drawing a picture and labeling its parts.
- **Brief Overview of Lesson:** Students will complete the **Performance Task -** *Perfect Plant*. Students will draw a plant that has parts that enable it to survive in its environment. Students will revisit the **Essential Question -** *Where do different kinds of plants grow?* Students will complete the Lesson 2 assessment.

Lesson 3: Places Animals Live

Lesson 3: Day 1 and 2 - Places Animals Live - Assess and Engage

- **Learning Intention:** I am learning where animals live.
- **Success Criteria:** I can choose the friend that I think has the best idea about where animals live by completing the Page Keeley Science Probe. I can make initial explanations by observing a deer eating from a bush in a forest.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Places Where Animals Live.* This is intended to serve as a pre-assessment and uncover students' basic ideas about places animals live and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a deer eating from a bush in a forest* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of an *Animal Trainer* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *Where do different kinds of animals live?*

Lesson 3: Day 3 and 4 - Places Animals Live - Explore

- **Learning Intention:** I am learning about appropriate shelters for different animals.
- **Success Criteria:** I can complete the Inquiry Activity, *Animal Homes* by choosing an animal from a set of replicas and use different materials to build it a home. I can answer questions about the text, *Iggy Iguana.*
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Animal Homes*. During the activity, students will draw and build an appropriate home or shelter for their animal. Students will share and discuss their animal homes with other groups. The teacher will read the **Science Paired Read Aloud -** *Iggy Iguana.* Students will answer questions about the story and share with classmates.

Lesson 3: Day 5, 6, and 7 - Places Animals Live - Explain

- **Learning Intention:** I am learning the differences between animals living in the rainforest and in the desert.
- **Success Criteria:** I can discuss whole-group or with a partner about what I learned by watching the video *Where Do Animals Live*. I can make additions to my mural of the rainforest and the desert by adding an animal to one of the habitats.
- **Brief Overview of Lesson:** Students will revisit key vocabulary that they will see throughout this lesson and discuss the definitions. The teacher will read the **Science Paired Read Aloud -** *Animal and Plant Habitats* and answer questions about the text. They will watch a video *Where Do*

Animals Live? and answer questions from the teacher. Students will complete an activity in the ***Science*** **notebook.** The teacher will use the Talk About It question to assess students' understanding of what they have learned so far. Students will complete the **Inquiry Activity -** *Rainforest and Desert Animals.* Students will carry out an investigation and record data during the activity, and then they will answer questions about what they observed. Students will revisit the **Page Keeley Science Probe -** *Places Where Animals Live* to change or justify their initial response.

Lesson 3: Day 8 - Places Animals Live - Elaborate

- **Learning Intention:** I am learning what humans need to survive.
- **Success Criteria:** I can investigate what humans need to survive by completing the Inquiry Activity, *Things Humans Need*.
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Things Humans Need.* Students will draw a picture that shows what humans need to survive, such as food, air, water, and shelter. The teacher will use a **Talk About It** question to assess student understanding of the activity.

Lesson 3: Day 9 and 10 - Places Animals Live - Evaluate

- **Learning Intention:** I am learning that animals live in places that will provide the resources they need for survival.
- **Success Criteria:** I can show an understanding of what they have learned about places animals live by making a habitat model.
- **Brief Overview of Lesson:** Students will complete the **Performance Task -** *Habitat Model*. Students will draw the habitat model and glue pictures of animals to the model. Students will revisit the **Essential Question -** *Where do different kinds of animals live?* Students will complete the Lesson 3 assessment.

Lesson 3: Day 11 and 12 - Plants and Animals Module Performance Project

- **Learning Intention:** I am learning that plants and animals live together in an environment and often help each other survive.
- **Success Criteria:** I can show how animals and plants live together in an environment by constructing a diorama.
- **Brief Overview of Lesson:** Students will complete the **Performance Project -** *Make a Diorama.* Students will design and build play areas that show where and how plants and animals live together. Students should use arrows and labels to show how plants and animals depend on each other. Students will define a problem, make a model and draw their observations. The teacher will lead a class discussion with a **Talk About It** question. Finally, students will complete the **Plants and Animals Module** assessment.

CULTURALLY RESPONSIVE TEACHING in PRACTICE	SOCIAL EMOTIONAL LEARNING in PRACTICE

• Search for famous scientists in the field of "Plants and Animals"
• Search for current events related to plants and animals
• Try to find examples of a Veterinarian, Park Ranger, Landscape Architect, and Animal Trainer from different cultures
	• Responsible Decision-Making
	  ○ Making ethical, constructive choices about personal and social behavior
	• Relationship Skills
	  ○ Forming positive relationships, working in teams, dealing effectively with conflict

Lesson 1:	Plant and Animal Needs	Estimated Time: 12 days (45 minutes per day)

Brief Overview of Lesson:

- **Day 1:** Students will be introduced to the Module Phenomenon of *a camel in the desert* by watching a video. Students will think of questions about how the camel might get what it needs to survive in its environment. The teacher will ask questions about the video to lead a class discussion. Students will be introduced to the vocabulary words that they will see throughout the module. Students will learn about the **STEM Career Kid Connection -** *Veterinarian* and answer questions about the career.

- **Day 2 and 3:** Students will complete the **Page Keeley Science Probe -** *Plant and Animal Needs.* This is intended to serve as a pre-assessment and uncover students' basic ideas about the needs of plants and animals and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a chipmunk eating a nut in its natural habitat* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Park Ranger* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *What do plants and animals need to live?*
- **Day 4, 5, and 6:** Students will complete the **Inquiry Activity -** *Plant and Animal Needs*. Students will observe two plants, one left in sunlight and the other left in the dark, and compare the changes that occur over several days. Students will make a prediction, carry out an investigation, record their observations, and discuss the investigation with their classmates. The teacher will read the **Science Paired Read Aloud**, *Growing Up* and answer questions about the story. The teacher will wrap-up the lesson asking a **Quick Check** question to assess student understanding.
- **Days 7, 8 and 9:** Students will revisit the vocabulary words for this lesson and learn their definitions. The teacher will read the **Science Paired Read Aloud**, *Plant and Animal Needs* and answer questions. Students will complete the **Digital Interactive -** *Rabbit Health*. Students will complete the **Inquiry Activity -** *Picture Cards*, making a prediction, carrying out an investigation and recording their observations. Finally, students will revisit the **Page Keeley Science Probe** to either change or justify their initial responses.
- **Day 10:** Students will explore the **Digital Interactive -** *What Animals Eat* to learn about carnivores, herbivores, and omnivores. The teacher will ask questions about the activity and students will make a model of their chosen animal. Students will explain to a partner how what their animal eats helps it to grow and survive.
- **Day 11 and 12:** Students will complete the **Performance Task -** *Create a Survival Graph* where they will compare the needs of plants and animals to the needs of people. Students will make a model by drawing a plant or animal and all of its needs on one side of a poster; and by drawing all of the things that they (the students) need for survival on the other side of the paper. The teacher will lead a **Talk About It**, asking students to compare their needs to those of different plants and animals. Students will revisit the **Essential Question** and take the Lesson 1 assessment.

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

- Living things can grow, change, and reproduce. For living things such as plants and animals to grow and change, they need water, air, food, and space to grow. Animals also need shelter, and plants also need light. Different living things need different kinds of air and food. Plants use water, carbon dioxide from the air, and energy from light to make food in their leaves through a process called photosynthesis. Animals must find food to eat. Different types of animals need to eat different kinds of food in order to survive. For example, carnivores are animals that eat only meat. Herbivores only eat plants, and omnivores eat both plants and animals for food. One way to find out what a plant or animal needs is to observe its habitat, which will provide evidence about what the plant or animal needs.

LESSON FOUNDATION	
Assessed Standards for this lesson	**Important content not included in the standards**
LS1.C: Organization for Matter and Energy Flow in Organisms • All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1)	• Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. • Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.
Focus Question for this Lesson	
What do plants and animals need to live?	

Learning Intention	Success Criteria
I am learning the needs of plants and animals for survival.	*I can use evidence to explain what plants and animals need to live.*

Assessment(s)

- Page Keeley Science Probe - Plant and Animal Needs (Lesson 1)
- Performance Task - Create a Survival Graph (Lesson 1)
- Plants and Animals Lesson 1 Test

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

- Rubrics
- Student self-regulation or self-monitoring
- Peer Evaluation
- Lesson Trackers
- Aggressive Monitoring
- Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Some students may think that plants do not breathe or need air. Air is a gas. Plants do need air, but they need a different gas than animals. Animals need oxygen to live, and plants need carbon dioxide. Both gases are found in air. Some students may think that all plants and animals need the same things in order to survive. Students may not understand the connection between habitat and needs. Tell students that a habitat is a place where plants and animals live and that a habitat has everything that a plant or an animal needs. Plants and animals cannot survive in a habitat that does not meet their needs. Clarify that some basic needs may be similar but that a habitat can provide evidence of what a plant or animal needs based on how it is surviving in the habitat.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

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.
Plan for tiered learning

THE LESSON IN ACTION: Lesson 1, Day 1 - Module Opener

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

Lesson Opening

Do Now:

- **ASK:**
  - What is the difference between a *want* and a *need*?

During the Lesson

Module Opener:

- Introduce the module phenomenon by showing the video of the camel in a desert. Ask students to think of questions they have relating to how the camel might get what it needs to survive in its environment.
- **ASK:**
  - What do you see in the video? *(Sample answer: I see a camel. There is sand and some plants.)*
  - How do you think the camel gets its food? *(Sample answer: The camel might eat some of the plants.)*
  - What else do you think the camel needs to survive? *(Sample answer: The camel needs water.)*
- Read the question on page 98 in the **Science Notebook**. Direct students to think about where the camel gets what it needs. Accept all answers that suggest a camel gets what it needs from the place where it lives
- **Introduce Key Vocabulary**:
  - animal, Arctic, climate, desert, ecosystem, forest, habitat, living, need, nonliving, plant and survival
  - Display the teacher presentation slide, and read the Key Vocabulary that students will learn in this module.These words are a selection of important vocabulary that will be used throughout the module. Tell students to listen for these Key Vocabulary words as they complete the module.

STEM Career Kid Connection: Veterinarian

- Display the teacher presentation slide and introduce Career Kid Ruby, who wants to be a veterinarian when she grows up.
  - Veterinarians help keep animals healthy. They treat sick animals and help them get better. Veterinarians need to know what animals need to grow and survive.
- Re-read to students what Ruby says in the **Science Notebook.**
- **ASK:**
  - Why does a veterinarian need to know what animals need to live? *(Sample answer: to help them get better when they are sick)*
  - How can Ruby use what she knows about animals to help her with her problem? *(Sample answer: She can make sure the animals get what they need in the new area.)*

Lesson Closing

Science and Engineering Practices:

- **I will** *analyze data.*
- **I will** *interpret data.*
- **I will** *develop a model.*
- **I will** *use a model.*

- With students, read the "I will . . ." statement in the **Science Notebook**. The "I will . . ." statements listed above reference Science and Engineering Practices that will be covered throughout the lessons in this module.
- If this is the first time you are teaching these science and engineering practices, then tell students that they can make models by drawing or using building materials to show something in the real world. A model can be a smaller version of a big thing or a larger version of a small thing. They can use models to see how plants and animals live in the real world.

THE LESSON IN ACTION: Lesson 1, Day 2 and 3 - Assess and Engage

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

Lesson Opening

Do Now:

- **ASK:**
  - What does the camel need for survival?

During the Lesson

Assess Lesson Readiness- Page Keeley Science Probe: Plant and Animal Needs

- This probe can be used as an elicitation prior to introducing a lesson on the needs of plants and animals.
  - 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 used as a worksheet in which students circle their answers, be projected or used on an easel chart, or each of the answer choices can be printed on cards and used as a card sort.
- Start by pointing to each of the answer choices and asking children what they know about each of the things on the list. It may help to define nutrients and shelter for students.
- Make sure to emphasize that the probe is about all plants and animals.
  - Some plants or animals may not need some of the things on the list, but encourage students to think more broadly about whether each thing on the list is a need of all plants and all animals.
  - 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 needed by both plants and animals. Use talk moves to help them explain their thinking about plant and animal needs.
  - Listen carefully as students explain their thinking.

Science in My World- Phenomenon:

- Play the video, and ask students what questions they have about the chipmunk. Record their questions on the board to revisit at the end of the lesson. 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 was the chipmunk doing?
  - What did you wonder about when you saw the video?
  - Have you seen something like this before?
  - What about the chipmunk is interesting to you?
- 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: Park Ranger

- Introduce Career Kid Poppy, who wants to be a park ranger when she grows up.
    - A park ranger is interested in learning about how plants and animals live together.
- Read to students what Poppy says in the speech bubble in the **Science Notebook**.
- **ASK:**
    - Why would a park ranger be interested in what an animal such as a chipmunk eats? *(Sample answer: The park ranger would know more about how to care for an animal if he or she knows what the animal eats.)*
    - What other things about animals do you think a park ranger would like to know about? *(Sample answers: A park ranger might be interested in where animals live, such as on land or in water. A park ranger may also want to know if animals like to live in a sunny place or a dark place such as a cave.)*
- Tell students that park rangers work in many national or state parks all over the country. Park rangers make sure that the plants and animals in a park are well cared for and not disturbed by the people who come to visit the park.
    - Tell students that this is important because the plants and animals depend on each other to live and grow. Watch the video about Poppy with students.

Essential Question: What do plants and animals need to live?

- Have students follow along as you read the **Essential Question**.
    - Have them use prior knowledge and observations to try to answer the question and complete the drawing activity on page 100.
    - 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.
- Record students' answers, as well as their thoughts and questions about the **Essential Question**, on chart paper or the board so that you can reference them throughout the lesson.

Lesson Closing

Science and Engineering Practices:

- **I will** *analyze data.*
- **I will** *interpret data*.
- Have students follow along as you read the "I will . . ." statements in the **Science Notebook**.
    - Throughout the lesson, students will learn about what plants and animals need to live and grow. They will record data and analyze it as they investigate whether plants need sunlight to grow.
- If this is the first time you are teaching the Science and Engineering Practices of analyzing and interpreting data, explain that scientists gather data or information. Then they study the data to answer a science question.
- **ASK:**
    - What kind of data might you collect from an investigation about whether plants need sunlight to grow? *(Sample answer: how much a plant grew)*

THE LESSON IN ACTION: Lesson 1, Day 4, 5, and 6 - Explore

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

Lesson Opening

Do Now:

- **ASK:**

- What does a Park Ranger do?

During the Lesson

Inquiry Activity: Plant and Animal Needs

- Students will investigate if a plant needs sunlight to grow.
  - They will give each of two plants the same amount of water as needed.
  - They will observe how the plants grow and change over the course of several days.
  - Students should discover that the plant that is kept in a dark place will not grow as well as the plant that is kept in a sunny place.

Advanced Preparation:

- Prior to the activity, obtain several of the same kinds of plant seedlings, such as bean plants. Plants should all be of similar size and shape. Or you may plant several bean seeds in foam or paper cups, allowing them to germinate into seedlings. Point out that students just saw a video of a chipmunk and learned what the chipmunk needs to live. Now they will discover what a plant needs to live.

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.
- Have students follow along as you read the **Make a Prediction** activity in the **Science Notebook**.
- Have students circle their answers. Then have students explain their predictions based on previous observations.

Carry Out an Investigation:

- Read the steps of the investigation on the teacher presentation slide together with students.
- Explain to students that they will investigate if a plant needs sunlight in order to grow and survive.
- Give each group two plants, and have them talk about how the plants are similar. Plants should both be about the same height.
- Students will place one plant in a sunny location, such as a windowsill. They will place the second plant in a very dark location, such as a closet.
  - Have students give each plant the same amount of water.
  - Students will observe the plants each day for several days.
  - Have students water plants as needed when the soil is dry, making sure that each plant receives the same amount of water.

Talk About It:

- Encourage students to observe the plants each day and sketch them on a separate sheet of paper. Discuss their observations and ideas about the investigation with the help of the following discussion questions.
- **ASK:**
  - Do you observe any changes in the plants? If so, describe them. *(Sample answer: I can see that the plant in the dark is beginning to droop but that the plant in the sun is growing a new leaf.)*
  - Why is it important to give each plant the same amount of water? *(Sample answer: If we gave the plants different amounts of water, we would not know if the changes we see were because of light or because of water.)*

Growing Up Read Aloud:

- Read the fiction selection Growing Up in the Science Paired Read Aloud. Flip through the pages, and have students examine the illustrations. Ask students to make predictions about the main characters and important details of the story from the illustrations. Read the selection aloud. Stop on pages with lesson vocabulary, and make sure students understand the meaning of the words used in the story. Once you have finished the selection, you can use close-reading strategies by asking students to identify which page best tells what types of food a spider monkey eats and why students think the author included the baby spider monkey in the story. In addition, use the following questions to ensure students understand the content of this lesson.
- **ASK**:

- Is Miles a living thing? Explain. *(Sample answer: Yes, he is growing and changing as he gets older.)*
- According to Aunt Mana, what do living things do? *(Sample answer: Living things grow and change as they get older. They need food and water to live and grow.)*
- Are plants living things? Explain. *(Sample answer: Yes, they grow and change and need food and water.)*

Carry Out an Investigation, Record Data:

- After several days have elapsed, have students draw a picture of each plant in their **Science Notebook**.
  - This drawing should be of the final state of each plant.
- **Math Connection**
  - Have students use cube trains to measure the height of each plant.
  - Have students lay their cube trains next to one another and compare the heights to see which one is taller.
  - Have them draw the cubes on their drawings of the plants in the **Science Notebook**.
- **ASK:**
  - How many cubes did you use for each plant? *(Answers will vary.)*

Lesson Closing

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 that plants need sunlight to live, have them revisit some activities in this lesson.
- **ASK:**
  - Compare the two plants. Why are they different? What pattern do you notice? *(Sample answer: The plant that had sunlight grew taller than the plant in the dark.)*

THE LESSON IN ACTION: Lesson 1, Day 7, 8, and 9 - Explain

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

Lesson Opening

Do Now:

- **ASK:**
  - How were your two plants different? What patterns did you notice?

During the Lesson

Obtain and Communicate Information: Vocabulary:

- Read aloud the vocabulary words listed. Have students circle vocabulary words that they have heard before. Using the teacher presentation slide, display the words and read aloud their definitions.
  - You may add the words to a word wall so you can reference them throughout the lesson. Explain to students that they will see the words used in the content that they will be learning.
  - **animal**- a living thing that is not a plant
  - **living**- something that grows and needs food, air, and water to survive
  - **need**- something you must have in order to live
  - **nonliving**- thing that does not grow or need food, air, or water

- **nutrient**- a thing that living things need to grow
- **plant**- a living thing that has leaves and roots and makes its own food
- **shelter**- a place that gives protection from weather or danger
- **soil**- the top layer of Earth
- **survive**- to live and grow

Visual Kinesthetic Vocabulary:

- Have students cut out and fill in the Visual Kinesthetic Vocabulary on pages VKV223, VKV224, and VKV226 in the **Science Notebook**.
  - Read aloud the definitions for plant, animal, living, air, water, and soil. Write the words living and nonliving on the board.
  - Have students practice using the folded cards to make the word nonliving using the prefix non- and the card living.
  - Then ask students to give examples of living and nonliving things that they can think of in their neighborhood.
  - Write the lists on the board.
- Have students fill out the **Memory Maker** that asks them to draw a living thing and a nonliving thing.

Plant and Animal Needs Read Aloud:

- Read aloud the nonfiction selection *Plant and Animal Needs* in the **Science Paired Read Aloud**.
  - First, flip through the pictures and allow students to ask questions about what they see. Use the opportunity to share the definitions of the highlighted words in the text.
  - Then read the selection aloud.
  - Allow students to ask questions after each page to ensure they understand the content of the material.
- **ASK:**
  - What is an example of a living thing? *(Sample answer: a dog)*
  - What do animals need to survive? *(Sample answers: water, food, and air)*
  - Which part of the plant helps it stay in the ground? *(Sample answer: the roots)*

Talk About It:

- After completing the read aloud, have students talk with a partner about what they learned. Help them use two of the vocabulary words. Then review with students what only plants need to live, what only animals need to live, and what both plants and animals need to live.

Digital Interactive - Rabbit Health

- Have students explore the simulation Rabbit Health.
  - You may explore this simulation as a whole class or allow students to explore it with a classmate.
  - This simulation allows students to observe and choose things that an animal needs in its habitat.
- Use the following questions to ensure students understand that the simulation models a real-life scenario in the natural world.
- **ASK**:
  - What things did the rabbit need in its habitat? *(Sample answer: The rabbit needed the right food, water, and shelter.)*
  - What things did the rabbit not need in its habitat? *(Sample answer: The rabbit did not need a cupcake, soda, or an umbrella.)*

Record Data:

- Read aloud the instructions: Have students complete the circling activity.

Inquiry Activity - Picture Cards:

- Students will match a plant or animal card with something that will help it survive.

Advanced Preparation:

- Prior to the activity, prepare the picture cards. Make sure the vocabulary words for the lesson are represented on the cards and that there are enough "needs" cards to pair up with each plant or animal card. You can have multiple cards with needs on them such as the sun or water.

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. Have students follow along as you read the Make a Prediction in their **Science Notebook**.
- Have students circle their answers. Then have students explain their predictions based on previous observations.

Carry Out an Investigation:

- Give each student a card, and read the steps of the investigation on the teacher presentation slide together with students.

Talk About It:

- Use the Talk About It questions to assess students' understanding of what they have learned so far. If students do not demonstrate understanding about the needs of plants and animals, then have them revisit some activities in this lesson.
- **ASK:**
  - What does a plant or animal need to survive? *(Sample answer: An animal needs food and water. A plant needs soil, water, air, and sunlight.)*

Crosscutting Concepts- Systems and System Models:

- If this is the first time you have taught the Crosscutting Concept of systems and system models, help students understand that plants are part of the natural world and depend on their environment to survive. Students should recognize systems in the activities they have done in this lesson.
- **ASK**:
  - Why do some plants live in some places and not others? Can you give an example? *(Sample answer: Plants live in places where they can get all of their needs)*

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:**
  - How are the needs of plants and animals alike? How are they different? *(Sample answer: Both plants and animals need water, nutrients, air, and sunlight. Plants need soil to grow, and animals need shelter.)*

Complete the graphic organizer as a class. If students were not able to compare and contrast plant and animal needs, have them review their matching cards from the Picture Cards activity.

Reflect and Refine: Plant and Animal Needs

- 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 plant and animal needs. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

Lesson Closing

Science and Engineering Practices:

- **I can** *analyze data.*
- **I can** *interpret data.*

- Have the class say the "I can . . ." statements together. Then have students tell a partner what they can do. The "I can . . ." statements for this lesson reference the Science and Engineering Practices of analyzing and interpreting data.
- **ASK**:
  - What investigation did you do to learn about what plants need to survive? *(Sample answer: I put one plant in the dark and the other in the light and observed what happened.)*
  - What data did you analyze? *(Sample answer: I analyzed how the plants looked.)*

THE LESSON IN ACTION: Lesson 1, Day 10 - Elaborate

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

Lesson Opening

Do Now:

- **ASK:**
  - What investigation did you do to learn about what plants need to survive?

During the Lesson

Research, Investigate, and Communicate: **Inquiry Activity - What Animals Eat:**

- Students will determine what an animal eats. Then they will make a model to show what they learned.
  - Students will explore a digital interactive. Then they will draw an animal and a picture of what it eats.
  - They will identify whether the animal is a plant-eater, a meat-eater, or both plant- and meat-eater.
- Have students launch the **What Animals Eat** digital interactive to learn about carnivores, herbivores, and omnivores.
  - Students will sort the animals based on whether they are "meat-eaters," "plant-eaters," or "meat- and plant- eaters." Once students have explored **What Animals Eat**, use the following questions to check for student understanding.
- **ASK**:
  - How did this activity help you learn more about what animals eat? *(Sample answer: I learned that some animals eat only meat, some animals eat only plants, and some animals eat both meat and plants.)*
  - How would you describe your eating habits? *(Sample answer: I am a meat eater and a plant eater.)*

Make a Model:

- Read the directions on the teacher presentation slide to students.
  - Make sure students draw a representation of their chosen animal in their **Science Notebook.**
  - Read aloud all activity text on the page and ask students to circle the option that tells if their chosen animal is a plant-eater, a meat-eater, or a both plant- and meat-eater.

Lesson Closing

Talk About It:

- Have students explain to a partner how what their animal eats helps it to grow and survive.

THE LESSON IN ACTION: Lesson 1, Day 11 and 12 - Evaluate

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

Lesson Opening

Do Now:

- **ASK:**
  - How would you describe your eating habits?

During the Lesson

Performance Task- Create a Survival Graph:

- Students will compare the needs of plants and animals to the needs of people.
  - Students will choose a plant or animal they would like to care for.
  - They will construct a graph to show what the plant or animal needs to survive.
  - Then they will draw all the things they need to survive on the other side of the poster.
- Read the steps of the investigation together with students.
  - Help students choose a plant or animal they would like to care for.
  - Have students think about what things their plant or animal needs to survive.
  - Instruct students to draw their plant or animal on one half of the poster.
  - Instruct students to draw all the things their plant or animal needs.
  - Have students draw all the things they need to survive on the other half of the poster.

Make a Model:

- Circulate to help students with their drawings, if necessary. Then encourage students to compare and contrast the needs of plants and animals with their needs for survival.

Talk About It:

- In this activity, students explored the needs of plants and animals compared to people.
- **ASK**:
  - How did your graph compare to your classmates' graphs? *(Sample answer: The needs of people are the same as the ones my classmates drew. But the plants' and animals' needs were different.)*
  - How did this activity help you learn more about how the needs of plants and animals compare with your needs? *(Sample answer: I learned that I have the same needs as animals but different needs than plants.)*

Essential Question - What do plants and animals need to live?

- Have students watch the video. Then refer to their answers to the **Essential Question** in their Science **Notebook** that you recorded.
  - See if and how their thinking has changed. Discuss and share their answers as a class.
- Write a single sentence that captures the group's response on the board, and have students copy the class answer to the **Essential Question** in their **Science Notebook**.
  - Help students who may struggle with the writing task.
- Students will complete the **Lesson 1:** *Plants and Animal Needs* assessment

Lesson Closing

Science and Engineering Practices:

- **I did** *analyze data***.**
- **I did** *interpret data***.**
- Refer to the "I will . . ." and "I can . . ." statements in the **Science Notebook**.
- **ASK**:
  - Have you analyzed and interpreted data? If so, how? *(Sample answer: Yes, I drew pictures of plants. Then I compared them to see what plants need to grow.)*

- Read together as a class the "I did . . ." statements.

Lesson 1 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Lesson 2:	**Places Plants Grow**	**Estimated Time: 9 days (45 minutes per day)**

Brief Overview of Lesson:

- **Day 1 and 2:** Students will complete the **Page Keeley Science Probe - *Places Plants Grow.*** This is intended to serve as a pre-assessment and uncover students' basic ideas about places that plants grow and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *plants growing along the edge of a body of water* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Landscape Architect* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question - *Where do different kinds of plants grow?***
- **Day 3:** Students will complete the **Inquiry Activity - *Where Do Plants Grow?*** They will make a prediction, carry out an investigation, record data and share their observations by answering questions from the teacher.
- **Day 4, 5, and 6:** Students will revisit key vocabulary that they will see throughout this lesson and discuss the definitions. They will watch a video *Where Do Plants Grow?* and answer questions from the teacher. Students will complete an activity in the ***Science* Notebook.** The teacher will use the Talk About It question to assess students' understanding of what they have learned so far. Students will explore the **Digital Interactive - *Plants in Different Climates.*** Students will complete the **Inquiry Activity - *Desert or Rainforest Plants*** by making a prediction, carrying out an investigation, recording data and sharing their observations with the class. Students will explore the **Digital Interactive - *Match the Plant to the Climate.*** Students will revisit the **Page Keeley Science Probe - *Places Plants Grow*** to change or justify their initial response.
- **Day 7:** Students will complete the **Inquiry Activity - *Perky Plants.*** They will make a prediction, carry out an investigation and record data to determine where bean plants grow best. The teacher will lead a **Talk About It** by asking questions about student observations.
- **Day 8 and 9:** Students will complete the **Performance Task - *Perfect Plant*.** Students will draw a plant that has parts that enable it to survive in its environment. Students will revisit the **Essential Question - *Where do different kinds of plants grow?*** Students will complete the Lesson 2 assessment.

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

- Plants live in many different places on Earth. The types of plants and where they live vary with the climate and the plant's needs. Plants need certain amounts of light and water, a certain temperature range, nutrients, and air to grow. The differences among plants help them survive in different climates. Rainforest trees are very tall, as they reach up to expose their leaves to sunlight. Because it rains frequently, the roots of the trees do not need to go deep into the ground. Instead, the roots are exposed and form a wide base for the tree. Desert plants, such as cacti, have

shallow root systems that spread away from the plant over a large area. This helps them take in as much water as possible during infrequent periods of rain. Many cacti have a thick body, or stem, where they store water.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
ESS3.A: Natural Resources • Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)	• Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.

Focus Question for this Lesson

Where do different kinds of plants grow?

Learning Intention	**Success Criteria**
I am learning that plants need certain things to survive and how that determines where plants live.	*I can use evidence to show that plants live in places that have the things they need.*

Assessment(s)

- Page Keeley Science Probe - Places Plants Grow (Lesson 2)
- Performance Task - Perfect Plant (Lesson 2)
- Plants and Animals Lesson 2 Test

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

- Rubrics
- Student self-regulation or self-monitoring
- Peer Evaluation
- Lesson Trackers
- Aggressive Monitoring
- Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Some students may not understand that plants are different, depending on the climate in which they grow. Sometimes the same type of plant that grows in a different climate can have different appearances. For instance, an oak tree growing in a drier area may be shorter than one that grows in an area with regular rainfall. Students may also think that all plants need the same amount of water and light. Plants with large, dark, glossy leaves absorb heat. As a result, they require more water. Some plants thrive in low or indirect light. Others, such as the herb rosemary or the purple coneflower, thrive in full, direct light.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

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.
Plan for tiered learning

THE LESSON IN ACTION: Lesson 2, Day 1 and 2 - Assess and Engage

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

Lesson Opening

Do Now:

- **ASK:**
  - What kind of plants do you see where you live?

During the Lesson

Assess Lesson Readiness- Page Keeley Science Probe: Places Plants Grow

- Introduce the probe by telling students that two friends are talking about plants.
  - They each have different ideas about where plants live and grow.
- Point to each character in the probe, say the character's name, and read their claim.
  - Make sure students understand what each character is saying.
- Then ask the students to choose the friend they think has the best idea about where plants live and grow.
  - 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.
- Use their ideas to plan your instruction during the module that will address their misconceptions and help them gain new knowledge and use appropriate terminology related to plants and the habitats they live in.

Science in My World- Phenomenon:

- Show the photo, and ask students what questions they have about the plants. Record their questions to revisit at the end of the lesson. If students are having trouble generating their own questions, 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 do you see in the picture?
  - Have you seen something like this before? If so, where?
  - What about plants is interesting to you?
  - What did you wonder when you saw the photo?
- Help students turn their observations into questions that they can refer to during the lesson. Explain 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: Landscape Architect

- Introduce Career Kid Kayla, who wants to be a landscape architect when she grows up.
  - A landscape architect is interested in how plants grow and survive in different environments.
- Read to students what Kayla says in the speech bubble in the **Science Notebook**.
- **ASK**:
  - Why would a landscape architect be interested in how plants grow? *(Sample answer: The landscape architect would want to know what a plant needs to survive.)*

- What other things about plants do you think a landscape architect would like to know about? *(Sample answer: A landscape architect might be interested in where plants live, such as on land or in water. A landscape architect may also want to know if plants need a lot of water or if they survive best in sunny places or shady places.)*

- Tell students that landscape architects work to design and create scenery with different kinds of plants and flowers. Landscape architects know what kinds of plants will grow best in different kinds of soils. They also know which plants will grow best in different places, such as places that are hot year round or have different seasons. Watch the video about Kayla with students.

Essential Question: Where do different kinds of plants grow?

- Have students follow along as you read the **Essential Question.**
  - Have them use prior knowledge and observations to try to answer the question.
- Have them draw their ideas in their science notebook.
  - 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.
- Record students' thoughts and questions about the **Essential Question** by using chart paper or the board so they can reference them throughout the lesson.

Lesson Closing

Science and Engineering Practices:

- **I will** *develop a model.*
- **I will** *use a model.*
- Have students follow along as you read the "I will . . ." statements.
  - Throughout the lesson, students will learn about places that plants grow.
  - They will observe bean plants in different conditions.
  - If this is the first time you are teaching the Science and Engineering Practice of developing and using models, explain that scientists develop a model, or a copy, of something to study how it works. Models can be smaller or larger than the object a scientist studies.
- **ASK**:
  - What kind of model might you make with plants? (Sample answer: a model of a pond or river with plants in it)

THE LESSON IN ACTION: Lesson 2, Day 3 - Explore

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

Lesson Opening

Do Now:

- **ASK:**
  - What is the career of a Landscape Architect like?

During the Lesson

Inquiry Activity: Where Do Plants Grow?

- Students will observe where different types of plants grow in their environment.
- Students should draw to tell about where they found plants on their walk around the school.

Advanced Preparation:

- Identify a few areas in and around the school that feature several types of plants for students to find. If needed, set up some plant areas prior to class.

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.
- Have students follow along as you read the Make a Prediction activity in the **Science Notebook**. Have students circle their answers. Then have students explain their predictions based on previous observations.

Carry Out an Investigation:

- Read the directions for the investigation on the teacher presentation slide together with students.
- Explain to students that they will begin by searching for plants in the school neighborhood.
  - Tell students that they will be going outside and that they should use their eyes, or their sense of sight, to look for the different places they find plants growing.
  - They should also observe the different kinds of plants that grow in the neighborhood.
  - While you are outside, guide students to look for both wild and cultivated plants.
  - While you are walking, ask students to think about how the plants might get the water they need.
- **If going outside to look for plants is not realistic, the teacher can use photos and/or videos to show various plants from the area

Record Data:

- Once you return to the classroom, discuss with students what they observed.
- Read aloud the instructions and have students complete the activity.
- Students should draw the plants and locations of the different plants they saw on their walk.
- Ask students to share their plants and locations with a classmate.
- Once students have finished their drawings, ask for volunteers to show their drawings to the class.

Lesson Closing

Talk About It :

- Have students share their observations with the help of the following discussion questions.
- **ASK**:
  - Where did you find each plant? *(Sample answers: My pictures show plants in a garden and along the playground and the sidewalk. I saw plants growing out of a gutter alongside the road. I saw plants growing from cracks in the sidewalk.)*
  - How do you think the plant was able to grow there? *(Sample answers: I think the garden plants may get water from a hose or sprinkler. The plants along the playground and sidewalk were watered by rain. The plants in the gutter along the road grow where rainwater flows and collects.)*
  - Do you think there were any places along the walk that were not good places for plants to grow? *(Sample answer: Yes, plants are not able to grow on a playground, on a sidewalk, or on a road. They did not grow in dark places.)*
  - Why were plants found in a good growing location? *(Sample answer: The plants grew because they got lots of sunlight and water.)*

THE LESSON IN ACTION: Lesson 2, Day 4, 5, and 6 - Explain

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

Lesson Opening

Do Now:

- **ASK:**
  - How does the environment impact different types of plants growing there?

During the Lesson

Obtain and Communicate Information: *Vocabulary*

- Read aloud the vocabulary words listed. Have students circle vocabulary words that they have heard before. Using the teacher presentation slide, display the words and read aloud their definitions.
  - You may add the words to a word wall so you can reference them throughout the lesson.
- Explain to students that they will see the words used in the content that they will be learning.
  - **Arctic**- a very cold place near the North Pole
  - **desert**- a dry place forest a place where there are many tall trees
  - **pond** -a small body of freshwater
  - **climate**- the usual rain and temperature in a place

Where Do Plants Grow? video:

- Have students watch the video *Where Do Plants Grow?* Use the following questions to discuss what students learned and to check that they understand concepts from the video.
  - How do desert cacti store water? (*Sample answer: They have shallow and widespread roots that collect water, and they store water in their stems.)*
  - Why do Arctic plants have dark colors on their leaves? *(Sample answer: to better absorb sunlight)*
  - Water lilies are attached underwater to the ground at the bottom of where they live. How do water lilies help the environment? *(Sample answer: They provide a place where fish, frogs, and turtles can hide.)*
- Then read aloud the activity and help students complete the activity.

Develop Vocabulary:

- **Arctic; desert; forest**
- Write the words on the board. Provide students with the words printed on strips of paper. Have students cut the words in half, helping them if necessary, and mix up the cards. Help students practice sounding out each three-letter section. Then have them match up the word cards and sound out each word. Have students glue the words to paper and add pictures. For example, they may draw a snowman or mittens for the word *Arctic.*

Digital Interactive: Plants in Different Climates

- Have students launch the digital interactive to learn about where different plants live. Introduce the interactive by telling students that a climate is the usual weather in an area over many years. Weather is day-to-day. Once students have explored *Plants in Different Climates*, use these questions to check understanding.
- **ASK**:
  - What was the same and different about the plants? *(Sample answers: All the plants had leaves. They were different colors and sizes.)*
  - How are the climates different from one another? *(Sample answers: Some climates are very hot. Others are very cold. Some climates have a lot of rain. Some have very little rain)*
- The teacher will read aloud the activity and help students complete the activity.

Inquiry Activity - Desert or Rainforest Plants:

- Students will identify desert and rainforest plants.

Advanced Preparation:

- Prior to the activity, prepare the environment pictures and the plant picture cards. Choose a variety of desert and rainforest plants.

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.
- Have students follow along as you read the **Make a Prediction** activity.
- Have students circle their predictions. Then have students explain their predictions based on previous observations.

Carry Out an Investigation:

- Display a picture of a rainforest and a picture of a desert. Have students observe the plants in the pictures carefully. Allow students time to compare the kinds of plants that live in each environment. Students should note the differences in the number of leaves and flowers that appear on each of the plants. Provide groups with pictures of desert and rainforest plants. Have students sort the pictures into two piles by environment.

Record Data:

- Read aloud the instructions. Have students record their data. Place two pieces of mural paper or poster board on one of the classroom walls. Label one "Desert" and the other one "Rainforest." Ask students to "plant" their pictures on the correct mural. Leave the murals up so students can add to the two different ecosystems later in the module.

Talk About It:

- Have students share their observations with the help of the following discussion question.
- **ASK:**
    - How are your plants alike and different? *(Sample answer: Answers will vary)*

Match the Plant to the Climate Digital Interactive:

- Have students launch the *Match the Plant to the Climate* **Digital Interactive**. Explain to students that they will be exploring different climates and will have the chance to examine different plants and decide where they live. Explain to students that they will match each plant to its home. You can place students into small groups or use the interactive as a demonstration for the whole group.
- Once students have completed the interactive, read aloud the activity instructions. Students will trace the word "desert" to complete the activity. Encourage students to think about what they learned about the places plants live when they matched plants to their climates.

Talk About It:

- Use the **Talk About It** questions to assess students' understanding of what they have learned so far. If students do not demonstrate understanding about the difference between desert and rainforest plants, have them revisit some activities in this lesson.
- **ASK**: How are desert and rainforest plants different? *(Sample answer: The desert plants have small leaves and not very many flowers. The rainforest plants have big leaves and lots of leaves and flowers.)*
- How are desert and rainforest plants alike? *(Sample answers: They both can have flowers. They can both grow where it is warm.)*

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
- **ASK:**
    - Where are some places that plants can live? *(Sample answer: Plants can live in very dry places such as a desert or very cold places such as the Arctic. They can live in rainy places such as a tropical rainforest, or in a forest where there are very tall trees.)*

- Complete the graphic organizer as a class. If students were not able to compare and contrast plant and animal needs, have them review the video, *Where Do Plants Grow?*

Reflect and Refine: Places Plants Grow

- 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 places plants grow. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

Lesson Closing

Science and Engineering Practices:

- **I can** *develop a model.*
- **I can** *use a model.*
- Read aloud the text- Have the class say the "I can . . ." statements together. Then have students tell a partner what they can do. The "I can . . ." statements for this lesson reference the Science and Engineering Practices of developing and using models.
- **ASK:**
  - What did you do to make a model that shows where plants live? *(Sample answer: I drew a picture of plants that live around the school. I drew a picture of a plant that lives in a desert and in a rainforest.)*
  - What did you learn from your model? *(Sample answer: I learned that plants grow in many different places.)*

THE LESSON IN ACTION: Lesson 2, Day 7 - Elaborate

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

Lesson Opening

Do Now:

- **ASK:**
  - What are some places that plants can live?

During the Lesson

Research, Investigate, and Communicate:

Inquiry Activity- Perky Plants:

- Students will determine where bean plants grow best. Students will place 3 bean plants in different locations. They should observe that the plant in the sunny, warm place will grow best.

Advanced Preparation: (Optional)

- Prior to the activity, plant bean seeds in foam or paper cups, and allow them to germinate side by side, all in the same environment. Prepare enough cups so each group has 3 bean plants. Label the cups 1, 2, and 3 for each group.

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.
- Have students follow along as you read the Make a Prediction activity. Have students circle their answers.
- Then have students explain their prediction based on previous observations.

Carry Out an Investigation:

- Read the steps of the investigation on the teacher presentation slide with students. Give each group 3 bean plants, and have them place the bean plants in three different locations. Students may choose a warm, sunny place such as on a windowsill, a dark place such as a closet, and a shady place such as under a table. Allow students to observe the plants each day for 5 days.
    - Assist students as they put soil in the cups. Direct them to use the spoon, not their hands.
    - Tell students to plant one bean seed in each cup.
    - Assist students with watering the beans.
    - Direct students around the room, placing one cup in the sun, one cup in the shade, and one cup in a dark place (such as a cabinet).
    - Explain to students that they will observe the seeds for five days.

Record Data:

- Read aloud the instructions.
- Make sure students draw a representation of each bean plant in their science notebook.
    - Remind them to look at the number on each cup and draw the plant in the appropriate box in the data chart.
- Have students discuss how the plants are alike and different.

Lesson Closing

Talk About It:

- Have students share their observations and data with their classmates.
- **ASK:**
    - Where did the bean seeds grow best? Why do you think so? *(Sample answer: The bean seeds grew best in the warm, sunny spot because the plant got all of its needs.)*
    - Where did the bean plants not survive very well? Why do you think so? *(Sample answers: The bean plants did not do well in the dark because they did not get sunshine. They did not do well in the refrigerator because there was no sunshine and it was too cold for them to survive.)*

THE LESSON IN ACTION: Lesson 2, Day 8 and 9 - Evaluate

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

Lesson Opening

Do Now:

- **ASK:**
    - Which environment did the bean seed grow best?

During the Lesson

Performance Task - Perfect Plant:

- Students will create a plant that will live in a specific climate by drawing a picture and labeling its parts. Students should draw a plant that has parts that enable it to survive in its environment.

Make a Model:

- Read the steps of the activity together with students.

- Assign each group of students a climate that they have learned about: desert, Arctic, or rainforest. Circulate around the room, and help students with their drawings, if necessary. Help students add labels for each plant part. Then encourage students to compare and contrast the needs of plants in the various climates and how the plant parts help it live and grow.

Crosscutting Concepts - Systems and System Models:

- If this is the first time you have taught the Crosscutting Concept of systems and models, help students understand that plants can be described in terms of their parts and that systems in the natural world have parts that work together.
- **ASK**:
  - Why do some plants grow well in some places and not others? *(Sample answers: Plants grow well in some places because they get what they need to live, such as sunlight, air, and water. Some plants can grow well in places such as deserts because they have special parts that store water. Or they can live in cold places such as the Arctic because they have dark leaves that absorb warmth from the sun.)*
- **Talk About It:**
  - In this activity, students explored plants from various places and how the plant parts help them live and grow.
- **ASK**:
  - How did your model compare to your classmates' models? *(Sample answer: My model was like my classmates' models because it showed a plant that could live well in its climate.)*
  - How did this activity help you learn more about where plants can grow well? *(Sample answer: I learned that plants can grow in different climates because they have special parts that help them get what they need to survive.)*

Essential Question - Where do different kinds of plants grow?

- Have students look at the photo, and refer back to this question in the **Science Notebook** and the answers you recorded.
- Ask them if and how their thinking has changed. Discuss and share their answers as a class.
- Write a single sentence that captures the group's response on the board, and have students copy the class answer to the **Essential Question** on in the **Science Notebook**. Help students who may struggle with the writing task.

Assessment

- Students will complete the **Lesson 2:** *Places Plants Grow* assessment.

Lesson Closing

Science and Engineering Practices:

- **I did** *develop a model***.**
- **I did** *use a model***.**
- Refer back to the "I will . . ." and "I can . . ." statements.
- **ASK**:
  - Have you developed and used models? If so, how? (Sample answer: Yes, I modeled where plants live to show how plants that live in different places are different.)
- Read together as a class the "I did . . ." statements.

Lesson 2 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science

- Discovery Education Website
  - Mystery Science
  - Generation Genius

Lesson 3:	Places Animals Live	Estimated Time: 12 days (45 minutes per day)

Brief Overview of Lesson:

- **Day 1 and 2:** Students will complete the **Page Keeley Science Probe -** *Places Where Animals Live.* This is intended to serve as a pre-assessment and uncover students' basic ideas about places that animals live and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a deer eating from a bush in a forest* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of an *Animal Trainer* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *Where do different kinds of animals live?*
- **Day 3 and 4: Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Animal Homes*. During the activity, students will draw and build an appropriate home or shelter for their animal. Students will share and discuss their animal homes with other groups. The teacher will read the **Science Paired Read Aloud -** *Iggy Iguana.* Students will answer questions about the story and share with classmates.
- **Day 5, 6, and 7:** Students will revisit key vocabulary that they will see throughout this lesson and discuss the definitions. The teacher will read the **Science Paired Read Aloud -** *Animal and Plant Habitats* and answer questions about the text. They will watch a video *Where Do Animals Live?* and answer questions from the teacher. Students will complete an activity in the ***Science*** **notebook.** The teacher will use the Talk About It question to assess students' understanding of what they have learned so far. Students will complete the **Inquiry Activity -** *Rainforest and Desert Animals.* Students will carry out an investigation and record data during the activity, and then they will answer questions about what they observed. Students will revisit the **Page Keeley Science Probe -** *Places Where Animals Live* to change or justify their initial response.
- **Day 8:** Students will complete the **Inquiry Activity -** *Things Humans Need.* Students will draw a picture that shows what humans need to survive, such as food, air, water, and shelter. The teacher will use a **Talk About It** question to assess student understanding of the activity.
- **Day 9 and 10:** Students will complete the **Performance Task -** *Habitat Model*. Students will draw the habitat model and glue pictures of animals to the model. Students will revisit the **Essential Question -** *Where do different kinds of animals live?* Students will complete the Lesson 3 assessment.
- **Day 11 and 12:** Students will complete the **Performance Project -** *Make a Diorama.* Students will design and build play areas that show where and how plants and animals live together. Students should use arrows and labels to show how plants and animals depend on each other. Students will define a problem, make a model and draw their observations. The teacher will lead a class discussion with a **Talk About It** question. Finally, students will complete the **Plants and Animals Module** assessment.

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

- Different animals live in different places. Animals need basic things such as food, water, air, and shelter. But they may need different amounts of water or different types of food or shelter. The place an animal lives that provides these necessities is called a habitat. A habitat offers the kind of climate, shelter, food, and water source that an animal that lives there needs. For example, some parrots fly from tree to tree in a rainforest habitat where they find the leaves, nuts, berries, and fruit they need to live. An environment is all of the things that surround an organism and is made up

of a larger area than a habitat. An environment may have many different habitats. An ecosystem is made up of all of the living things and nonliving things in an environment interacting. An ecosystem can be large, such as an ocean or a continent, or small, such as a puddle.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
ESS3.A: Natural Resources • Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)	• Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.

Focus Question for this Lesson

Where do different kinds of animals live?

Learning Intention	**Success Criteria**
I am learning why animals live in places that have the things they need.	*I can develop a model to show that animals live in places that have the things they need.*

Assessment(s)

- Page Keeley Science Probe - Forecast (Lesson 3)
- Performance Task - Make a Video (Lesson 3)
- Weather Lesson 3 Test
- Weather Module Performance Project - Make a Weather Poster
  - Weather Performance Project - Make a Weather Poster Rubric

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

- Rubrics
- Module Performance Project Rubric
- Student self-regulation or self-monitoring
- Peer Evaluation
- Lesson Trackers
- Aggressive Monitoring
- Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Some students may think that an animal can live anywhere. Tell students that there are connections between where animals live, their body parts, and their needs. For example, a polar bear has thick fur for warmth and lives in the cold, icy habitat of the Arctic. Some students may think that the animals in a given environment are not dependent on each other. Remind students of what they learned about animals eating other animals. Tell them that some animals, such as birds, use animal parts, such as feathers and fur, to build their nests. Students may also think that all animals need the same amounts of some things, such as water. However, some animals drink very little, if any, water, and some drink a lot of water. Desert animals, for example, typically get all the water they need from the leaves of cactus plants.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

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.
Plan for tiered learning

THE LESSON IN ACTION: Lesson 3, Day 1 and 2 - Assess and Engage

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

Lesson Opening

Do Now:

- **ASK:**
  - Why do you think that animals live in places that have the things they need?

During the Lesson

Assess Lesson Readiness- Page Keeley Science Probe: Places Where Animals Live

- This probe can be used as an elicitation prior to introducing a lesson on where animals live.
  - This probe 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 whom they most agree and explain why they agree.
  - This format helps students recognize that people have different ideas about science and it is important to share these ideas.
- Introduce the probe by telling students that three friends are talking about where animals live.
  - They each have different ideas about where animals live. Point to each character in the probe, say the character's name, and read their claim.
  - Make sure students understand what each character is saying.
- Then ask the students to choose the friend they think has the best idea about where animals live.
  - 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. Use their ideas to plan instruction during the module that will address their misconceptions and help them gain new knowledge and use appropriate terminology related to animals and the habitats they live in.

Science in My World - Phenomenon:

- Show the video, and ask students what questions they have about the deer.
- Record their questions on the board to revisit at the end of the lesson.
  - 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 do you see in the video?
  - What can you tell about where the deer lives?
  - Why do you think the deer lives there?
  - What did you wonder about when you saw the video?
- Help students turn their observations from the video into questions that they can refer to during the lesson. Explain to 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: Animal Trainer

- Introduce Career Kid Jordan, who wants to be an animal trainer when he grows up. An animal trainer is interested in learning about how animals behave and learn.
- As a class, read what Jordan says in the speech bubble.

- **ASK:**
  - What would an animal trainer be interested in knowing about animals? *(Sample answer: An animal trainer would want to know what an animal needs to survive and where it lives.)*
- Explain to students that animal trainers help animals learn different behaviors.
- Ask students to share their experiences with any pets they may have and how they may have trained their pets. For example, they may have trained a bird to talk or a dog to obey commands such as "sit," "stay," or "roll over."
- Watch the video about Jordan with students.

Essential Question: What do different kinds of animals live?

- Have students follow along as you 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 board so they can reference them throughout the lesson.

Lesson Closing

Science and Engineering Practices:

- **I will** *develop a model*.
- **I will** *use a model*.
- Have students follow along as you read the "I will . . ." statement.
  - Throughout the lesson, students will learn about places that animals live. If this is the first time you are teaching the Science and Engineering Practices of developing and using models, explain that scientists develop a model or a copy of something to study how it works. Models can be smaller or larger than the object a scientist studies.
- **ASK**:
  - What is one reason you would develop a model for an animal home? *(Sample answer: to learn more about what the animal needs to live and grow)*

THE LESSON IN ACTION: Lesson 3, Day 3 and 4 - Explore

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

Lesson Opening

Do Now:

- **ASK:**
  - Describe the Career of an Animal Trainer.

During the Lesson

Inquiry Activity: Animal Homes

- Students will choose an animal from a set of replicas and use different materials to build it a home. Students should draw and build an appropriate home or shelter for their animal.

Advanced Preparation:

- Gather building materials for students: clay, twigs, leaves, construction paper, craft sticks, and so on. Gather a variety of plastic animals. Point out that students just saw a video of a deer in its habitat. Now they will explore animal shelters.

Make a Model:

- Read aloud the instructions. Have groups choose an animal they want to build a home for. Have students complete their drawings of their animal homes. Read the third step of the investigation on the teacher presentation slide together with students.

Carry Out an Investigation:

- As you circulate around the room, encourage students to talk about what their animal needs to stay safe in its shelter. For example, a bird needs a nest to protect its babies. Bears may seek shelter in a cave. A groundhog will dig a burrow. Have students work together, using the building materials to construct a shelter for their plastic animal.

Record Data:

- Once students have constructed their animal homes, have them complete the task in their science notebook. Students should draw their animal home.

Talk About It:

- Ask students to share and discuss their animal homes with other groups.
- **ASK**:
    - What kind of animal home did you build? *(Sample answer: I built a nest with twigs and leaves for a bird. I built a cave with clay for a bear. I built a burrow with grass and clay for a chipmunk.)*
    - Why is it important for animals to have a home? *(Sample answer: so they have a place to raise their babies and to stay safe from other animals)*

Iggy Iguana Read Aloud:

- Read the fiction selection *Iggy Iguana* in the **Science Paired Read Aloud**.
- Flip through the illustrations, and ask students to predict what the selection will be about and who they think is the main character.
- Read the story aloud, stopping frequently to ask students questions that use close reading skills, such as:
    - "On which pages do we learn what Iggy likes to eat?" *(pp. 10–11)*
    - "How can Iggy stay away from predators in the desert?" *(By running away and ducking into a hiding spot, p. 13)*
- Use the following discussion questions to check that students have understood the key details in the story.
- **ASK:**
    - Where is Iggy's habitat? *(Sample answer: Sonoran Desert)*
    - Why is the desert a good place for Iggy to live? *(Sample answer: It is a dry place, and her body likes to be dry.)*
    - What is the best part of being an iguana, according to Iggy? *(Sample answer: Being fast is the best thing about being an iguana.)*

Lesson Closing

- To conclude, distribute a piece of paper to each student and have them draw a picture of Iggy in her habitat.
- Tell students to be sure that their pictures include the things Iggy needs to live.
    - You may want to post some key words from the read aloud on the board to help students label their drawings.

THE LESSON IN ACTION: Lesson 3, Day 5, 6, and 7 - Explain

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

Lesson Opening

Do Now:

- **ASK:**
  - Why is a desert a good place for Iggy Iguana to live? Think back to the story.

During the Lesson

Obtain and Communicate Information: Vocabulary:

- Read aloud the vocabulary words listed.
- Have students circle vocabulary words that they have heard before.
- Using the presentation slide, display the words and read their definitions.
  - You might want to add the words to a word wall so students 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.
  - **ecosystem**- all the living and nonliving things in an environment
  - **habitat**- a place where plants and animals live

Animal and Plant Habitats Read Aloud:

- Read aloud the nonfiction selection Animal and Plant Habitats in the **Science Paired Read Aloud**.
- Students will learn how animals get what they need from their environments.
- Explain that the selection is about different habitats and that different habitats can have different temperatures and amounts of rainfall.
- Ask students if they can tell what the temperature might be from looking at the pictures.
- While listening, students will encounter the vocabulary words: *habitat and ecosystem*.
- **ASK:**
  - What is a habitat? *(Sample answer: A habitat is a place where animals and plants live.)*
  - How do plants and animals get what they need from their habitat? *(Sample answer: Plants and animals live near what they need, and they work together in the habitat.)*
  - What kind of habitat do you live in? *(Answers will vary.)*

Develop Vocabulary:

- **ecosystem; habitat**
- Tell students that a forest is a habitat for many living things and all the living things and nonliving things in and around the forest form an ecosystem. The nonliving things in the forest include the air, Sun, and soil.
- Have students draw their own representation of a forest and label it using the vocabulary words.

Talk About It:

- After completing the read aloud, have students talk with a partner about what they learned. Help them use the vocabulary words. Then review with students what animals need to live in a habitat, and the connection between a habitat and an ecosystem.

Where Do Animals Live? Video:

- Have students watch the video Where Do Animals Live? Use the following questions to discuss what students learned and to check that they understand concepts from the video.
- **ASK**:
  - What do gorillas in the rainforest eat? *(Sample answer: Gorillas eat leaves, fruit, and bark.)*
  - How do some desert animals get water? *(Sample answer: They eat insects, fruit, and seeds.)*
  - How do tortoises stay cool in the desert? *(Sample answer: They dig burrows underground.)*
  - What animals live in the Arctic tundra? *(Sample answer: polar bears, walruses, and whales)*

- Then read aloud the instructions for this section. Help students complete the activity.

Talk About It:

- Use the **Talk About It** questions to assess students' understanding of what they have learned so far. If students do not demonstrate understanding about animal habitats, then have them revisit some activities in this lesson.
- **ASK**:
  - What are some habitats where animals and plants live? *(Sample answers: forests, ponds, the arctic, a grassland, rainforest, desert)*
  - Why wouldn't you find a polar bear in a desert? *(Sample answer: A polar bear needs a cold place to live. It would not be able to find the food it needs to eat in a rainforest or desert.)*
- Encourage students to use the module vocabulary and concepts as they discuss.

Inquiry Activity: Rainforest and Desert Animals

- Students will identify desert and rainforest animals.

Advanced Preparation:

- Prior to the activity, obtain a variety of picture cards that show desert and rainforest animals.

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. Read aloud the activity text. Have students circle their answers to the questions.

Carry Out an Investigation:

- Read aloud the steps of the investigation on the teacher presentation slide to students. Explain that they will be making additions to their murals of the rainforest and the desert from Lesson 2. Show the pictures you have collected of animals from the two different habitats, offer the names of the animals, and take questions or information from students about each animal. Next, distribute blank pieces of white paper, and ask students to pick an animal they like from the photographs and draw and color it. Once students have finished, have them add their animal to the correct habitat mural, either desert or rainforest.

Record Data:

- Once students have added their rainforest or desert animals to the mural, read aloud the instructions and have them complete their drawings.

Talk About It:

- Ask students to share and discuss their animals and habitats with other groups.
- **ASK:**
  - How is the animal you drew suited to its habitat? *(Sample answer: Frogs live in wet climates, such as rainforests. The frog would not be able to survive in the dry desert. A snake does not need a lot of water and can tolerate the wide daily temperature changes in a desert.)*
  - How does your animal get what it needs from its habitat? *(Sample answer: Frogs eat insects that live in the rainforest, and they have feet that help them climb plants and trees.*
- Encourage students to use the module vocabulary and concepts as they discuss.

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
- **ASK:**
  - What animals live in the rainforest? What animals live in the desert? *(Sample answers: Frogs, toucans, and gorillas can live in the rainforest. Snakes, tortoises, and iguanas can live in the desert.)*

- Complete the graphic organizer as a class. If students were not able to classify whether animals live in a rainforest or a desert, have them review the video, Where Do Animals Live?

Lesson Closing

Reflect and Refine: Places Where Animals Live

- 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 places where animals live. 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** *develop a model.*
- **I can** *use a model.*
- Read aloud the text in the **Science Notebook**. Have the class say the "I can . . ." statements together. Then have students tell a partner what they can do. The "I can . . ." statement for this lesson references the Science and Engineering Practice of developing and using models.
- **ASK**:
  - What did you do to make a model that shows where animals live? *(Sample answer: I drew a picture of animals that live in the rainforest and in the desert.)*
  - What did you learn from your model? *(Sample answer: I learned that animals are able to survive in different places.)*

THE LESSON IN ACTION: Lesson 3, Day 8 - Elaborate

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

Lesson Opening

Do Now:

- **ASK:**
  - Describe one example of a desert animal and a rainforest animal.

During the Lesson

Research, Investigate, and Communicate: Inquiry Activity - Things Humans Need:

- Students will investigate what humans need to survive. Students will draw a picture that shows what humans need to survive, such as food, air, water, and shelter.

Make a Model:

- Remind students that the word survive means to "stay alive." Read aloud the directions for the activity in the **Science Notebook**. Explain to students that they will work with a classmate to discuss and record the things humans need to survive.
- Begin by talking with students about what things they do each day. Ask students what they do as soon as they wake up each morning and trace their activities throughout the day until they go to bed. Once they have been able to identify the different things they do in a day, have them complete the drawing activity.
- Once students have finished their pictures of the things humans need every day, they should choose two of those things and talk about where humans get those things. You may wish to model by explaining one, such as air. Humans need air all day and all night. They get it from all around them. Encourage students to try to use the lesson vocabulary to help explain their drawing.

Talk About It:

- Have students share their observations and models with their classmates.
- **ASK:**
  - Choose two things that humans need to survive. How do humans get those things? *(Sample answer: People need water and shelter. Humans get those things from the rivers, lakes, and streams. They build shelters using wood from trees.)*
  - Do humans need the same things as animals? Explain why you think so. *(Sample answer: Yes, Humans are animals. They all need air, water, food, and shelter to survive.)*

Lesson Closing

Crosscutting Concepts- Systems and System Models:

- If this is the first time you have taught the Crosscutting Concept of systems and system models, help students understand that animals are part of the natural world and depend on their environment to survive. Students should recognize systems in the activities they have done in this lesson.
- **ASK:**
  - How do people get what they need from the place they live? *(Sample answers: people plant gardens, manage farms, use streams and rivers for water)*
  - Why do some animals live in some places and not others? Can you give an example? *(Sample answers: Animals live in places where they can get all of their needs. Some animals, such as a polar bear, would not be able to survive in a hot place such as a desert.)*

THE LESSON IN ACTION: Lesson 3, Day 9 and 10 - Evaluate

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

Lesson Opening

Do Now:

- **ASK:**
  - How are tornadoes and hurricanes similar? How are they different?

During the Lesson

Performance Task: Habitat Model

- Students will use what they have learned about places animals live to make a habitat model. Students will choose a habitat to research. They will cut out pictures of animals that live in the habitat from magazines. Students should draw the habitat model and glue pictures of animals to the model.

Advanced Preparation:

- Students will need books, Internet resources, pictures, or fact cards for a variety of habitats to conduct their research. Assemble grade-appropriate research materials prior to class. You may want to gather these materials and create an example model ahead of time to use as a visual to support students who struggle with the activity.
- Read the steps of the investigation on the teacher presentation slide together with students.

Make a Model:

- Explain to students that they will choose an animal and research where their animal lives, what it eats, how it gets water, and what the animal's habitat is like. Offer students books on a variety of animals, such as mammals, birds, reptiles, amphibians, and fish. Provide Internet resources, pictures, or fact cards on a variety of these animals. You may also want to have the school librarian help the class find books about animals.

- Then guide students by choosing an animal and modeling how to find the information about its needs and habitat in the resources you are providing. Allow students to begin their research on an animal of their choice, helping students as necessary. Have students complete their habitat model drawings in their **Science Notebook**. Help them select the pictures from magazines to glue to their model as needed.
- If time and materials allow, have students use classroom materials to build animal habitats based on their drawings.

Talk About It:

- In this activity, students explored creating a model of a habitat for an animal that they choose.
- **ASK:**
  - How did your model compare to those of your classmates? *(Sample answer: My model was different from my classmate's because my animal lives in a rainforest and my classmate's animal lives in a desert.)*
  - How did this activity help you learn more about where animals can survive? *(Sample answer: I learned that animals can survive in different climates because they have different ways of meeting their needs. They might eat different foods and need different kinds of shelter.)*

Essential Question: Where do different kinds of animals live?

- Phenomenon: Revisit the lesson phenomenon video. Have students refer back to this question in the **Science Notebook** and the answers you recorded.
- Ask them if and how their thinking has changed. Discuss and share their answers as a class. Write a single sentence that captures the group's response on the board, and have students copy the class answer to the Essential Question in their **Science Notebook**.
  - Help students who may struggle with the writing task.

Assessment:

- Students will complete the **Lesson 3:** *Places Animals Live*

Lesson Closing

Science and Engineering Practices:

- **I did** *develop a model*.
- **I did** *use a model*.
- Refer to the "I will . . ." and "I can . . ." statements in the **Science Notebook**.
- **ASK**:
  - Have you developed a model? If so, how? *(Sample answer: Yes, I made a model of a habitat that an animal could live in and survive.)*
- Read together as a class the "I did . . ." statements in their **Science Notebook**.

THE LESSON IN ACTION: Lesson 3, Day 11 and 12 - Module Performance Project

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

Lesson Opening

Do Now:

- **ASK:**
  - Where do different types of animals live?

During the Lesson

Module Wrap-Up: Performance Project

- **Make a Diorama**

● Students will construct a diorama to show how animals and plants live together in an environment. They will apply their knowledge of plant and animal needs and how they get their needs from their habitats to construct the diorama. **Assessment:** ● Students will complete the **Plants and Animals Module Test**
Lesson Closing
Module Wrap-Up: ● Students will identify plants and animals in their own environment that might not survive in another environment.

Lesson 3 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius
-

Module 4:
Weather

Stage 1 – Desired Results

ASSESSED FOCUS STANDARDS:

- **ESS2.D:** Weather and Climate
  - Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time.
- **ESS3.B:** Natural Hazards
  - Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events.
- **ETS1.A:** Defining and Delimiting an Engineering Problem
  - Asking questions, making observations, and gathering information are helpful in thinking about problems.

CONTENT CONNECTIONS:

ELA/Literacy

- **RI.K.1** With prompting and support, ask and answer questions about key details in a text.
- **SL.K.3** Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
- **SL.K.5** Add drawings or other visual displays to descriptions as desired to provide additional detail.

Mathematics

- **MP.2** Reason abstractly and quantitatively.

Unit Description

Anchoring Phenomenon: A storm

Statement: Weather is always changing.

Observation/Demonstration/Experience: A video about a storm

Driving Question: How do we measure and describe weather?

Meaning

ENDURING UNDERSTANDINGS:

- Weather is the condition of the air and the sky outside at a certain place each day or over a period of time.
- There are many different tools that scientists use to measure and predict the weather.

ESSENTIAL QUESTIONS:

- How do we measure and describe weather?
- What weather patterns do you observe in the seasons?
- What does the weather forecast tell us about

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K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
K.MD.B.3 Classify objects into given categories; count the number of objects in each category and sort the categories by count.

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One type of tool used to measure weather is a thermometer. A thermometer measures temperature.
We experience weather every day, and we adjust our behavior and the way we dress to accommodate the changes in weather as they occur.
Weather can be difficult to predict, but we can use seasons, historical data, and patterns to inform an educated guess about what type of weather will be coming.
We can also use seasons and patterns to predict natural occurrences, such as possible hurricanes or tornadoes, plants starting to grow, or trees losing their leaves.
Certain patterns of weather happen in certain seasons.
In many places on Earth, the winter is more likely to have colder temperatures and precipitation in the form of snow and ice. In the spring in many places, there is more rainfall and temperatures that are warmer than winter but still cooler than the summer.

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<td>severe weather?</td>
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<td colspan="2">What students will know and be able to do</td>
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<u>KNOWLEDGE:</u>

Students will learn about weather tools and use these tools to measure and describe the weather. (Lesson 1)
Students will be able to describe weather using their observations of patterns in day-to-day weather and the seasons. (Lesson 2)
Students will ask questions and obtain information about severe weather in order to forecast the weather. (Lesson 3)

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<u>SKILLS:</u>

K-ESS2-1: Use and share observations of local weather conditions to describe patterns over time.

[Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] [Assessment

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		Boundary: Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.] ○ Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. ○ Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. ● **K-ESS3-2:** Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. ○ [Clarification Statement: Emphasis is on local forms of severe weather.] ○ Ask questions based on observations to find more information about the designed world. ○ Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. ○ Events have causes that generate observable patterns. ○ People encounter questions about the natural world every day. ○ People depend on various technologies in their lives; human life would be very different without technology.

Stage 2 – Evidence

SUMMATIVE ASSESSMENT(S)

- Performance Task - Make a Weather Poster (Lesson 1)
- Weather Lesson 1 Test
- Performance Task - Make a Seasons Foldable (Lesson 2)
- Weather Lesson 2 Test
- Performance Task - Make a Video (Lesson 3)
- Weather Lesson 3 Test
- Weather Module Performance Project - Make a Weather Poster
  - Weather Performance Project - Make a Weather Poster Rubric

- Weather Module Test
- STEM Gauge #466692
- STEM Gauge #466781
- STEM Gauge #466773

PRE-ASSESSMENT

- Page Keeley Science Probe - Thermometer (Lesson 1)
- Page Keeley Science Probe - Weather Patterns (Lesson 2)
- Page Keeley Science Probe - Forecast (Lesson 3)

Integration of 21st Century Skills	Integration of Technology	Career Education
• **9.1.4.A.1:** Recognize a problem and brainstorm ways to solve the problem individually or collaboratively. • **9.1.4.A.2:** Evaluate available resources that can assist in solving problems. • **9.1.4.A.3:** Determine when the use of technology is appropriate to solve problems. • **9.1.4.A.4:** Use data accessed on the Web to inform solutions to problems and the decision-making process. • **9.1.4.A.5:** Apply critical thinking • **9.1.4.B.1:** Participate in brainstorming sessions to seek information, ideas, and strategies that foster creative thinking. • **9.1.4.D.1:** Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience. • **9.1.4.E.2:** Demonstrate effective communication using digital media during classroom activities. • **9.3.4.A.2:** Identify various life roles and civic and work-related activities in the school, home, and community. • **9.3.4.A.3:** Appraise personal likes and dislikes and identify careers that might be suited to personal likes. • **9.3.4.A.4:** Identify qualifications needed to pursue traditional and nontraditional careers and occupations.	• **Inspire Science Videos** ○ Kinds of Weather ○ Weather in Seasons ○ Thunderstorm ○ Tornado Warning ○ Kinds of Severe Weather • **Inspire Science Digital Interactives** ○ Rain Gauge ○ Seasons ○ Seasons in Different Places ○ Forecasting Weather ○ Types of Severe Weather ○ Tools For Severe Weather ○ Impacts of Severe Weather • **Discovery Education** ○ Weather • **Mystery Science** ○ How Many Different Kinds of Weather Are There? ○ Have You Ever Watched a Storm? ○ How Can You Get Ready For a Big Storm? • **Generation Genius** ○ Introduction to Weather ○ Weather vs. Climate • **Google Classroom Virtual Assignments** • **Bill Nye "Weather" Videos** ○ Seasons ○ Storms ○ Wind • **Science Max**	• **Park Ranger** ○ Introduce Career Kid Poppy, who wants to be a park ranger when she grows up. A park ranger helps visitors, plants and animals in the park. They need to know how seasons and weather will affect everything in the park. A park ranger needs to be prepared to respond to all different types of weather. • **Meteorologist:** ○ Introduce Career Kid Hugo, who wants to be a meteorologist when he grows up. A meteorologist studies weather and weather conditions. They find patterns in the weather.

• **9.3.4.A.5:** Locate career information using a variety of resources.	○ Weather • **Crash Course Kids** ○ Videos	

Stage 3 – Learning Plan

UNIT VOCABULARY

• blizzard • hurricane • severe weather • thunderstorm	• cool • patterns • temperature • tornado	• forecast • seasons • thermometer • weather

SUMMARY OF KEY LEARNING

Lesson 1: Describe Weather

Lesson 1: Day 1 - Describe Weather - Module Opener

- **Learning Intention:** I am learning the effects of a thunderstorm.
- **Success Criteria:** I can explain the phenomenon of a storm.
- **Brief Overview of Lesson:** Students will watch a short video about the phenomenon of a storm. Students will answer questions and complete an activity in their ***science*** **notebook.** Students will be introduced to the STEM career of a Park Ranger.

Lesson 1: Day 2 and 3 - Describe Weather - Assess and Engage

- **Learning Intention:** I am learning that the temperature difference between ice and hot water will cause condensation.
- **Success Criteria:** I can ask questions about the phenomenon and what I want to learn about it. I can discuss my explanations of the phenomenon by observing a video. I can choose which friend they think has the best idea about what a thermometer measures by completing the Page Keeley Science Probe. I can make initial explanations by observing a photo of water droplets.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Thermometer*. This is intended to serve as a pre-assessment and uncover students' basic ideas about weather and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *water droplet in a jar* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will also be introduced to the **Career Connection** of a *Meteorologist* and answer questions in their notebook

Lesson 1: Day 4 and 5 - Describe Weather - Explore

- **Learning Intention:** I am learning that time and weather conditions impact rainfall levels.
- **Success Criteria: I can** complete a digital simulation. I can identify and describe different weather conditions.
  I can answer the question "How do time and weather conditions affect rainfall levels?" by creating those conditions with a digital simulation. I can identify weather conditions by observing and recording the weather for three consecutive days.
- **Brief Overview of Lesson:** Students will complete a digital simulation about measuring rainfall levels. Before starting the simulation, students will make a prediction about what they think will happen. Students will answer questions in their science notebook. Students will share their observations with classmates. Students will listen to the teacher read-aloud *A Day's Worth of Weather!* Students will answer questions about the text. Students will make a prediction and complete an **Inquiry Activity -** *Weather Graph* in which they record data from their observations of the weather for three consecutive days. Teacher will conclude the lesson by leading a class discussion and asking students to reflect on both activities.

Lesson 1: Days 6 and 7 - Describe Weather - Explain

- **Learning Intention:** I am learning about different types of weather and seasons.

- **Success Criteria:** I can answer questions by reading and responding to the text. I can explain how the temperature correlates to the way the air feels by measuring the temperature inside and outside.
- **Brief Overview of Lesson:** Students will be introduced to the vocabulary that is covered in this lesson. Teacher will read-aloud an informative text, *Weather and Seasons*. The teacher will ask students what questions they still have about weather and seasons, leading a class discussion. Students will discuss the text with a partner and draw what they learned about in their science notebook**.** Students will complete the **Inquiry Activity -** *Measure the Temperature.* Students will answer questions and draw a picture of that day's weather in their science notebook. Students will revisit the **Page Keeley Science Probe -** *Thermometer* and change or justify their previous answers.

Lesson 1: Day 8 - Describe Weather - Elaborate

- **Learning Intention:** I am learning that wind affects objects differently depending on how heavy the objects are.
- **Success Criteria:** I can observe that wind affects objects differently depending on how heavy the objects are. I can explain how wind affects objects differently by completing an Inquiry Activity.
- **Brief Overview of Lesson:** Students will complete an Inquiry Activity to observe how wind affects objects differently depending on how heavy the objects are. Prior to starting the Inquiry Activity, students will make a prediction about what they expect to observe. Students will carry out the investigation, answer questions, and draw their observations in their scienc**e** notebook. Teacher will wrap-up the lesson by asking students to reflect on the investigation.

Lesson 1: Day 9 - Describe Weather - Evaluate

- **Learning Intention:** I am learning how different weather conditions are measured.
- **Success Criteria:** I can categorize types of weather by the tool (thermometer or rain gauge) used to describe them. I can categorize types of weather and describe them by making a weather poster.
- **Brief Overview of Lesson:** Students will label their poster with the words *thermometer* and *rain gauge*. During the performance task, students will cut out pictures from magazines and newspapers that show different types of weather. They will glue the pictures beneath the corresponding word. Students will share their posters with classmates and answer a wrap-up.

Lesson 2: Weather Patterns

Lesson 2: Day 1 and 2 - Weather Patterns - Assess and Engage

- **Learning Intention:** I am learning about different weather patterns.
- **Success Criteria:** I can describe a weather pattern. I can make initial explanations about weather in different seasons.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Weather Patterns.* This is intended to serve as a pre-assessment and uncover students' basic ideas about weather patterns and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *weather in different seasons* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will also be introduced to the **Career Connection** of a *Meteorologist* and answer questions in their notebook.

Lesson 2: Day 3 - Weather Patterns - Explore

- **Learning Intention:** I am learning about different weather patterns.
- **Success Criteria:** I can investigate my environment for clues about the current season by completing the Inquiry Activity, *Nature Walk*. I can use clues from my environment to identify the current season.
- **Brief Overview of Lesson:** Students will play detective to find clues about the current season. Clues will vary depending on the time of year the activity is conducted and may include items such as fallen leaves in fall or new flowers in spring. Instead of actually going on a nature walk, the

teacher could play a video simulation of a walk through the woods, for example, and ask students to draw clues of what they see in the video. The goal is for students to identify things that can be used to reveal the current season. The teacher will lead a class discussion by asking questions. The teacher should be looking for students to discern patterns in the day-to-day weather that are similar to the general weather of that season. *(**If planned far enough in advance, this lesson might be an opportunity for a field trip to a state park, for example and actually do take the students on a Nature Walk**)*

Lesson 2: Day 4, 5, and 6 - Weather Patterns - Explain

- **Learning Intention:** I am learning that weather patterns can change depending on the season.
- **Success Criteria:** I can recognize patterns in the weather during different seasons.
- **Brief Overview of Lesson:** Students will be introduced to the vocabulary that is covered in this lesson. Teacher will read-aloud an informative text, *Weather and Seasons.* The teacher will ask students what questions they still have about weather and seasons, leading a class discussion. Students will discuss the text with a partner and draw what they learned about in the ***science notebook*.** Students will use the **Digital Interactive -** *Seasons* to answer questions about the patterns of weather during the different seasons. Students will complete the **Inquiry Activity -** *Five-Day Forecast.* Students will answer questions and draw a picture of the weather during a five-day span *(Ideally, use a past forecast that includes detailed information about temperature, wind speed, and precipitation)* in the ***science notebook*.** Students will revisit the **Page Keeley Science Probe -** *Weather Patterns* and change or justify their previous answers.

Lesson 2: Day 7 - Weather Patterns - Elaborate

- **Learning Intention:** I am learning that weather patterns can change depending on the climate.
- **Success Criteria:** I can explore seasons in other states and describe the differences in climate in the North and South.
- **Brief Overview of Lesson:** Students will explore the digital interactive about seasons in other states and answer questions in the ***science notebook.*** Students will complete the **Inquiry Activity -** *Favorite Season.* Using data from the activity, the class will create a pictogram and interpret the data to answer questions about patterns in students' favorite seasons.

Lesson 2: Day 8 - Weather Patterns - Evaluate

- **Learning Intention:** I am learning the seasons and patterns.
- **Success Criteria:** I can show what I know about the seasons and patterns of weather.
- **Brief Overview of Lesson:** Students will complete the **Performance Task -** *Make a Seasons Foldable.* Students will demonstrate their understanding of the seasons and patterns by drawing and coloring four trees. The teacher will lead a class discussion about similarities and differences in the seasons. Students will watch a short video and revisit the **Essential Question -** ***What weather patterns do you observe in the seasons?*** Students will complete the *Lesson 2 - Weather Patterns* assessment.

Lesson 3: Forecasting and Severe Weather

Lesson 3: Day 1 and 2 - Forecasting and Severe Weather - Assess and Engage

- **Learning Intention:** I am learning that the weather can be forecasted.
- **Success Criteria:** I can identify the best idea about what it means to forecast the weather
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Forecast.* This is intended to serve as a pre-assessment and uncover students' basic ideas about severe weather and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a thunderstorm* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Meteorologist* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *What does a weather forecast tell us about severe weather?*

Lesson 3: Day 3 and 4 - Forecasting and Severe Weather - Explore

- **Learning Intention:** I am learning how to forecast the weather.
- **Success Criteria:** I can predict the weather and then check my predictions.
- **Brief Overview of Lesson:** Students will review their weather data from the activity *Weather Report* from Lesson 1 of this module. They will predict the next day's weather based on the collected data. On the following day, they will check the actual weather to see if their prediction was correct. Students will share their observations from the data with the class and answer questions. Teacher will read the **Science Paired Read Aloud -** *Storm Warnings* and students will answer questions about the text.

Lesson 3: Day 5, 6, 7, 8, 9, and 10 - Forecasting and Severe Weather - Explain

- **Learning Intention:** I am learning how meteorologists use data to make weather forecasts.
- **Success Criteria:** I can answer the question "How do time and weather conditions affect rainfall levels?" by creating those conditions with a digital simulation. I can identify how meteorologists forecast weather.
- **Brief Overview of Lesson:** Students will be introduced to the vocabulary that is covered in this lesson. Students will revisit the types of weather and weather tools from Lesson 1, and review how the weather tools help meteorologists tell what the weather is going to be. Teacher will lead a class discussion to gauge what students have learned up to this point in the lesson. Students will watch a **Video -** *Kinds of Severe Weather* and answer questions. Teacher will read the nonfiction selection **Science Paired Read Aloud** - *Severe Weather* and students will explore the digital interactive about how meteorologists forecast weather. Students will revisit the **Page Keeley Science Probe -** *Forecast* and change or justify their previous answers.

Lesson 3: Day 11 and 12 - Forecasting and Severe Weather - Elaborate

- **Learning Intention:** I am learning that weather conditions can create severe storms like blizzards, hurricanes and thunderstorms.
- **Success Criteria:** I can identify and describe severe weather by completing a digital interactive.
  I can describe blizzards, hurricanes, tornadoes, and thunderstorms. I can describe the tools meteorologists use to measure and describe severe weather.
- **Brief Overview of Lesson:** Students will complete the **Digital Interactive -** *Types of Severe Weather*. Students will learn more about blizzards, hurricanes, tornadoes, and thunderstorms and answer questions. Students will complete the **Digital Interactive -** *Tools for Severe Weather*. Students will learn more about the tools meteorologists use to measure and describe severe weather and answer questions.

Lesson 3: Day 13 and 14 - Forecasting and Severe Weather - Evaluate

- **Learning Intention:** I am learning that data can be used to forecast weather.
- **Success Criteria:** I can make a video forecasting the next day's weather by playing the role of TV weather reporters.
- **Brief Overview of Lesson:** Students will play the role of TV weather reporters and make a video forecasting the next day's weather. *(**Consider asking students to bring costumes to wear in their roles as TV weather reporters.**)* Students will review the different types of severe weather, choose one that they want to report on, and develop a forecast like they've seen on television. Students will share their forecasts with the class, playing the role of television reporter. Students will revisit the **Essential Question -** *What does a weather forecast tell us about severe weather?*

Lesson 3: Day 15 and 16 - Weather Module Performance Project

- **Learning Intention:** I am learning that weather forecasts can be used to inform people about the weather.
- **Success Criteria:** I can communicate the forecast for severe weather to park patrons and help them prepare for weather conditions by creating a poster**.** I can create a severe weather informational poster.
- **Brief Overview of Lesson:** Students will make a poster to explain how to prepare for the weather. Students will find pictures in magazines of weather and cut them out and then glue them on the poster to show kinds of weather and how to prepare for them. This poster should be used in

the scenario with **Career Kid** *Poppy* to help her prepare for the park's birthday party. Students should find pictures that show weather conditions *Poppy* might expect and how to prepare for them. Encourage students to think about what it means that the weather has been rainy for the past few days. Students should think about weather patterns and forecasting while creating their posters.

CULTURALLY RESPONSIVE TEACHING in PRACTICE	SOCIAL EMOTIONAL LEARNING in PRACTICE
● Search for famous scientists in the field of "Weather" ● Search for current events related to weather, weather patterns, severe weather, etc. ● Try to find examples of a Park Ranger and Meteorologist from different cultures	● Responsible Decision-Making ○ Making ethical, constructive choices about personal and social behavior ● Relationship Skills ○ Forming positive relationships, working in teams, dealing effectively with conflict

Lesson 1:	**Describe Weather**	**Estimated Time: 9 days (45 minutes per day)**

Brief Overview of Lesson:

- **Day 1:** Students will watch a short video about the phenomenon of a storm. Students will answer questions and complete an activity in their ***science*** **notebook.** Students will be introduced to the STEM career of a Park Ranger.
- **Day 2 and 3:** Students will complete the **Page Keeley Science Probe -** *Thermometer*. This is intended to serve as a pre-assessment and uncover students' basic ideas about direction and force and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *water droplet in a jar* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will also be introduced to the **Career Connection** of a *Meteorologist* and answer questions in their notebook.
- **Day 4 and 5:** Students will complete a digital simulation about measuring rainfall levels. Before starting the simulation, students will make a prediction about what they think will happen. Students will answer questions in their notebook. Students will share their observations with classmates. Students will listen to the teacher read-aloud *A Day's Worth of Weather!* Students will answer questions about the text. Students will make a prediction and complete an **Inquiry Activity -** *Weather Graph* in which they record data from their observations of the weather for three consecutive days. Teacher will conclude the lesson by leading a class discussion and asking students to reflect on both activities.
- **Days 6 and 7:** Students will be introduced to the vocabulary that is covered in this lesson. Teacher will read-aloud an informative text, *Weather and Seasons.*The teacher will ask students what questions they still have about weather and seasons, leading a class discussion. Students will discuss the text with a partner and draw what they learned about in their **notebook.** Students will complete the **Inquiry Activity -** *Measure the Temperature*. Students will answer questions and draw a picture of that day's weather in their science notebook. Students will revisit the **Page Keeley Science Probe -** *Thermometer* and change or justify their previous answers.
- **Day 8:** Students will complete an Inquiry Activity to observe how wind affects objects differently depending on how heavy the objects are. Prior to starting the Inquiry Activity, students will make a prediction about what they expect to observe. Students will carry out the investigation, answer questions, and draw their observations in their science notebook. Teacher will wrap-up the lesson by asking students to reflect on the investigation.

- **Day 9:** Students will label their poster with the words *thermometer* and *rain gauge*. During the performance task, students will cut out pictures from magazines and newspapers that show different types of weather. They will glue the pictures beneath the corresponding word. Students will share their posters with classmates and answer a wrap-up question in their science notebook.

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

- Weather is the condition of the air and the sky outside at a certain place each day or over a period of time. We use many ways to explain and describe weather: temperature, how clear the sky is, if there is precipitation, the atmospheric (air) pressure, how strong the wind is blowing, and humidity. All of these factors contribute to the types of weather we experience. There are many different tools that scientists use to measure and predict the weather. One type of tool used to measure weather is a thermometer. A thermometer measures temperature.

LESSON FOUNDATION	
Assessed Standards for this lesson	**Important content not included in the standards**
ESS2.D: Weather and Climate • Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time.	• Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. • Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.
Focus Question for this Lesson	
How do we measure and describe weather?	
Learning Intention	**Success Criteria**
I am learning that we can use tools to measure the weather.	*I can describe and explain weather tools and use those tools to measure and describe the weather.*
Assessment(s)	
• Page Keeley Science Probe - Thermometer (Lesson 1) • Performance Task - Make a Weather Poster (Lesson 1) • Weather Lesson 1 Test	
Feedback (Peer to peer/student to teacher/teacher to student)	
• Rubrics • Student self-regulation or self-monitoring • Peer Evaluation • Lesson Trackers • Aggressive Monitoring • Daily Checks for Understanding	

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS
Anticipated Student Pre-Conceptions/Misconceptions

- Students may think that they can know the temperature of objects by looking at them or touching them. However, this may be deceiving and dangerous. Thermometers can measure temperature exactly. Students may be aware that thermometers are used by parents, nurses, and doctors to measure body temperature, but they may not understand that thermometers also measure air temperature. Students may further not understand the effect of temperature on weather. They may think it should only snow in winter, not understanding that it might rain because the air temperature is too warm for snow to form.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

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.
Plan for tiered learning

THE LESSON IN ACTION: Lesson 1, Day 1 - Module Opener

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

Lesson Opening

Module Opener

- Introduce the module phenomenon by showing the video of the storm. Ask students what questions they have about the video. Use the questions below to elicit student responses.
- ASK:
  - When does lightning happen? *(Sample answer: during a thunderstorm)*
  - What weather often happens when lightning happens? *(Sample answer: wind and rain)*
  - How do you know if a thunderstorm might happen? *(Sample answer: You can watch, read, or listen to a forecast.)*

During the Lesson

- Read Poppy's problem. Direct students to think about ways people predict and prepare for different types of weather.
- **Introduce Key Vocabulary:**
  - blizzard, cool, forecast, hurricane, patterns, seasons, severe weather, temperature, thermometer, thunderstorm, tornado and weather
- Display the teacher presentation slide, and read the Key Vocabulary that students learn in this module. These words are a selection of important vocabulary that will be used throughout the module. Tell students to listen for these Key Vocabulary words as they complete the module.

STEM Career Kid Connection: Park Ranger

- Display the teacher presentation slide to introduce Poppy to students. Have them share their ideas about what a park ranger might do. Tell students that Poppy wants to be a park ranger. Explain that park rangers help the visitors, plants, and animals in the park. Poppy likes to learn about how seasons affect her park. She needs to know how the weather will affect everything in the park and be prepared to respond to all different types of weather.
- **SAY**:
  - Poppy is planning a birthday party for the park tomorrow. The party is supposed to happen outside. But she's worried there will be storms during the party. How can Poppy prepare?

Lesson Closing

Science and Engineering Practices:

- **I will** *communicate information*.
- **I will** *develop a model*.
- **I will** *analyze data*.
- Have students follow along as you read the "I will . . ." statements for this lesson reference Science and Engineering Practices that will be covered throughout the lessons.
  - If this is the first time you are teaching these Science and Engineering Practices, tell students they can communicate information by telling others about what they learn during an investigation. They can analyze data by looking at the data to see if they can identify any patterns or answers to questions they have. To develop a model, students will make a representation of a phenomenon, such as weather or the seasons. Models can be drawings, graphs, or other representations. Ask students for other ideas they have about these Science and Engineering Practices.

THE LESSON IN ACTION: Lesson 1, Day 2 and 3 - Assess and Engage

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

Lesson Opening

Do Now:

- **ASK:**
  - What do you already know about weather?

During the Lesson

Assess Lesson Readiness- Page Keeley Science Probe: Thermometer

- Introduce the probe by showing students a picture of the weather thermometer, or show them a real weather thermometer if you have one.
  - Tell students that it is a tool called a thermometer and that it helps us describe the weather.
  - Tell students that three friends are talking about the weather thermometer. They each have a different idea about what the thermometer measures.
  - Point to each character in the probe, say the character's name, and read what each character says to the students. Make certain students understand what each character is saying.
  - Ask students to choose the friend they think has the best idea about what a thermometer measures.
    - Make sure students focus on the characters' ideas and not the characters' looks, name, or other features they like the most.
  - Choose a talk configuration (pair, small group, whole class, or combination) and listen carefully as students share their thinking. Use talk moves to help students explain their thinking.

Science in My World: Phenomenon

- Spark your students' curiosity about the world by introducing the lesson phenomenon of *water droplets, or "rain," in a jar*.
- Conduct a brief demonstration.
  - You will need a canning jar with a lid, very hot water (almost boiling), and ice.
  - Pour about two inches of very hot water into the jar. Place the lid upside down on the jar, covering the mouth of the jar completely, and place ice in the lid. The temperature difference between the ice and the hot water will cause condensation, or water droplets, in the jar.
- Ask students what questions they have about the demonstration**.** 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 demonstration?
  - What did you notice about the "rain" in the jar?
  - What did you wonder about what you saw in the demonstration?
  - What interests you about the "rain" in the jar?
- Help students turn their observations from the demonstration into questions that they can refer to during the lesson. Tell students that they do not need to be able to answer the questions they generate right now. They will return to them later in the lesson. Record the class questions in a location that you can reference later.

STEM Career Kid Connection: Meteorologist

- Introduce Career Kid Hugo, who wants to be a meteorologist when he grows up. A meteorologist studies weather and weather conditions. Read to students what Hugo says in the speech bubble.
- **ASK:**
  - What tools does a meteorologist use? *(Sample answers: thermometer, rain gauge, wind vane)*
  - Why would a meteorologist need to be able to describe weather? *(Sample answers: Meteorologists have to know which types of weather are alike and which are different. They need words and tools to make comparisons.)*
- Have students brainstorm different words used to describe weather. Write their suggestions on the board. Show students the video. Ask students what they learned about Hugo.

Essential Question: How do we measure and describe weather?

- Have students follow along as you 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 may want to record students' answers, as well their thoughts and questions about the Essential Question, on chart paper or the board so that you can reference them throughout the lesson.
- **ASK:**
  - What words can you use to describe the inside of the jar? *(Sample answers: rainy, wet, steamy, sweaty)*

Lesson Closing

Science and Engineering Practices:

- **I will** *obtain information*.
- **I will** *communicate information*.
- **I will** *carry out an investigation*.
- Have students follow along as you read aloud the "I will . . ." statements. Throughout the lesson, students will obtain and communicate information about weather and carry out investigations to help them understand weather.
  - If this is the first time you are teaching the Science and Engineering Practices of obtaining and communicating information and carrying out an investigation, explain that data such as measurements or observations are collected during an investigation. Then scientists communicate the information.
- **ASK**:
  - What data could you collect about weather during an investigation? *(Sample answers: temperature, amount of rain, wind speed)*

THE LESSON IN ACTION: Lesson 1, Day 4 and 5 - Explore

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

Lesson Opening

Do Now:

- **ASK:**
  - Why does a meteorologist need to be able to describe the weather?

During the Lesson

Inquiry Activity- Rain Gauge Simulation

- Students will answer the question "How do time and weather conditions affect rainfall levels?" and create these conditions with a digital simulation.
  - Students will observe that sunny and overcast conditions produce no rain and that heavy rain gives higher levels of rainfall than light rain.
  - Students will also observe that the longer the rain lasts, the higher the level of rainfall under either rainy condition.
- Point out that students just saw "rain" form in a jar. Now they will investigate how rain is measured.
  - Read the instructions to students at the start of the simulation.
- 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 record their predictions in their science notebook. Have students explain their predictions based on previous observations.
- As students work through the simulation, have them consider the questions in their science notebook. Ensure they simulate the conditions required to answer the questions.

Talk About It:

- Use the Talk About It question to help students share their observations and data with their classmates. If they have difficulty answering, guide the discussion using the following questions.
- **ASK:**
  - How does time relate to rainfall levels? *(Sample answer: The longer it rains, the higher the rainfall level.)*
  - What patterns do you notice about rainfall levels? (*Sample answers: They are higher when it rains for a longer time. They are higher when rain is heavier.*
- What you should observe in this discussion is your students' ability to discern patterns. Students should notice that rainfall levels increase with time. The levels also increase with more severe weather conditions.

A Day's Worth of Weather! Read Aloud:

- Before reading, have students tell you what they already know about how weather can change during the day. Tell them that the story is about the weather throughout the day for Ravi. Read aloud A Day's Worth of Weather! on pages 4–13 in the Science Paired Read Aloud. As you read the selection, use the questions to guide student comprehension.
- **ASK**:
  - What do you wear when it is a rainy day? *(Sample answers: raincoat, rain boots)*
  - How did the wind help Ravi at soccer practice? *(Sample answer: It helped blow the ball into the goal.)*

Inquiry Activity- Weather Graph:

- Students will answer the question "What is the weather today?" and record the weather for three days.
- Students will identify weather conditions.
- Help students make a prediction.
  - Tell them to record their predictions in their science notebook. Then have students explain their predictions based on previous observations. Read the instructions to students.
- Students should record the weather conditions at the same time each day in their science notebook...

- You may wish to lead a class discussion about weather conditions at a particular time. Students should place an X in the box for the type of weather condition each day.

Lesson Closing

Talk About It:

- Have students share their observations and data with their classmates.
- **ASK**:
  - How do your observations compare to those of other students? *(Sample answer: Our data are the same.)*
  - Were there any patterns in the data? *(Answers will vary depending on weather conditions.)*
  - What patterns do you notice across the three days? *(Sample answer: The weather is similar for all three days.)*

THE LESSON IN ACTION: Lesson 1, Day 6 and 7 - Explain

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

Lesson Opening

Do Now:

- **ASK:**
  - What patterns did you notice in the three days that you observed the weather?

During the Lesson

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 slides, display the words and their definitions. You might want to add the words to a word wall so students 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
  - **cool**- somewhat cold, not warm or hot
  - **rain**- water droplets that fall from clouds to Earth
  - **weather**- what the sky and air are like each day
  - **warm**- somewhat hot, not cool or cold
  - **rainbow**- arc of colored light that appears in the sky
  - **clouds**- groups of water droplets in the sky

Weather and Seasons Read Aloud:

- Read: Weather and Seasons in the Science Paired Read Aloud.
  - Before reading, have students tell you what they already know about different types of weather. Have students ask new questions they still have about different types of weather. The vocabulary words weather, sunny, cloudy, rainy, snowy, and windy appear in this selection. Use Visuals as you read aloud the selection, use the question to guide student comprehension.

- **ASK:**
  - Look at the pictures of different types of weather. What type of weather is shown in each picture? *(Sample answers: sunny, cloudy, rainy, and snowy)*

Talk About It:

- Have students talk to a partner about Weather and Seasons. Encourage them to use the new vocabulary words as they discuss.
- **ASK:**
  - What new words did you learn in the reader? What do the words mean?
- Then have students draw a picture of what they talked about with their partner in their science notebook.

Develop Vocabulary:

- **temperature; thermometer** The words temperature and thermometer are very long for this age group. Help students understand these words by breaking them into word cards: tem, per, a, ture and ther, mom, e, ter. Shuffle the cards, and have students put them in the correct order to spell the words.

Visual Kinesthetic Vocabulary:

- Have students cut out and fill in the Dinah Zike Visual Kinesthetic Vocabulary from pages VKV213–VKV214**.**

Inquiry Activity: Measure the Temperature

- Students will answer the question "What can the temperature tell us about the weather?"
- Students will measure the temperature inside and outside. They should see that the temperature correlates to the way the air feels.
  - For example, a higher temperature feels warmer.
- 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 record their predictions in their science notebook.
- Then have students explain their predictions based on previous observations.
- Carry Out an Investigation
  - As a class, measure the temperature inside and outside.
  - Discuss which temperature is higher and feels warmer and which temperature is lower and feels cooler.
  - Then have students record their observations by completing the circling activity.

Talk About It:

- Have students share their observations and data with their classmates.
- **ASK**:
  - What is the temperature inside? *(Sample answer: 74 degrees Fahrenheit)*
  - What is the temperature outside? *(Sample answer: 24 degrees Fahrenheit)*
  - How are the temperatures different? *(Sample answer: The outside temperature is lower.)*

Kinds of Weather Video:

- Have students watch the video Kinds of Weather. Tell students they will watch a video that shows the different types of weather.
- **ASK**:
  - What is the weather like today? *(Sample answer: windy)*
  - Where does rain come from? *(Sample answer: Water falls from the sky when it cools. That's rain.)*
- Have students draw a picture of the weather today in their science 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
- **ASK**:
  - What was the weather like on Ravi's day? *(Sample answer: first: rainy; next: sunny; last: windy)*
- Complete the graphic organizer as a class.
  - If students were not able to place the descriptions in order or had difficulty with words used to describe weather, then have them review *A Day's Worth of Weather!* in the **Science Paired Read Aloud.**

Reflect and Refine - Thermometer:

- 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 using tools and words to describe weather.
  - Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

Lesson Closing

Science and Engineering Practices:

- **I can** obtain information.
- **I can** communicate information.
- **I can** carry out an investigation.
- Read aloud the "I can . . ." statement. Have the class say the "I can . . ." statements together. Then have students tell a partner what they can do. The "I can . . ." statements for this lesson reference the Science and Engineering Practices of obtaining and communicating information and carrying out an investigation.
- **ASK:**
  - What information can you obtain and communicate? *(Sample answer: I can obtain and communicate information about the weather.)*
  - What data can you collect as you carry out an investigation? *(Sample answer: I can collect data about the temperature inside and outside as I carry out an investigation.)*

THE LESSON IN ACTION: Lesson 1, Day 8 - Elaborate

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

Lesson Opening

Do Now:

- **ASK:**
  - How would you describe today's weather? Is the weather normal for the current season?

During the Lesson

Research, Investigate, and Communicate: Inquiry Activity- Wind Effects

- Students will answer the question "What are the effects of wind on different objects?" Students will observe that wind affects objects differently depending on how heavy the objects are.

Advanced Preparation:

- Set up the fan so all students have a clear view of the demonstration.
- Help students make a prediction for two of the objects.
    - Remind them that a prediction is a statement of what they expect to observe in the future.
- Tell them to record their predictions in their science notebook. Then have students explain their predictions based on previous observations.
- Demonstrate for the class the effects of the fan on each object.
- Students should draw their observations in their science notebook.
- **ASK**:
    - Why are some objects affected by wind and others are not? *(Sample answers: Wind blows light objects because they don't weigh much. Heavy objects do not move around in the wind.)*
    - How does changing wind speed change what happens to some materials? *(Sample answers: Higher wind speed moves some objects, such as the marker, that didn't move at lower wind speed.)*
    - Why do you think the wind speed makes a difference? *(Sample answers: Heavier objects need more wind to make them move. So higher wind speeds move heavier objects.)*

Lesson Closing

Talk About It:

- Have students share their observations and data with their classmates.
- **ASK**:
    - How do your observations compare to those of other students? *(Sample answer: We chose different objects, but people who chose the same objects observed the same effects.)*

Crosscutting Concepts: Patterns

- If this is the first time you have taught the Crosscutting Concept of patterns, help students understand that patterns occur when something happens in a predictable way. Explain that changes in wind speed caused predictable changes in the motion of the objects.
- **ASK:**
    - Were there any patterns in the data? Describe them. *(Sample answer: When the wind speed was faster, objects moved more.)*

THE LESSON IN ACTION: Lesson 1, Day 9 - Evaluate

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

Lesson Opening

Do Now:

- **ASK:**
    - Does wind speed make a difference? Explain how.

During the Lesson

Performance Task- Make a Weather Poster:

- Students will answer the question "What types of weather do thermometers and rain gauges describe?"
- Students will categorize types of weather by the tool used to describe them.
- They will cut out and glue pictures of different types of weather to show how different tools are used to describe weather.

Advanced Preparation:

- Obtain magazines and newspapers that show different types of weather conditions.

Make a Model:

- Help students write or copy the words Thermometer and Rain Gauge on the poster board.
    - Guide students in their search for pictures of weather. Encourage them to think about the types of weather that each tool can measure. Then help them find pictures that depict those types of weather.
    - Remind students to think about what each tool measures when they glue their pictures in the categories.

Talk About It:

- Have students share their posters with their classmates.
- **ASK**:
    - What types of weather did you and your classmates show for each weather tool? *(Sample answer: People chose different pictures, but many of the same types of weather were shown on the posters.)*

Lesson Closing

Essential Question - How do we measure and describe weather?

- Have students refer to the answer you recorded and see if and how their thinking has changed.
- Discuss and share their answers as a large group. Write a single sentence that captures students' thinking. Have students copy the sentence in their science notebook. Help students who may struggle with the writing task.

Science and Engineering Practices:

- **I did** *obtain information.*
- **I did** *communicate information.*
- **I did** *carry out an investigation.*
- Refer to the "I will . . ." and "I can . . ." statements. Read together as a class the "I did . . ." statements.

Lesson 1 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Lesson 2:	Describe Weather	Estimated Time: 8 days (45 minutes per day)

Brief Overview of Lesson:

- **Day 1 and 2:** Students will complete the **Page Keeley Science Probe -** *Weather Patterns.* This is intended to serve as a pre-assessment and uncover students' basic ideas about weather patterns and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *weather in different seasons* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will also be introduced to the **Career Connection** of a *Meteorologist* and answer questions in their notebook.
- **Day 3:** Students will play detective to find clues about the current season. Clues will vary depending on the time of year the activity is conducted and may include items such as fallen leaves in fall or new flowers in spring. Instead of actually going on a nature walk, the teacher could play a video simulation of a walk through the woods, for example, and ask students to draw clues of what they see in the video. The goal is for students to identify things that can be used to reveal the current season. The teacher will lead a class discussion by asking questions. The teacher should be looking for students to discern patterns in the day-to-day weather that are similar to the general weather of that season. *(**If planned far enough in advance, this lesson might be an opportunity for a field trip to a state park, for example and actually do take the students on a Nature Walk**)*
- **Day 4, 5, and 6:** Students will be introduced to the vocabulary that is covered in this lesson. Teacher will read-aloud an informative text, *Weather and Seasons.* The teacher will ask students what questions they still have about weather and seasons, leading a class discussion. Students will discuss the text with a partner and draw what they learned about in their science notebook**.** Students will use the **Digital Interactive -** *Seasons* to answer questions about the patterns of weather during the different seasons. Students will complete the **Inquiry Activity -** *Five-Day Forecast.* Students will answer questions and draw a picture of the weather during a five-day span *(Ideally, use a past forecast that includes detailed information about temperature, wind speed, and precipitation)* in their science notebook**.** Students will revisit the **Page Keeley Science Probe -** *Weather Patterns* and change or justify their previous answers.
- **Day 7:** Students will explore the digital interactive about seasons in other states and answer questions in their science notebook**.** Students will complete the **Inquiry Activity -** *Favorite Season.* Using data from the activity, the class will create a pictogram and interpret the data to answer questions about patterns in students' favorite seasons.
- **Day 8:** Students will complete the **Performance Task -** *Make a Seasons Foldable.* Students will demonstrate their understanding of the seasons and patterns by drawing and coloring four trees. The teacher will lead a class discussion about similarities and differences in the seasons. Students will watch a short video and revisit the **Essential Question -** ***What weather patterns do you observe in the seasons?*** Students will complete the *Lesson 2 - Weather Patterns* assessment.

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

- We experience weather every day, and we adjust our behavior and the way we dress to accommodate the changes in weather as they occur. Weather can be difficult to predict, but we can use seasons, historical data, and patterns to inform an educated guess about what type of weather will be coming. We can also use seasons and patterns to predict natural occurrences, such as possible hurricanes or tornadoes, plants starting to grow, or trees losing their leaves.
- Certain patterns of weather happen in certain seasons. In many places on Earth, the winter is more likely to have colder temperatures and precipitation in the form of snow and ice. In the spring in many places, there is more rainfall and temperatures that are warmer than winter but still cooler than the summer.

LESSON FOUNDATION

Assessed Standards for this lesson	Important content not included in the standards
ESS2.D: Weather and Climate • Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time.	• Asking questions and defining problems in grades K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested. • Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. • Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. • Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. • Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. Preschool: Observe and record weather (e.g., chart temperatures throughout the seasons or represent levels of wind by waving scarves outdoors).(5.4.3)
Focus Question for this Lesson	
What weather patterns do you observe in the seasons?	
Learning Intention	**Success Criteria**
I am learning to make observations and describe patterns in the weather.	*I can describe weather using their observations of patterns in day-to-day weather and the seasons.*
Assessment(s)	
• Page Keeley Science Probe - Weather Patterns (Lesson 2) • Performance Task - Make a Seasons Foldable (Lesson 2) • Weather Lesson 2 Test • CER Framework •	
Feedback (Peer to peer/student to teacher/teacher to student)	
• Rubrics • Student self-regulation or self-monitoring • Peer Evaluation • Lesson Trackers • Aggressive Monitoring	

- Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS
Anticipated Student Pre-Conceptions/Misconceptions
● Students may think that weather happens randomly and is not based on patterns. Help them understand that recognizing the pattern of the weather usually being cooler in the morning than in the afternoon and the pattern of the cycle of seasons along with using weather tools can help them predict weather conditions. Discussing and recording the weather each day will help students see the patterns in weather. Revisiting the observations you record over the school year will help students see the change in seasons and other weather patterns. ● Some students may have friends or family members living in different places in the country or in the Southern Hemisphere. They may be aware that different places in the country might experience different weather during the seasons or that the Northern and Southern Hemispheres experience opposite seasons.
Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

- 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.
- Plan for tiered learning

THE LESSON IN ACTION: Lesson 2, Day 1 and 2 - Assess and Engage

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

Lesson Opening

Do Now:

- **ASK:**
  - What is the weather normally like during this season?

During the Lesson

Assess Lesson Readiness: Page Keeley Science Probe: Weather Patterns

- Introduce the probe by asking students to share what they know about patterns. Tell them that three friends are talking about the weather.
  - One of the friends is describing a weather pattern.
  - Point to each character in the probe, say the character's name, and read what the character says to the students. Make sure students understand what each character is saying.
- Ask the students to choose the friend they think is describing a weather pattern. Make sure they focus on the characters' ideas and not the characters' looks, name, or other features they like the most.
  - Choose a talk configuration (pair, small group, whole class, or combination) and listen carefully as students share their thinking. Use talk moves to help students explain their thinking.

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 *weather in different seasons*.
- Play the video and ask students what questions they have about the weather they saw in each season.
- Read the text together.
  - 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 weather in the different seasons?
  - What did you wonder about what you saw in the video?
  - What interests you about the weather in the different seasons?
- 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 they generate right now. They will return to them later in the lesson. Record the class questions in a location that you can reference later.

STEM Career Kid Connection: Meteorologist

- Introduce Career Kid Hugo, who wants to be a meteorologist when he grows up. A meteorologist studies weather and weather conditions. Read to students what Hugo says in the speech bubble.
- **ASK:**

- Why would a meteorologist want to be able to see weather patterns? *(Sample answers: Patterns make predictions easier. Meteorologists predict the weather so people can prepare for it.)*

- Have students brainstorm patterns weather follows. Write their suggestions on the board. Show students the video. Ask students what they learned about Hugo.

Essential Question: What weather patterns do you observe in the seasons?

- Have students follow along as you read the Essential Question. Have them use prior knowledge and observations to try to answer the question. Remind students 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. Record students' answers, as well as their thoughts and questions about the Essential Question, on chart paper or the board so that you can reference them throughout the lesson.

Lesson Closing

Science and Engineering Practices:

- **I will** *interpret data.*
- **I will** *develop a model.*
- Have students follow along as you read aloud the "I will . . ." statements.
  - Throughout the lesson, students will interpret data and develop models to show patterns in the weather. If this is the first time you are teaching the Science and Engineering Practices of interpreting data and developing a model, explain that interpreting data means deciding what the data mean and that a model may be a variety of things, such as a drawing or diorama. Tell them that scientists use data to answer questions.
- **ASK:**
  - What questions could data help you answer about weather patterns? *(Sample answers: Which months are coldest? Which months are hottest? Which months have the most rain?)*

THE LESSON IN ACTION: Lesson 2, Day 3 - Explore

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

Lesson Opening

Do Now:

- **ASK:**
  - What types of patterns have you noticed about the seasons?

During the Lesson

Inquiry Activity- Nature Walk:

- Students will investigate their environment for clues about the current season.
- Students will play detective to find clues about the current season.
  - Clues will vary depending on the time of year the activity is conducted and may include items such as fallen leaves in fall or new flowers in spring.

Advanced Preparation:

- Point out that students just saw a video about weather in different seasons. Now they will investigate the season in your location. To add fun to the activity and help students feel like detectives, you may want to give students hand lenses.

- ***This Inquiry Activity presents an opportunity for a field trip to state park, for example, if planned well in advance***
- ***If an actual Nature Walk is not possible, look for a video of a walk through the woods or along the beach and have students identify clues about the season based on what they observe in the video***
- Help students frame the question they will answer on the nature walk.
    - Student questions should indicate they are trying to determine what season it is.
- Gather input from the class, and then write the question on the board.

Carry Out an Investigation:

- Have students draw the clues they will use to answer their question in their notebook. On the nature walk, have students look for clues about the season. Remind students not to touch the plants or animals they see. Plants can be poisonous, and wild animals can be dangerous. Record Data Have students draw their clues about the season in their science notebook**.**

Talk About It:

- Have students use the Talk About It questions to share and discuss their results.
- **ASK**:
    - How does day-to-day weather compare to the seasons? *(Sample answers: The weather each day is similar to the weather for the season. A day in summer is hot, like summer is hot.)*
    - How does knowing about the seasons help you prepare for the weather? *(Sample answer: Knowing which season it is helps me know how to dress and act. I know in summer I can wear shorts and go swimming, but I can't do that in winter.)*

- What you should observe in this discussion is your students' ability to discern patterns. Students should notice that weather for each day in a season is similar to weather for the season in general.
- **ASK**:
    - What patterns do you notice about weather in the seasons? *(Sample answers: Winter is the coldest. Spring is warmer than winter, and it is rainy. Summer is the hottest season, and it is dry. Fall is cooler than summer but not as cold as winter.)*

Lesson Closing

Differentiated Instruction:

- **Approaching Level**
    - Ask students to identify the four seasons. Review the seasons as needed.
- **On Level**
    - Divide students into four groups. Assign each group a season. Have groups create a poster with drawings that represent their assigned season.
- **Beyond Level**
    - Have students create four drawings, one for each season. Then have them create a cover page titled Seasons by [student's name]. Help students staple the cover page and drawings to create a book.

THE LESSON IN ACTION: Lesson 2, Day 4, 5, and 6 - Explain

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

Lesson Opening

Do Now:

- **ASK:**
  - What patterns did you notice about weather in the seasons?

During the Lesson

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 add the words to a word wall so students 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.
  - **patterns**- the repeated way in which something happens
  - **season**- time of year
  - **spring**- the season after winter
  - **summer**- the season after spring
  - **fall**- the season after summer
  - **winter**- the season after fall

Weather and Seasons Read Aloud:

- Read: *Weather and Seasons* in the **Science Paired Read Aloud**.
  - Please note that this is the remaining portion of the **Science Paired Read Aloud** that students began reading in Lesson 1. Students will learn about the seasons and the type of weather typical for each.
  - Before reading, have students ask questions they still have about seasons and weather patterns. The vocabulary words *season, spring, summer, fall,* and *winter* appear in this selection. As you read aloud the selection, use the questions to guide student comprehension.
- **ASK:**
  - What is your favorite season? Why? (Sample answer: summer, because I go swimming a lot.)
  - Which season has the least amount of daylight? (Sample answer: winter)

Crosscutting Concepts: Patterns

- If this is the first time you have taught the Crosscutting Concept of patterns, help students understand that patterns occur when something happens in a predictable, regular way. Have students talk with a partner about the pattern of the seasons and how the weather changes. Remind them to use the new vocabulary words as they talk. Then have them share their ideas in a class discussion.
- **ASK**:
  - How does the weather change with the seasons? *(Sample answer: It is warm in summer, cooler in fall, cold in winter, and then warmer in spring.)*
  - What pattern do the seasons form? *(Sample answer: If I start with spring, then the pattern is always spring, summer, fall, and then winter. After winter is spring again, and the pattern repeats.)*

Seasons Digital Interactive:

- Have students explore the digital interactive about the seasons. Read the slides aloud with students.
- **ASK**:
  - What season is the warmest? *(Sample answer: summer)*
  - What season is most likely to get lots of rain? *(Sample answer: spring)*
  - How do you know when fall happens? *(Sample answers: Leaves change color and fall off the trees. The air gets cooler.)*
  - What happens to most plants during winter? *(Sample answers: They don't grow. Some die.)*

- Guide students to discuss how the seasons compare to one another. Help them complete the activity in their science notebook.

Differentiated Instruction:

- In addition to the Digital Interactive, read aloud the leveled reader When Weather Changes. Pause after reading each sentence, and ask questions to assess students' understanding of the content. Rewording statements as questions is a simple way to find out what students understand.
    - **Emerging Level:** As needed, restate information from the reader using simple synonyms, short phrases, or single words. Ask yes/no and either/or questions, such as, Does this show winter? Is it hot or cold?
    - **Expanding Level:** After reading, ask students to turn to a partner and discuss the book's main ideas. Then ask volunteers to describe what the book was about.
    - **Bridging Level:** Pair Bridging students with Emerging students who share a home language. As you read and ask questions, have the Bridging students help the Emerging students express his or her ideas.

Inquiry Activity- Five-Day Forecast:

- Students will compare a current forecast with a forecast for a different season. Students will compare and contrast forecasts in different seasons and recognize patterns.

Advanced Preparation:

- If possible, obtain an old 5-day forecast from a different season. If using newspapers, bring in a newspaper with a 5-day forecast. Ideally, use a past forecast that includes detailed information about temperature, wind speed, and precipitation. If a past forecast cannot be obtained, search online for a future forecast.

Differentiated Instruction:

- Introduce or review verb tenses with students. Remind them that a verb tense describes the time when an action occurs. Provide a simple example, such as, I played yesterday. I am playing today. I will play tomorrow. As you say the sentences, emphasize the differences between played, laying, and will play.
    - **Emerging Level**: Review the meanings of yesterday/ past, today/present, and tomorrow/future by describing classroom events and identifying them in terms of time.
    - **Expanding Level:** Describe the weather using past, present, or future tense. Then ask, Am I talking about yesterday, today, or tomorrow? Have students answer based on the tense you use.
    - **Bridging Level:** Display an image of a rainy, snowy, or sunny day. Say either: Yesterday. Today. or Tomorrow. Have students describe the picture using the correct tense based on the time you specify.

Talk About It:

- Have students interpret their data.
- **ASK**:
    - How are the forecasts alike? *(Sample answer: They both include sunny days.)*
    - How are the forecasts different? *(Sample answer: The winter forecast is colder than the summer forecast.)*
- What you should observe in this discussion is your students' ability to discern patterns.
- Students should notice that weather for one season is similar from day to day and different from weather for another season.
- **ASK:**
    - Do you see any patterns? What are they? *(Sample answers: The winter temperatures are cold. The summer temperatures are hot.)*

Visual Kinesthetic Vocabulary:

- Have students cut out and fill in the Dinah Zike Visual Kinesthetic Vocabulary on pages VKV215–VKV216.

- Weather follows patterns in seasons, which are spring, summer, fall, and winter. For this lesson, students will use the VKVs for the terms patterns, season, spring, summer, winter, and fall.

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
- **ASK**:
  - How are the seasons alike and different?
- Complete the graphic organizer as a class, choosing two of the seasons to compare. If students were not able to compare and contrast the two seasons, then have them review Weather and Seasons in the Science Paired Read Aloud and revisit the digital interactive about the seasons.

Differentiated Instruction:

- **Approaching Level:** Assess students' ability to compare and contrast by having them describe how two similar classroom objects are alike and different.
- **On Level**: Ask students to compare and contrast today's weather with yesterday's weather.
- **Beyond Level:** Ask students to compare and contrast what they have learned about seasons with ways their local seasons are experienced.

Reflect and Refine- Weather Patterns

- 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 seasonal patterns in the weather. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

Lesson Closing

Science and Engineering Practices:

- **I can** *interpret data*.
- **I can** *develop a model.*
- Read aloud the "I can . . ." statements. Have the class say the "I can . . ." statements together. Then have students tell a partner what they can do. The "I can . . ." statements for this lesson reference the Science and Engineering Practices of interpreting data and developing a model.
- **ASK:**
  - What data can you interpret? *(Sample answer: I can compare and contrast data about different seasons.)*
  - What model can you develop? *(Sample answer: I can draw pictures to show the differences in the seasons.)*

THE LESSON IN ACTION: Lesson 2, Day 7 - Elaborate

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

Lesson Opening

Do Now:

- **ASK:**
  - How are the seasons alike and different?

During the Lesson

Research, Investigate, and Communicate: Seasons in Different Places

- Have students explore the digital interactive about seasons in other states. Describe the differences in climate in the North and South. Read the directions aloud with students.
- **ASK**:
  - What are the seasons like in the South? *(Sample answer: Summer is very hot and humid. Winter is mild.)*
  - What are the seasons like in the North? *(Sample answer: Summer is cooler and winter can be very cold.)*
- Have students trace the word North or South in their science notebook.

Inquiry Activity - Favorite Season:

- Students will use X marks to count the number of students who prefer each season.
- Students will name their favorite season and then use X marks to count how many students prefer each season.
- Start by having students draw a picture of their favorite season.
- Create a chart on the board or on a poster, listing each season.
  - Have each student tell the class their favorite season, and mark an X for that season on your chart.
  - Tell students to copy along, making X marks on their own charts. Use the X marks to draw a pictogram or bar graph on the board or chart paper.

Lesson Closing

Talk About It:

- Guide students to interpret the data shown on the graph or pictogram. Talk with them about the height of the bars or columns on the pictograph.
- **ASK**:
  - Which season is the favorite for the most number of students? *(Sample answer: summer)*
- Which season is the favorite of the least number of students? *(Sample answer: fall)*

Crosscutting Concepts- Patterns

- If this is the first time you have taught the Crosscutting Concept of patterns, help students understand that looking for similarities in the data can reveal patterns.
- **ASK**:
  - Were there any patterns in the favorite season data? *(Sample answer: Yes, most people liked warmer seasons better than others.)*

THE LESSON IN ACTION: Lesson 2, Day 8 - Evaluate

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

Lesson Opening

Do Now:

- **ASK:**
  - Which season was the favorite among your classmates? Why do you think that is?

During the Lesson

Performance Task - Make a Seasons Foldable:

- Students will model weather patterns in each season. Students will demonstrate their understanding of the seasons and patterns by drawing and coloring four trees. Show students how to fold a piece of paper into four rectangles and open it again. Help students label each rectangle with a different season. Guide students to draw pictures of a tree in each season within the four squares. Tell students to draw and color leaves on the trees and on the ground to represent each season.
- Read aloud the directions. Ask students if they have any questions about how to complete the activity.
- **ASK**:
    - How can a tree help show the seasons? *(Sample answer: A tree's leaves change in each season.)*

Talk About It:

- Guide students to discuss the similarities and differences among the seasons.
- **ASK:**
    - What is the same in each season? Student answers should match seasonal differences in your area. *(Sample answers: The tree, rocks, and soil are there in all seasons. Each season has weather that changes daily.)*
    - What is different in each season? Student answers should match seasonal differences in your area. *(Sample answers: The average temperatures are different in each season. Trees have leaves in spring and summer. Trees lose leaves in the fall, and they are bare in winter. Grass is green in summer, but it is brown in winter.)*

Essential Question: What weather patterns do you observe in the seasons?

- Have students watch the video and think about the answer they gave to this question originally. Refer to the answers you recorded to this question and see if and how students' thinking has changed. Discuss and share their answers as a large group. Write a single sentence that captures students' thinking. Have students copy the sentence in their science notebook**.** Help students who may struggle with the writing task.

Assessment

- Students will complete the *Lesson 2: Weather Patterns* assessment

Lesson Closing

Science and Engineering Practices:

- **I did** *interpret data*.
- **I did** *develop a model*.
- Refer to the "I will . . ." and "I can . . ." statements**.** Read together as a class the "I did . . ." statements.

Lesson 2 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Lesson 3:	Forecasting and Severe Weather	Estimated Time: 16 days (45 minutes per day)

Brief Overview of Lesson:

- **Day 1 and 2:** Students will complete the **Page Keeley Science Probe -** *Forecast.* This is intended to serve as a pre-assessment and uncover students' basic ideas about severe weather and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a thunderstorm* by watching a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Meteorologist* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *What does a weather forecast tell us about severe weather?*
- **Day 3 and 4:** Students will review their weather data from the activity *Weather Report* from Lesson 1 of this module. They will predict the next day's weather based on the collected data. On the following day, they will check the actual weather to see if their prediction was correct. Students will share their observations from the data with the class and answer questions. Teacher will read the **Science Paired Read Aloud -** *Storm Warnings* and students will answer questions about the text.
- **Day 5, 6, 7, 8, 9, and 10:** Students will be introduced to the vocabulary that is covered in this lesson. Students will revisit the types of weather and weather tools from Lesson 1, and review how the weather tools help meteorologists tell what the weather is going to be. Teacher will lead a class discussion to gauge what students have learned up to this point in the lesson. Students will watch a **Video -** *Kinds of Severe Weather* and answer questions. Teacher will read the nonfiction selection **Science Paired Read Aloud** - *Severe Weather* and students will explore the digital interactive about how meteorologists forecast weather. Students will revisit the **Page Keeley Science Probe -** *Forecast* and change or justify their previous answers.
- **Day 11 and 12:** Students will complete the **Digital Interactive -** *Types of Severe Weather*. Students will learn more about blizzards, hurricanes, tornadoes, and thunderstorms and answer questions. Students will complete the **Digital Interactive -** *Tools for Severe Weather*. Students will learn more about the tools meteorologists use to measure and describe severe weather and answer questions.
- **Day 13 and 14:** Students will play the role of TV weather reporters and make a video forecasting the next day's weather. *(**Consider asking students to bring costumes to wear in their roles as TV weather reporters.**)* Students will review the different types of severe weather, choose one that they want to report on, and develop a forecast like they've seen on television. Students will share their forecasts with the class, playing the role of television reporter. Students will revisit the **Essential Question -** *What does a weather forecast tell us about severe weather?*
- **Day 15 and 16:** Students will make a poster to explain how to prepare for the weather. Students will find pictures in magazines of weather and cut them out and then glue them on the poster to show kinds of weather and how to prepare for them. This poster should be used in the scenario with **Career Kid** *Poppy* to help her prepare for the park's birthday party. Students should find pictures that show weather conditions *Poppy* might expect and how to prepare for them. Encourage students to think about what it means that the weather has been rainy for the past few days. Students should think about weather patterns and forecasting while creating their posters.

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

- Many different tools are used to forecast, or predict, future weather. It is important for our safety to anticipate strong storms, freezing or blistering temperatures, or heavy rainfall.
- Weather can become severe. The word severe means "harsh or dangerous." Blizzards, tornadoes, hurricanes, and thunderstorms are all examples of severe weather. Meteorologists use technology to forecast severe weather, and people often have time to respond and make preparations. We spread salt on icy winter roads, build storm cellars, dig sewers to collect rainfall, and create emergency kits with water, flashlights, and batteries. Being prepared and paying attention to warnings can help lessen the damage caused during severe weather conditions.

<table>
<tr><th colspan="2">LESSON FOUNDATION</th></tr>
<tr><td>Assessed Standards for this lesson</td><td>Important content not included in the standards</td></tr>
<tr><td>ESS3.B: Natural Hazards
Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events.
ETS1.A: Defining and Delimiting an Engineering Problem
Asking questions, making observations, and gathering information are helpful in thinking about problems.</td><td>Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.
Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.</td></tr>
<tr><td colspan="2">Focus Question for this Lesson</td></tr>
<tr><td colspan="2">What does a weather forecast tell us about severe weather?</td></tr>
<tr><td>Learning Intention</td><td>Success Criteria</td></tr>
<tr><td>I am learning to describe severe weather and observe patterns that can help me forecast the weather.</td><td>I can ask questions and obtain information about severe weather in order to forecast the weather.</td></tr>
<tr><td colspan="2">Assessment(s)</td></tr>
<tr><td colspan="2">Page Keeley Science Probe - Forecast (Lesson 3)
Performance Task - Make a Video (Lesson 3)
Weather Lesson 3 Test
Weather Module Performance Project - Make a Weather Poster
Weather Performance Project - Make a Weather Poster Rubric</td></tr>
<tr><td colspan="2">Feedback (Peer to peer/student to teacher/teacher to student)</td></tr>
<tr><td colspan="2">Rubrics
Module Performance Project Rubric
Student self-regulation or self-monitoring
Peer Evaluation
Lesson Trackers
Aggressive Monitoring
Daily Checks for Understanding</td></tr>
</table>

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS
Anticipated Student Pre-Conceptions/Misconceptions
● Students may think that weather can be easily forecast. Even with the help of tools and technology, weather can still change suddenly and surprise us. Meteorologists base their forecasts on data and patterns, but they are not able to be accurate all of the time. ● An explanation of the science behind thunder can help to alleviate student concerns about this loud sound. The inside of clouds rubs together, producing a static electricity buildup, which is released as lightning. Lightning heats the air, which expands rapidly and pushes the air particles out. This sudden movement of air particles causes vibrations. The vibration of the air particles is the sound of thunder. Both events happen at the same time, but light travels much faster than sound, so we see lightning before we hear thunder. Only lightning can be dangerous, not thunder.
Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

- 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.
- Plan for tiered learning

THE LESSON IN ACTION: Lesson 3, Day 1 and 2 - Assess and Engage

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

Lesson Opening

Do Now:

- **ASK:**
  - What are some examples of severe weather? Have you ever experienced severe weather?

During the Lesson

Assess Lesson Readiness - Page Keeley Science Probe: Forecast

- This probe can be used as an elicitation prior to introducing a lesson on weather forecasting.
  - This concept cartoon 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 cartoon share their ideas, and students are asked to select whom they most agree with and explain why they agree. This format helps students recognize that people have different ideas about science and it is important to share these ideas.
- Introduce the probe by asking students if they have ever watched a weather person on TV. What does the weatherperson do? Tell students that one of the things a weather person does is to forecast the weather.
  - Tell students that three friends are talking about how a weatherperson forecasts the weather. They each have a different idea about what it means to forecast the weather. Point to each character in the probe, say the character's name, and read what each character says to the students.
  - Make sure students understand what each character is saying.
- Ask students to choose the friend they think has the best idea about what it means to forecast the weather.
  - Make sure students focus on the characters' ideas and not the characters' looks, name, or other features they like the most. Choose a talk configuration (pair, small group, whole class, or combination) and listen carefully as students share their thinking. Use talk moves to help students explain their thinking.

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 thunderstorm. Play the video and ask students what questions they have about the thunderstorm. 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 thunderstorm?
  - What did you wonder about what you saw in the video?
  - What interests you about the thunderstorm?

- 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 they generate right now. They will return to them later in the lesson. Record the class questions in a location that you can reference later.

STEM Career Kid Connection: Meteorologist

- Introduce Career Kid Hugo, who wants to be a meteorologist when he grows up. A meteorologist studies weather and weather conditions. Read to students what Hugo says in the speech bubble.
- **ASK:**
  - What does a meteorologist do when severe weather is coming? *(Sample answer: A meteorologist predicts severe weather and warns people about it so they can stay safe.)*
  - How is a meteorologist related to a weather forecast? *(Sample answer: Meteorologists make forecasts and share them so people can prepare for weather.)*
- Have students brainstorm different ways to prepare for severe weather. Write their suggestions on the board.

Differentiated Instruction:

- **Approaching Level**: Ask students to describe a time when the weather was very hot, very windy, very rainy, or very cold. Then explain that severe means "very strong."
- **On Level:** Describe a time when you expected something to happen, but something else happened instead. Ask students for their own examples. Point out that a prediction is an educated guess rather than a guarantee.
- **Beyond Level:** Ask students to explain how the saying "Better safe than sorry" applies to warnings about severe weather.

Essential Question: What does a weather forecast tell us about severe weather?

- Have students follow along as you 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.
- Record students' answers, as well as their thoughts and questions about the Essential Question, on chart paper or the board so that you can reference them throughout the lesson.

Lesson Closing

Science and Engineering Practices:

- **I will** *analyze data*.
- **I will** *communicate information*.
- Have students follow along as you read aloud the "I will . . ." statements. Throughout the lesson, students will analyze data and communicate information about forecasting severe weather. If this is the first time you are teaching the Science and Engineering Practice of analyzing data and communicating information, explain that data are observations or measurements and that scientists then communicate this information to others. Tell them that scientists use data to answer questions.
- **ASK**:
  - What data could you collect about severe weather? *(Sample answers: temperature, amount of rain, wind speed, what time of year it happens)*

THE LESSON IN ACTION: Lesson 3, Day 3 and 4 - Explore

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

Lesson Opening

Do Now:

- **ASK:**
  - How can a weather forecast help us when severe weather is coming?

During the Lesson

Inquiry Activity - Tomorrow's Weather:

- Students will predict the weather and then check their predictions. Students will review their weather data from the activity *Weather Report* from Lesson 1 of this module. They will predict tomorrow's weather based on the collected data. On the following day, they will check the actual weather to see if their prediction was correct.

Advanced Preparation:

- Point out that students just saw a thunderstorm. Now they will make a prediction about the weather.

Make a Prediction:

- Help students make a prediction for the following day's weather. Remind them that a prediction is a statement of what they expect to observe in the future.
- Tell them to record their predictions in their science notebook.
- Then have students explain their predictions based on previous observations.

Carry Out an Investigation: Record Data

- On the following day, students should record the weather in the morning, at noon, in the afternoon, and in the evening in their science notebook.
- Take time during class to have students record the daytime weather. Encourage students to work with their parents at home to record the weather in the evening.
- Students should compare their recorded data with their prediction to see if they were correct.

Talk About It:

- Have students share their observations and data with their classmates.
- **ASK**:
  - How did your prediction compare to predictions by other students? *(Sample answers: The predictions were very different. Some people predicted rain and others predicted sun.)*
  - How did your prediction compare to the weather? *(Sample answers: My prediction was pretty close. I thought it would rain, and there was rain in the afternoon.)*
  - Why did you make the prediction that you made? What evidence did you use? *(Sample answers: I used the data I recorded several days ago. I thought today would be about the same.)*
  - How is your prediction like a weather forecast? *(Sample answer: They both predict the weather in the future.)*
  - What could you do to make your prediction better? *(Sample answers: I could use data from other years for this day of the year. I could use a meteorologist's forecast to help me.)*

Additional Modifications/Accommodations

- Clarify the meaning of predict. Use construction paper to cut out 20 small green circles and 5 small red circles. Place all the circles in a hat or container. Be sure students know there are more green circles than red circles. Ask students to predict which color they will pull out of the container, using what they know.
  - **Emerging Level:** Allow students to use a single word—red or green—to make their predictions. Then have them evaluate their prediction afterward saying yes or no.

- **Expanding Level:** Provide sentence frames for students to use when making and evaluating their predictions: I predict. My prediction was.
- **Bridging Level:** Ask students to explain in their own words why their predictions are not wild guesses. Possible answer: There are more green circles, so I think I will pull out a green circle.

Storm Warning Read Aloud:

- Read: *Storm Warning* in the **Science Paired Read Aloud**. Students will read about Maisy's pool party that has to be moved indoors because of a storm. Before reading, have students tell you what they already know about storm warnings. As you read aloud the selection, use the questions to guide student comprehension.

Differentiated Instruction:

- **Approaching Level:** After reading Storm Warning, ask students to identify the severe weather—blizzard, hurricane, thunderstorm, or tornado—that drove the party indoors.
- **On Level:** After reading Storm Warning, ask students to imagine how the story would be different if the severe weather was a blizzard rather than a thunderstorm.
- **Beyond Level:** Ask students to draw a picture showing what they would do during a severe weather event.

Lesson Closing

- **ASK**:
  - Has the weather ever changed your plans? *(Answers will vary.)*
  - How did Maisy's mom know to plan for an indoor party? *(Sample answer: She saw the forecast.)*

THE LESSON IN ACTION: Lesson 3, Day 5, 6, 7, 8, 9, and 10 - Explain

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

Lesson Opening

Do Now:

- **ASK:**
  - Has the weather ever changed your plans? How could you have prevented that?

During the Lesson

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 slides, display the words and their definitions. You might want to add the words to a word wall so students 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.

forecast - say that something will happen by using information about the weather
severe weather - very strong conditions outside
hurricane - strong storm with heavy rain and winds that blow in a circle
blizzard- strong snowstorm that lasts a long time
thunderstorm - storm with thunder and lightning
tornado - a strong storm with winds that form a cloud that looks like a funnel

Tornado Warning: Video

- Revisit the types of weather and weather tools from Lesson 1. Review how the weather tools help meteorologists tell what the weather is going to be. Have students watch the video *Tornado Warning*. This video shows preparation for a tornado.
- **ASK**:
  - What other tools do meteorologists use to forecast severe weather? *(Sample answer: radar)*
  - What tools do they use to warn us of severe weather? *(Sample answer: sirens and forecast on radio)*
- Have students circle their answers to these questions in their science notebook.

Develop Vocabulary:

- **forecast:** Point out to students that the word forecast is actually two words together. Fore means "at the front" or "earlier," and one meaning of cast is "to send in the direction of someone." *Prediction* is a synonym for *forecast*.

Visual Kinesthetic Vocabulary:

- Have students cut out and fill in the Dinah Zike Visual Kinesthetic Vocabulary from pages VKV217–VKV218. A forecast tells people what weather to expect. For this lesson, students will use the VKV for the term forecast. Instruct students to cut the card out on the dotted lines and fold it along the solid lines. Help students read the word forecast. If they have trouble, demonstrate how to cover up letters and read it as two words. Help students find the definition of the word and either read the definition aloud to them or have them read it to a classmate.

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 forecasts and severe weather, have them revisit the **Science Paired Read Aloud** and the digital interactive.
- **ASK:**
  - How does a forecast help you prepare for severe weather? *(Sample answer: A forecast tells you what kind of weather will happen so you can stay safe.)*

Kinds of Severe Weather Video:

- Have students watch the video Kinds of Severe Weather. This video shows different types of severe weather.
- **ASK**:
  - What type of severe weather happens mostly in winter? *(Sample answer: a blizzard)*
  - What type of severe weather happens when it rains a lot for many days? *(Sample answer: a flood)*
  - Why should you be careful if you hear that severe weather is coming? *(Sample answer: Severe weather can be dangerous, so you need to prepare for it.)*

Severe Weather Read Aloud:

- Read the nonfiction selection *Severe Weather* in the **Science Paired Read Aloud**.
  - Please note that this is not the entire nonfiction selection. Students will learn what severe weather is and what a forecast is.
  - Before reading, have students tell you what they already know about severe weather and forecasts.
- Have students ask questions they still have about severe weather and forecasts.
  - The vocabulary terms severe weather and forecast appear in this selection. As you read aloud the selection, use the questions to guide student comprehension.
- **ASK**:
  - What is severe weather? *(Sample answer: Severe weather is when there is too much rain, wind, or snow.)*
  - What is a forecast? *(Sample answer: A forecast is a prediction about future weather made by a weather reporter.)*

Talk About It: Have students discuss with a partner the question about severe weather**.**

Severe Weather Read Aloud:

- Read the nonfiction selection *Severe Weather* in the **Science Paired Read Aloud**.
    - Please note that this is not the entire nonfiction selection. Students will learn about tornadoes and hurricanes.
    - Before reading, have students tell you what they already know about tornadoes and hurricanes.
- Have students ask new questions they still have about tornadoes and hurricanes.
    - The vocabulary words tornado and hurricane appear in this selection. As you read aloud the selection, use the questions to guide student comprehension.
- **ASK:**
    - What is a tornado? *(Sample answer: A tornado is a powerful storm in which the winds move in a circle.)*
    - Where does a hurricane form? *(Sample answer: over water)*

Severe Weather Read Aloud:

- Read the nonfiction selection *Severe Weather* in the Science Paired Read Aloud.
    - Please note that this is not the entire nonfiction selection. Students will learn about thunderstorms and rainy conditions.
    - Before reading, have students tell you what they already know about thunderstorms.
- Have students ask new questions they still have about thunderstorms.
    - The vocabulary word thunderstorm appears in this selection. As you read aloud the selection, use the questions to guide student comprehension.
- **ASK**:
    - What is a thunderstorm? *(Sample answer: A thunderstorm is a storm with thunder, lightning, rain, and wind.)*
    - What sometimes happens when it rains hard for a long time? *(Sample answer: a flood)*
    - How does a meteorologist help people prepare for rain? *(Sample answer: People stay out of creeks and rivers if they know there is flooding.)*
- Have students answer the question about preparation for rainy conditions.

Severe Weather Read Aloud:

- Read the nonfiction selection Severe Weather in the **Science Paired Read Aloud**.
    - Please note that this is not the entire nonfiction selection. Students will learn about blizzards.
    - Before reading, have students tell you what they already know about blizzards.
- Have students ask new questions they still have about blizzards.
    - The vocabulary word blizzard appears in this selection. As you read aloud the selection, use the questions to guide student comprehension.
- **ASK**:
    - What is a blizzard? *(Sample answer: A blizzard is a strong snowstorm that goes on for a long time.)*
    - How does a meteorologist help people prepare for a blizzard? *(Sample answer: A meteorologist tells people when a blizzard is coming so they can stay off the roads.)*
- Have students answer the question about preparation for snowy conditions.

Forecasting Weather Digital Interactive:

- Have students explore the digital interactive about how meteorologists forecast weather.
- **ASK:**

- What tools do meteorologists use to forecast snow and rain? *(Sample answer: radar maps)*
- What tools do meteorologists use to study hurricanes? *(Sample answer: satellites)*

- Have students complete the activity in their science 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
- **ASK**:
  - What are the effects of severe weather?
- Complete the graphic organizer as a class. If students were not able to determine the effects of severe weather, have them review *Severe Weather* in the **Science Paired Read Aloud**.

Reflect and Refine: Forecast

- 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 forecasting and severe weather. Revisiting the probe here will reveal whether students are still holding on to a misconception or have gaps in conceptual understanding.

Lesson Closing

Science and Engineering Practices:

- **I can** *analyze data.*
- **I can** *communicate information.*
- Read aloud the "I can . . ." statements. Have the class say the "I can . . ." statements together. Then have students tell a partner what they can do. The "I can . . ." statements for this lesson reference the Science and Engineering Practices of analyzing data and communicating information.
- **ASK:**
  - What data can you analyze? *(Sample answer: I can compare different types of severe weather.)*
  - What information can you communicate? *(Sample answer: I can communicate information about thunderstorms.)*

THE LESSON IN ACTION: Lesson 3, Day 11 and 12 - Elaborate

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

Lesson Opening

Do Now:

- **ASK:**
  - What are the effects of severe weather?

During the Lesson

Research, Investigate, and Communicate: Types of Severe Weather

- Have students complete the *Types of Severe Weather* **Digital Interactive**.
  - Students will learn more about blizzards, hurricanes, tornadoes, and thunderstorms.
- **ASK:**
  - How are tornadoes and hurricanes alike? How are they different? *(Sample answers: They are alike because they have strong winds. They are different because hurricanes happen over water and tornadoes happen over land.)*

- Which severe weather occurs in winter? *(Sample answer: blizzard)*

- Have students complete the activity in the **Science Notebook.**

Tools for Severe Weather Digital Interactive:

- Have students complete the Tools for Severe Weather Digital Interactive. Students will learn more about the tools meteorologists use to measure and describe severe weather.
- **ASK**:
  - How does a radar map help during severe weather? *(Sample answer: Meteorologists use radar maps to show and predict severe weather like thunderstorms and blizzards.)*
  - Which tools can be used to describe and measure? *(Sample answer: satellites, radar)*
  - What tools can we keep at home to help us during severe weather? *(Sample answers: flashlights, batteries, canned food, bottled water, radio)*

Lesson Closing

- Have students complete the activity in the **Science Notebook**.

THE LESSON IN ACTION: Lesson 3, Day 13 and 14 - Evaluate

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

Lesson Opening

Do Now:

- **ASK:**
  - How are tornadoes and hurricanes similar? How are they different?

During the Lesson

Performance Task: Make a Video **(This performance task is split between two days to ensure all students participate)**

- Students will play the role of TV weather reporters and make a video forecasting the next day's weather.
  - Students will choose one type of severe weather and create a forecast for the next day, describing what the weather will be like and how people should prepare for it.

Advanced Preparation:

- Consider asking students to bring costumes to wear in their roles as TV weather reporters.

Communicate Information:

- Explain to students that making a video is one way to share, or communicate, information.
  - Guide students to review the types of severe weather: hurricane, thunderstorm, tornado, and blizzard. Have students choose from the different types of severe weather from the digital interactive.
  - Make sure the groups choose different types of severe weather so that all types are shown in the videos. Help students develop a forecast like the ones seen on television.
- Set up the camera and record students as they deliver their forecasts.
- Allow students to deliver the forecasts in any manner that makes sense.
  - Encourage their creativity. Ensure students cover the type of weather, when it will happen, what people can expect, and how they can prepare for it. Allow students to be creative in their delivery.

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 one thing can cause another to happen. For example, too much rain can cause flooding.
- **ASK**:
  - What happens to trees when it is windy? *(Sample answer: The wind blows the trees and can knock them over.)*
  - What happens when it snows for a long time? *(Sample answer: The snow can get very deep if it snows for a long time.)*
  - What causes a thunderstorm to be severe? *(Sample answer: lightning and heavy rain)*
- Help students use what they learned to match the pictures in the **Science Notebook.**

Talk About It:

- Have students share their forecasts with the class, playing the role of a TV weather reporter. Have students explain how they came up with their forecast and preparation advice.
- **ASK:**
  - How does your forecast help people prepare for the weather condition? *(Sample answer: The forecast is for a blizzard. It helps people know to stay off the roads.)*
  - What can you do if you see a forecast like this one? *(Sample answer: I can be sure I stay home if the roads aren't clear. I can check whether my family has food, flashlights, batteries, and a radio.)*
  - Why should you always check the forecast each day? *(Sample answer: The forecast lets you know if there is any severe weather approaching. Preparing for severe weather keeps you safe.)*

Essential Question: What does a weather forecast tell us about severe weather?

- Have students watch the video and think about the answer they gave to this question originally. Have students refer to the answer you recorded to this question in the **Science Notebook** and see if and how their thinking has changed.
- Discuss and share their answers as a large group.
- Write a single sentence that captures students' thinking. Have students copy the sentence in the **Science Notebook**. Help students who may struggle with the writing task.

Assessment:

- Students will complete the *Lesson 3: Forecasting and Severe Weather* assessment

Lesson Closing

Science and Engineering Practices:

- **I did** *analyze data*.
- **I did** *communicate information*.
- Refer to the "I will . . ." and "I can . . ." statements in the **Science Notebook**. Read together as a class the "I did . . ." statements in the **Science Notebook**.

THE LESSON IN ACTION: Lesson 3, Day 15 and 16 - Module Performance Project

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

Lesson Opening

Do Now:

- **ASK:**
  - What does a weather forecast tell us about severe weather? Why is that important?

During the Lesson

Module Wrap-Up- Performance Project ● Create Weather Poster ● Students will create a poster to communicate the forecast for severe weather to park patrons and help them prepare for weather conditions. ○ They must apply knowledge of describing weather conditions from Lesson 1, weather patterns from Lesson 2, and forecasting and severe weather from Lesson 3 to complete their poster. ● Students will present their Weather Posters to the class and answer questions about their projects
Lesson Closing
● Why is it so important to understand severe weather and how weather forecasts can help us to stay safe during severe weather?

Lesson 3 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Module 5:
Impacts on Earth's Systems

Stage 1 – Desired Results

ASSESSED FOCUS STANDARDS:
ESS2.E: Biogeology

- Plants and animals can change their environment. (KESS2-2)

CONTENT CONNECTIONS:
ELA/Literacy

- **R.K.1:** With prompting and support, ask and answer questions about key details in a text.

Mathematics

- **MP.2:** Reason abstractly and quantitatively.
- **MP.4:** Model with mathematics.
- **K.CC.A:** Know number names and the count sequence.
- **K.MD.A.1:** Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
- **K.MD.B.3:** Classify objects into given categories; count the number of objects in each category and sort the categories by count.

Unit Description

Anchoring Phenomenon: An animal building a home.
Statement: Living things change their environments.
Observation/Demonstration/Experience: Observe a video of an animal building its home.

Driving Question: How do animals, plants and humans change the environment?

Meaning

ENDURING UNDERSTANDINGS:

- Plants need sunlight, air, and water to make their own food through photosynthesis.
- Plants can change their environment.
- Plants grow toward sunlight.
- Animals can make changes to the environment around them. Some of these changes are beneficial to the environment, some of these changes are harmful, and some

ESSENTIAL QUESTIONS:

- How do animals change the environment?
- How do plants change the environment?
- How do humans change the environment?

	changes neither benefit nor harm the environment.	
	What students will know and be able to do	
	KNOWLEDGE: ● Students will engage in argument from evidence to explain how plants change their environment. (Lesson 1) ● Students will engage in argument from evidence to explain how animals change their environment. (Lesson 2) ● Students will engage in argument from evidence to explain how people change their environment. (Lesson 3)	**SKILLS:** ● **K-ESS2-1:** Use and share observations of local weather conditions to describe patterns over time. ○ [Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] ○ Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. ○ Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. ● **K-ESS2-2:** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. ○ [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.] ○ Construct an argument with evidence to support a claim. ○ Systems in the natural and designed world have parts that work together.

Stage 2 – Evidence

SUMMATIVE ASSESSMENT(S)

- Performance Task - Plant Poster (Lesson 1)
- Impacts On Earth's Systems Lesson 1 Test
- Performance Task - Beaver Dam (Lesson 2)
- Impacts On Earth's Systems Lesson 2 Test
- Performance Task - Plan a Garden (Lesson 3)
- Impacts On Earth's Systems Lesson 3 Test
- Impacts On Earth's Systems Module Performance Project - Create a Poster
  - Impacts On Earth's Systems Module Performance Project Rubric - Create a Poster
- Impacts on Earth's Systems Module Test
- STEM Gauge #466814
- STEM Gauge #472957

PRE-ASSESSMENT

- Page Keeley Science Probe - Plants and the Environment (Lesson 1)
- Page Keeley Science Probe - Animals and the Environment (Lesson 2)
- Page Keeley Science Probe - People and the Environment (Lesson 3)

Integration of 21st Century Skills

- **9.1.4.A.1:** Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.
- **9.1.4.A.2:** Evaluate available resources that can assist in solving problems.
- **9.1.4.A.3:** Determine when the use of technology is appropriate to solve problems.
- **9.1.4.A.4:** Use data accessed on the Web to inform solutions to problems and the decision-making process.
- **9.1.4.A.5:** Apply critical thinking
- **9.1.4.B.1:** Participate in brainstorming sessions to seek information, ideas, and strategies that foster creative thinking.
- **9.1.4.D.1:** Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
- **9.1.4.E.2:** Demonstrate effective communication using digital media during classroom activities.

Integration of Technology

- **Inspire Science Videos**
  - Beaver Building a Dam
  - Finn: Construction Manager
  - Kayla: Landscape Architect
  - Changing Environments
  - Chloe: Carpenter
  - Animals Changing Environments
  - Treehouse
  - People Changing Environments
- **Inspire Science Digital Interactives**
  - Sidewalk Crack
  - Plants Clean the Air
  - Moles Change Their Environment
  - Animals Help Plants
  - Humans Change Environments
- **Inspire Science Songs**
  - Plants We Eat
- **Discovery Education**
  - Impacts On Earth's Systems
- **Generation Genius**
  - Reducing Our Impact On Earth
- **Google Classroom Virtual Assignments**

Career Education

- **Construction Manager**
  - Construction managers oversee construction of buildings.
- **Landscape Architect**
  - A landscape architect designs and builds outdoor spaces.
- **Carpenter**
  - A carpenter builds things with wood.

• **9.3.4.A.2:** Identify various life roles and civic and work-related activities in the school, home, and community. • **9.3.4.A.3:** Appraise personal likes and dislikes and identify careers that might be suited to personal likes. • **9.3.4.A.4:** Identify qualifications needed to pursue traditional and nontraditional careers and occupations. • **9.3.4.A.5:** Locate career information using a variety of resources.	• **Bill Nye "Impacts On Earth's Systems" Videos** ○ Pollution Solution • **Crash Course Kids** ○ Impacts On Earth's Systems	

Stage 3 – Learning Plan

UNIT VOCABULARY

• burrow • farm	• dam • garden	• environment • need

SUMMARY OF KEY LEARNING

Lesson 1: Plants Change Environments

Lesson 1: Day 1 - Plants Change Environments - Module Opener

- **Learning Intention:** I am learning that living things change their environments to meet their needs.
- **Success Criteria:** I can make initial explanations by observing a video of an animal building its home.
- **Brief Overview of Lesson:** Students will be introduced to the phenomenon of an animal building its home. Students will ask questions about the video of the phenomenon and answer questions from the teacher. Students will be introduced to key vocabulary for the *Impacts On Earth's Systems* module. Students will examine the **STEM Career Kid Connection** of a Construction Manager.

Lesson 1: Day 2 and 3 - Plants Change Environments - Assess and Engage

- **Learning Intention:** I am learning that plants change the environment. I am learning about the phenomenon of a tree breaking the sidewalk.
- **Success Criteria:** I can choose the friend that I think has the best idea about plants changing the environment by completing the Page Keeley Science Probe. I can make initial explanations of the phenomenon by observing a tree breaking sidewalk.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Plants and the Environment.* This is intended to serve as a pre-assessment and uncover students' basic ideas about how plants impact the environment and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a tree breaking the sidewalk* by observing a photo. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Landscape Architect* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How do plants change the environment?*

Lesson 1: Day 4 and 5 - Plants Change Environments - Explore

- **Learning Intention:** I am learning that plants can impact their environment.
- **Success Criteria:** I can answer the question "What happens to a rock when a tree grows nearby?" by working in groups to create a model.
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Tree vs. Rock* by building a model tree with a rock next to it. They will then add clay to their tree to show it growing. The tree will move or break the rock. Students will make a prediction, carry out an investigation,

make observations and record data. The teacher will use a **Talk About It** question to assess student learning, and students will answer questions about their investigation. The teacher will read the **Science Paired Read Aloud -** *Changes Around Town* and students will answer questions about the text.

Lesson 1: Day 6 and 7 - Plants Change Environments - Explain

- **Learning Intention:** I am learning that plants and animals can change their environment.
- **Success Criteria:** I can answer questions about the text, *Changes Around Town*. I can observe the many changes that happen to the Earth along with their causes by watching the video, *Changing Environments.*
- **Brief Overview of Lesson:** Students will be introduced to key vocabulary words that will be used throughout the lesson. The teacher will read the **Science Paired Read Aloud -** *Plants and Animals Change Their Environments*. Students will answer questions about the text and draw their observations. Students will watch the *Changing Environments* video and answer questions. Students will complete the **Digital Interactive -** *Sidewalk Crack*, answer questions and complete an activity. Students will revisit the **Page Keeley Science Probe -** *Plants and the Environment* to justify or change their initial response.

Lesson 1: Day 8 - Plants Change Environments - Elaborate

- **Learning Intention:** I am learning that plants change the air.
- **Success Criteria:** I can explain how plants change the air by exploring the *Plants Clean the Air* Digital Interactive.
- **Brief Overview of Lesson:** Students will complete the **Digital Interactive -** *Plants Clean the Air* to learn how plants change the air. Students will make a prediction, carry out an investigation, make observations, and record data. Students will share their observations and answer questions about the investigation. Students will complete a circling activity in their notebooks.

Lesson 1: Day 9 - Plants Change Environments - Evaluate

- **Learning Intention:** I am learning that plants change the environment.
- **Success Criteria:** I can show an environment before and after a plant changes it by creating a poster.
- **Brief Overview of Lesson:** Students will complete the **Performance Task -** *Plant Poster* to show an environment before and after plants change it. Students will complete the Lesson 1 assessment.

Lesson 2: Animals Change Environments

Lesson 2: Day 1 and 2 - Animals Change Environments - Assess and Engage

- **Learning Intention:** I am learning that plants can change the environment. I am learning about the phenomenon of a prairie dog living in a burrow.
- **Success Criteria:** I can choose the friend I think has the best idea about organisms that can change the environment by completing the Page Keeley Science Probe. I can make initial explanations by observing a prairie dog in its burrow.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Animals and the Environment.* This is intended to serve as a pre-assessment and uncover students' basic ideas about how animals impact the environment and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a prairie dog living in a burrow* by observing a photo. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Carpenter* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How do animals change the environment?*

Lesson 2: Day 3 and 4 - Animals Change Environments - Explore

- **Learning Intention:** I am learning that animals burrow.

- **Success Criteria:** I can record my observations about the ways the ant farm changes. I can describe how animals change environments, fast and slow.
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Ant Farm* to answer the question, "How do ants change their environment?" Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning. The teacher will read the **Science Paired Read Aloud -** *Bitsy the Beaver.* Students will complete the **Inquiry Activity -** *Moles Change Their Environment.*

Lesson 2: Day 5 and 6 - Animals Change Environments - Explain

- **Learning Intention:** I am learning that animals change their environment.
- **Success Criteria:** I can discuss and develop key vocabulary by completing Dinah Zike Visual Vocabulary cards.
- **Brief Overview of Lesson:** Students will be introduced to key vocabulary words that will be used throughout the lesson. The teacher will read the **Science Paired Read Aloud -** *Animals Change Their Environments*. Students will answer questions about the text and complete an activity. Students will watch the *Animals Changing Environments* video and answer questions. Students will complete the **Digital Interactive -** *Animals Help Plants,* answer questions and complete an activity. Students will revisit the **Page Keeley Science Probe -** *Animals and the Environment* to justify or change their initial response.

Lesson 2: Day 7 - Animals Change Environments - Elaborate

- **Learning Intention:** I am learning that animals can be annoying to humans and the environment.
- **Success Criteria:** I can think of ideas to make changes to animals that annoy humans.
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Annoying Animals.* Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning.

Lesson 2: Day 8 - Animals Change Environments - Evaluate

- **Learning Intention:** I am learning that animals can change their environment.
- **Success Criteria:** I can show changes to a river and discuss my observations with a partner by building a model of a beaver dam.
- **Brief Overview of Lesson:** Students will complete the **Performance Task -** *Beaver Dam* to show changes to a river. Students will complete the Lesson 2 assessment.

Lesson 3: People Change Environments

Lesson 3: Day 1 and 2 - People Change Environments - Assess and Engage

- **Learning Intention:** I am learning that humans can change the environment**.** I am learning about the phenomenon of a family building a treehouse.
- **Success Criteria:** I can choose the friend that I think has the best idea about how people can change the environment by completing the Page Keeley Science Probe. I can make initial explanations by observing a video of a family building a treehouse.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *People and the Environment.* This is intended to serve as a pre-assessment and uncover students' basic ideas about how people impact the environment and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a family building a treehouse* by observing a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Landscape Architect* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How do humans change the environment?*

Lesson 3: Day 3 - People Change Environments - Explore

- **Learning Intention:** I am learning that humans can change an environment.
- **Success Criteria:** I can compare the area around my school to photographs or maps of the area from years ago by completing the Inquiry Activity, *School Changes*.
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *School Changes* to answer the question, "How have people changed the environment around my school?" Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning.

Lesson 3: Day 4, 5, 6, and 7 - People Change Environments - Explain

- **Learning Intention:** I am learning that people can make both good and bad changes to the environment.
- **Success Criteria:** I can explain how humans can make both good and bad changes to the environment by completing the Inquiry Activity, *Environment Changes*. I can explain how humans can make both good and bad changes to the environment by completing the Inquiry Activity, *Environment Changes*.
- **Brief Overview of Lesson:** Students will be introduced to key vocabulary words that will be used throughout the lesson. Students will watch the video Students will answer questions about the text and complete an activity. Students will watch the *Animals Changing Environments* video and answer questions. Students will complete the **Digital Interactive -** *Animals Help Plants*, answer questions and complete an activity. Students will revisit the **Page Keeley Science Probe -** *Animals and the Environment* to justify or change their initial response.

Lesson 3: Day 8 - People Change Environments - Elaborate

- **Learning Intention:** I am learning that humans find food in their environment.
- **Success Criteria:** I can discuss how humans find food in their environment by listening to the Science File, *How Humans Find Food in Their Environment.*
- **Brief Overview of Lesson:** The teacher will read the **Science File** *How Humans Find Food in Their Environment*. Students will make a list of foods they recently ate and answer questions from the teacher. Students will discuss where their food comes from and then complete a drawing activity.

Lesson 3: Day 9 - People Change Environments - Evaluate

- **Learning Intention:** I am learning that people change their environment.
- **Success Criteria:** I can plan and design a garden (flower or vegetable) to grow at school by drawing a class design.
- **Brief Overview of Lesson:** Students will complete the **Performance Task -** *Plan a Garden*. Students will define a problem and make a model. The teacher will use a **Talk About It** question to assess student understanding. Students will revisit the **Essential Question -** *How do humans change the environment?* Students will complete the Lesson 3 assessment.

Lesson 3: Day 10 - People Change Environments - Module Wrap-Up

- **Learning Intention:** I am learning that plants and animals can change the environment.
- **Success Criteria:** I can apply knowledge of how plants, animals and people change environments by creating a poster showing environments before and after they have been changed by plants, animals, and people.
- **Brief Overview of Lesson:** Students will complete the **Performance Project -** *Create a Poster* to show changes to a river. Students will complete the Impacts on Earth's Surfaces Module assessment.

CULTURALLY RESPONSIVE TEACHING in PRACTICE	SOCIAL EMOTIONAL LEARNING in PRACTICE
• Search for famous scientists in the field of ecology, biology, botany, etc. • Search for current events related to pollution, global warming, and endangered species, and any other way that environments can be changed.	• Responsible Decision-Making ○ Making ethical, constructive choices about personal and social behavior • Relationship Skills

● Try to find examples of a Construction Manager, Landscape Architect, and Carpenter.	○ Forming positive relationships, working in teams, dealing effectively with conflict

Lesson 1:	**Plants Change Environments**	**Estimated Time: 9 days (45 minutes per day)**

Brief Overview of Lesson:

- **Day 1:** Students will be introduced to the phenomenon of an animal building its home. Students will ask questions about the video of the phenomenon and answer questions from the teacher. Students will be introduced to key vocabulary for the *Impacts On Earth's Systems* module. Students will examine the **STEM Career Kid Connection** of a Construction Manager.
- **Day 2 and 3:** Students will complete the **Page Keeley Science Probe - *Plants and the Environment.*** This is intended to serve as a pre-assessment and uncover students' basic ideas about how plants impact the environment and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a tree breaking the sidewalk* by observing a photo. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Landscape Architect* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How do plants change the environment?*
- **Day 4 and 5:** Students will complete the **Inquiry Activity -** *Tree vs. Rock* by building a model tree with a rock next to it. They will then add clay to their tree to show it growing. The tree will move or break the rock. Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning, and students will answer questions about their investigation. The teacher will read the **Science Paired Read Aloud -** *Changes Around Town* and students will answer questions about the text.
- **Day 6 and 7:** Students will be introduced to key vocabulary words that will be used throughout the lesson. The teacher will read the **Science Paired Read Aloud -** *Plants and Animals Change Their Environments*. Students will answer questions about the text and draw their observations. Students will watch the *Changing Environments* video and answer questions. Students will complete the **Digital Interactive -** *Sidewalk Crack*, answer questions and complete an activity. Students will revisit the **Page Keeley Science Probe -** *Plants and the Environment* to justify or change their initial response.
- **Day 8:** Students will complete the **Digital Interactive -** *Plants Clean the Air* to learn how plants change the air. Students will make a prediction, carry out an investigation, make observations, and record data. Students will share their observations and answer questions about the investigation. Students will complete a circling activity in their notebooks.
- **Day 9:** Students will complete the **Performance Task -** *Plant Poster* to show an environment before and after plants change it. Students will complete the Lesson 1 assessment.

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

- Plants have needs they must meet to survive. They need sunlight, air, and water to make their own food through photosynthesis. Most plants also need nutrients from soil. Plants also need space to grow. As plants grow, they need greater quantities of all of these things.
- Sometimes, in order to meet their needs, plants change their environment. Plants can change the direction they grow. Plants grow toward sunlight. Roots may grow around or even through objects, breaking them if necessary.
- As plants change their own environment in an effort to meet their needs, plants can change the environment for other living and nonliving things, too. Tree roots can push or break pavement or underground pipes. Roots can also form areas of protection for animals to use as shelter. Tree

branches can cover large areas as they grow to ensure that their leaves get sunlight. This can block the sunlight from shining below the tree, and create shady spots. This shade is good for protection from sunlight for some living things, such as animals, insects, and people, but it can also stop the growth of other plants by preventing sunlight from reaching them.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
ESS2.E: Biogeology ● Plants and animals can change their environment. (KESS2-2)	**Analyzing and Interpreting Data** ● Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. **Engaging in Argument from Evidence** ● Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).

Focus Question for this Lesson

How do plants change the environment?

Learning Intention	**Success Criteria**
I am learning how plants change their environment.	*I can engage in argument from evidence to explain how plants change their environment.*

Assessment(s)

- Page Keeley Science Probe - Plants and the Environment (Lesson 1)
- Performance Task - Plant Poster (Lesson 1)
- Impacts On Earth's Systems Lesson 1 Test

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

- Rubrics
- Student self-regulation or self-monitoring
- Peer Evaluation
- Lesson Trackers
- Aggressive Monitoring
- Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Students may think plants use their roots to collect food, rather than making their own food through photosynthesis. Roots collect water and nutrients from the soil.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

- 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.

- Plan for tiered learning

Lesson 1 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Lesson 2:	**Animals Change Environments**	**Estimated Time: 8 days (45 minutes per day)**

Brief Overview of Lesson:

- **Day 1:** Students will complete the **Page Keeley Science Probe -** *Animals and the Environment.* This is intended to serve as a pre-assessment and uncover students' basic ideas about how animals impact the environment and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a prairie dog living in a burrow* by observing a photo. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Carpenter* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How do animals change the environment?*
- **Day 3 and 4:** Students will complete the **Inquiry Activity -** *Ant Farm* to answer the question, "How do ants change their environment?" Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning. The teacher will read the **Science Paired Read Aloud -** *Bitsy the Beaver.* Students will complete the **Inquiry Activity -** *Moles Change Their Environment.*
- **Day 5 and 6:** Students will be introduced to key vocabulary words that will be used throughout the lesson. The teacher will read the **Science Paired Read Aloud -** *Animals Change Their Environments*. Students will answer questions about the text and complete an activity. Students will watch the *Animals Changing Environments* video and answer questions. Students will complete the **Digital Interactive -** *Animals Help Plants*, answer questions and complete an activity. Students will revisit the **Page Keeley Science Probe -** *Animals and the Environment* to justify or change their initial response.
- **Day 7:** Students will complete the **Inquiry Activity -** *Annoying Animals.* Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning.
- **Day 8:** Students will complete the **Performance Task -** *Beaver Dam* to show changes to a river. Students will complete the Lesson 2 assessment.

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

- As animals meet their needs of food, water, air, and shelter, they may make changes to the environment around them. Some of these changes are beneficial to the environment, some of these changes are harmful, and some changes neither benefit nor harm the environment. For example,

beavers cut down trees and use them to build dams. The wood in the dam gives the beavers shelter and a place to raise their young. Beavers clearing smaller trees may help other forest plants get sunlight. A beaver dam blocks flowing water and causes it to pool and deepen. It also may cause water to move more slowly. Slow-moving water is a good place for animals such as frogs and insects to lay their eggs. But having less water flow downriver may cause harm to the plants and animals living downriver. The water that reaches them may not be enough for these living things to survive

- Some of the changes that animals make to the environment can happen quickly. Some happen much later. When cows pull up grass to eat, they may leave a bare patch of ground. This may allow insects to be seen and eaten by birds. It may also allow new plants to grow in the bare patch.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
ESS2.E: Biogeology ● Plants and animals can change their environment. (KESS2-2)	**Analyzing and Interpreting Data** ● Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. **Engaging in Argument from Evidence** ● Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).

Focus Question for this Lesson

How do animals change the environment?

Learning Intention	**Success Criteria**
I am learning how animals change their environment.	*I can engage in argument from evidence to explain how animals change their environment.*

Assessment(s)

- Page Keeley Science Probe - Animals and the Environment (Lesson 2)
- Performance Task - Beaver Dam (Lesson 2)
- Impacts On Earth's Systems Lesson 2 Test

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

- Rubrics
- Student self-regulation or self-monitoring
- Peer Evaluation
- Lesson Trackers
- Aggressive Monitoring
- Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Students may think that all changes animals make to the environment are negative. Students may need several different examples to understand that animals make positive changes to the environment as well. For example, a bird eating seeds might drop the seeds on the ground or spread the

seeds to a new location, which may cause a new plant to grow. Bees move pollen from flower to flower and pollinate the flowers and plants so that they produce fruit.
Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

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.

Plan for tiered learning

Lesson 2 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Lesson 3:	**People Change Environments**	**Estimated Time: 10 days (45 minutes per day)**

Brief Overview of Lesson:

- **Day 1:** Students will complete the **Page Keeley Science Probe -** *People and the Environment.* This is intended to serve as a pre-assessment and uncover students' basic ideas about how people impact the environment and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a family building a treehouse* by observing a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Landscape Architect* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How do humans change the environment?*
- **Day 3:** Students will complete the **Inquiry Activity -** *School Changes* to answer the question, "How have people changed the environment around my school?" Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning.
- **Day 4, 5, 6, and 7:** Students will be introduced to key vocabulary words that will be used throughout the lesson. Students will watch the video. Students will answer questions about the text and complete an activity. Students will watch the *Animals Changing Environments* video and answer questions. Students will complete the **Digital Interactive -** *Animals Help Plants*, answer questions and complete an activity. Students will revisit the **Page Keeley Science Probe -** *Animals and the Environment* to justify or change their initial response.
- **Day 7:** Students will complete the **Inquiry Activity -** *Annoying Animals.* Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning.
- **Day 8:** The teacher will read the **Science File** *How Humans Find Food in Their Environment*. Students will make a list of foods they recently ate and answer questions from the teacher. Students will discuss where their food comes from and then complete a drawing activity.
- **Day 9:** Students will complete the **Performance Task -** *Plan a Garden*. Students will define a problem and make a model. The teacher will use a **Talk About It** question to assess student understanding. Students will revisit the **Essential Question -** *How do humans change the environment?* Students will complete the Lesson 3 assessment.
- **Day 10:** Students will complete the **Performance Project -** *Create a Poster* to show changes to a river. Students will complete the Impacts on Earth's Surfaces Module assessment.

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

- Like all living things, humans have needs they must meet to survive. When humans collect food and water, and create shelter, they make changes to the environment. Earth has a large population of humans, and as they all find the resources to meet their survival needs, they are making big changes to the environment. People have machines that can change the environment at a fast pace.
- Some changes can benefit certain living things and negatively affect others. Creating an artificial lake destroys the area for forest creatures, but creates a freshwater ecosystem.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
ESS2.E: Biogeology • Plants and animals can change their environment. (KESS2-2)	**Analyzing and Interpreting Data** • Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. **Engaging in Argument from Evidence** • Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).

Focus Question for this Lesson

How do humans change the environment?

Learning Intention	**Success Criteria**
I am learning how humans change their environment.	*I can engage in argument from evidence to explain how people change their environment.*

Assessment(s)

- Page Keeley Science Probe - People and the Environment (Lesson 3)
- Performance Task - Plan a Garden (Lesson 3)
- Impacts On Earth's Systems Lesson 3 Test

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

- Rubrics
- Student self-regulation or self-monitoring
- Peer Evaluation
- Lesson Trackers
- Aggressive Monitoring
- Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Students may think that all changes animals make to the environment are negative. Students may need several different examples to understand that animals make positive changes to the environment as well. For example, a bird eating seeds might drop the seeds on the ground or spread the seeds to a new location, which may cause a new plant to grow. Bees move pollen from flower to flower and pollinate the flowers and plants so that they produce fruit.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

- 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
- Plan for tiered learning

Lesson 3 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Module 6:
Protecting Our Earth

Stage 1 – Desired Results	
ASSESSED FOCUS STANDARDS: **ESS3.C: Human Impacts on Earth Systems** ● Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3- 3) **ETS1.B: Developing Possible Solutions** ● Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (secondary to K-ESS3-3) **CONTENT CONNECTIONS:**	*Unit Description*  **Anchoring Phenomenon:** A house made from recycled bottles. **Statement**: Humans actions affect the Earth's resources. **Observation/Demonstration/Experience:** Photo of a house made from recycled bottles

ELA/Literacy

- **R.K.1:** With prompting and support, ask and answer questions about key details in a text.
- **SL.K.3:** Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
- **SL.K.5:** Add drawings or other visual displays to descriptions as desired to provide additional detail.

Mathematics

- **MP.2:** Reason abstractly and quantitatively.
- **MP.4:** Model with mathematics.
- **K.CC:** Counting and Cardinality

Driving Question: How do animals, plants and humans change the environment?

Meaning

ENDURING UNDERSTANDINGS:

- Pollution is a global problem.
- Things we use to make our lives more comfortable, such as cars and computers, can pollute our environment.
- A natural resource is something from Earth that people use.
- Conservation is one way everyone can help save our natural resources.

ESSENTIAL QUESTIONS:

- How do people's actions change land, air and water?
- How can we save natural resources?
- How can we take care of Earth?

What students will know and be able to do

KNOWLEDGE:

- Students will understand that humans impact Earth's systems and communicate a solution that will help reduce that impact. (Lesson 1)
- Students will understand that humans use Earth's natural resources and communicate a solution that will help conserve resources. (Lesson 2)
- Students will communicate solutions to the problem of excess waste that include reducing, reusing, and recycling. (Lesson 3)

SKILLS:

- **K-ESS3-3:** Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
  - [Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.]
  - Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas.
  - Events have causes that generate observable patterns.

- **K-2-ETS1-2:** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem
  - Develop a simple model based on evidence to represent a proposed object or tool.
  - The shape and stability of structures of natural and designed objects are related to their function(s).

Stage 2 – Evidence

SUMMATIVE ASSESSMENT(S)

- Performance Task - Air Quality (Lesson 1)
- Protecting Our Earth Lesson 1 Test
- Performance Task - Help the Environment (Lesson 2)
- Protecting Our Earth Lesson 2 Test
- Performance Task - Reduce Trash Poster (Lesson 3)
- Protecting Our Earth Lesson 3 Test
- Protecting Our Earth Module Performance Project - What Natural Resources Do You Use?
  - Protecting Our Earth Module Performance Project Rubric - What Natural Resources Do You Use?
- Protecting Our Earth Module Test

PRE-ASSESSMENT

- Page Keeley Science Probe - Pollution (Lesson 1)
- Page Keeley Science Probe - Natural Resources (Lesson 2)
- Page Keeley Science Probe - Reduce, Reuse, Recycle (Lesson 3)

Integration of 21st Century Skills

- **9.1.4.A.1:** Recognize a problem and brainstorm ways to solve the problem individually or collaboratively.
- **9.1.4.A.2:** Evaluate available resources that can assist in solving problems.
- **9.1.4.A.3:** Determine when the use of technology is appropriate to solve problems.
- **9.1.4.A.4:** Use data accessed on the Web to inform solutions to problems and the decision-making process.
- **9.1.4.A.5:** Apply critical thinking
- **9.1.4.B.1:** Participate in brainstorming sessions to seek information, ideas, and strategies that foster creative thinking.
- **9.1.4.D.1:** Use effective oral and written communication in face-to-face and online interactions and when presenting to an audience.
- **9.1.4.E.2:** Demonstrate effective communication using digital media during classroom activities.

Integration of Technology

- **Inspire Science Videos**
  - Poppy: Park Ranger
  - Kayle: Landscape Architect
  - Oil Spill
  - Pouring Water
  - Jin: Paleontologist
  - Recycling
  - Recycling Plant
- **Inspire Science Digital Interactives**
  - Pollution in the Park
  - Firewood From the Forest
  - Items Made From Plants
  - Recycled Objects
- **Generation Genius**
  - Reducing Our Impact On Earth
- **Google Classroom Virtual Assignments**
- **Bill Nye "Impacts On Earth's Systems" Videos**
  - Pollution Solution
- **Crash Course Kids "Protecting Our Earth"**

Career Education

- **Park Ranger:**
  - Introduce Career Kid Poppy, who wants to be a park ranger when she grows up. Park rangers make sure the park is safe and protected.
- **Landscape Architect:**
  - Introduce Career Kid Kayla, who wants to be a landscape architect when she grows up. Landscape architects design parks and gardens. They learn about how plants grow and stay healthy.
- **Paleontologist:**
  - Introduce Career Kid Jin, who wants to be a paleontologist when he grows up. Paleontologists study the history of life on Earth.

• **9.3.4.A.2:** Identify various life roles and civic and work-related activities in the school, home, and community. • **9.3.4.A.3:** Appraise personal likes and dislikes and identify careers that might be suited to personal likes. • **9.3.4.A.4:** Identify qualifications needed to pursue traditional and nontraditional careers and occupations. • **9.3.4.A.5:** Locate career information using a variety of resources.		

Stage 3 – Learning Plan

UNIT VOCABULARY

• compost • pollution • reuse	• conserve • recycle	• natural resource • reduce

SUMMARY OF KEY LEARNING

Lesson 1: Land, Air, and Water Pollution

Lesson 1: Day 1 - Land, Air, and Water Pollution - Module Opener

- **Learning Intention:** I am learning that we can make choices to reduce waste. I am learning about the phenomenon of a house made from recycled bottles.
- **Success Criteria:** I can make initial explanations by observing a house made from recycled bottles.
- **Brief Overview of Lesson:** Students will be introduced to the phenomenon of a house made from recycled bottles. Students will ask questions about the video of the phenomenon and answer questions from the teacher. Students will be introduced to key vocabulary for the *Protecting Our Earth* module. Students will examine the **STEM Career Kid Connection** of a Park Ranger.

Lesson 1: Day 2 and 3 - Land, Air, and Water Pollution - Assess and Engage

- **Learning Intention:** I am learning that pollutants can affect water. I am learning about the phenomenon of a polluted body of water.
- **Success Criteria:** I can choose a friend they think has the best idea about how humans should deal with pollution by completing the Page Keeley Science Probe. I can make initial explanations by observing a polluted body of water.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Pollution.* This is intended to serve as a pre-assessment and uncover students' basic ideas about pollution and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a polluted body of water*. by observing a photo. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Landscape Architect* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How do people's actions change land, air, and water?*

Lesson 1: Day 4 and 5 - Land, Air, and Water Pollution - Explore

- **Learning Intention:** I am learning that pollutants can affect water.
- **Success Criteria:** I can describe the effects of adding pollutants to water by adding common pollutants to a tank and observing how they can pollute fresh water and endangered plants and animals.

- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *River Pollution* by adding common pollutants to the tank and observing how they can pollute fresh water and endanger plants and animals. Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning, and students will answer questions about their investigation. The teacher will read the **Science Paired Read Aloud -** *A Big Difference* and students will answer questions about the text.

Lesson 1: Day 6, 7, and 8 - Land, Air, and Water Pollution - Explain

- **Learning Intention:** I am learning that oil spills can have major effects.
- **Success Criteria:** I can apply the Crosscutting Concept of cause and effect in relation to pollution, especially oil spills.
- **Brief Overview of Lesson:** Students will be introduced to key vocabulary words that will be used throughout the lesson. The teacher will read the **Science Paired Read Aloud -** *Humans Affect Earth*. Students will answer questions about the text and discuss with a partner. The teacher will read the **Science File -** *What is Pollution* and students will answer questions. Students will complete the **Digital Interactive -** *Pollution in the Park* and complete a drawing activity. Students will watch the *Oil Spill* video and answer questions. Students will revisit the **Page Keeley Science Probe -** *Pollution* to justify or change their initial response.

Lesson 1: Day 9 and 10 - Land, Air, and Water Pollution - Elaborate

- **Learning Intention:** I am learning what happens when oil mixes with water.
- **Success Criteria:** I can discuss the effects of pollution by participating in an Inquiry Activity based around the story, *The Lorax*. I can observe what happens when oil and water are mixed by carrying out an investigation.
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Listen to the Story*. Students will listen to the story *The Lorax* to learn about the effects of pollution. They will predict what will happen if the boy plants the last Truffula seed. Students will share their observations, answer questions about the investigation, and draw their conclusions. The teacher will use a **Talk About It** question to assess student understanding. Students will complete the **Inquiry Activity -** *Oil and Water*. Students will make a prediction, carry out an investigation, make observations, and record data.

Lesson 1: Day 11 - Land, Air, and Water Pollution - Evaluate

- **Learning Intention:** I am learning that tiny particles are found in the air.
- **Success Criteria:** I can investigate and discuss what tiny particles are found in the air by completing the performance task, *Air Quality*.
- **Brief Overview of Lesson:** Students will complete the **Performance Task -** *AIr Quality* to investigate what tiny particles are found in the air. Students will complete the Lesson 1 assessment.

Lesson 2: Help Save Natural Resources

Lesson 2: Day 1 and 2 - Help Save Natural Resources - Assess and Engage

- **Learning Intention:** I am learning that we can save our natural resources. I am learning about the phenomenon of drinking water from the tap.
- **Success Criteria:** I can choose a friend they think has the best idea about what a natural resource is by completing the Page Keeley Science Probe. I can make initial explanations by observing a video about drinking water from the tap.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Natural Resources*. This is intended to serve as a pre-assessment and uncover students' basic ideas about natural resources and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *drinking water from the tap* by observing a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Paleontologist* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How can we save natural resources?*

Lesson 2: Day 3 and 4 - Help Save Natural Resources - Explore

- **Learning Intention:** I am learning that we can use less water.

- **Success Criteria:** I can discuss and carry out an investigation about using less water.
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Use Less Water* to answer the question, "What will happen when you leave the water running while washing dishes?" Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning. The teacher will read the **Science Paired Read Aloud -** *Farm to Table.*

Lesson 2: Day 5, 6, and 7 - Help Save Natural Resources - Explain

- **Learning Intention:** I am learning that different items are made from plants.
- **Success Criteria:** I can discuss a variety of products and materials that are made by plants by completing the *Items Made From Plants* digital interactive. I can discuss and carry out an investigation about natural resources in the classroom by collectively classifying objects that do and do not come from living things. I can find out what types of pollution may be found in a park by participating in the digital interactive, *Pollution in the Park.*
- **Brief Overview of Lesson:** Students will be introduced to key vocabulary words that will be used throughout the lesson. Students will complete the **Digital Interactive -** *Items Made From Plants* and answer questions about the activity. The teacher will read the **Science Paired Read Aloud -** *Natural Resources,* and students will answer questions. Students will complete the **Digital Interactive -** *Firewood From the Forest*. Students will complete the **Inquiry Activity -** *Natural Resources in the Classroom.* Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning. Students will revisit the **Page Keeley Science Probe -** *Natural Resources* to justify or change their initial response.

Lesson 2: Day 8 - Help Save Natural Resources - Elaborate

- **Learning Intention:** I am learning where my food comes from.
- **Success Criteria:** I can explore where my food comes from by participating in the Inquiry Activity, *Food Sources*.
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Food Sources.* Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning.

Lesson 2: Day 9 - Help Save Natural Resources - Evaluate

- **Learning Intention:** I am learning ways to conserve natural resources.
- **Success Criteria:** I can create a model to show how I can reduce the amount of natural resources I use daily.
- **Brief Overview of Lesson:** Students will complete the **Performance Task -** *Help the Environment* to design a way to conserve a natural resource. Students will complete the Lesson 2 assessment.

Lesson 3: Reduce, Reuse, Recycle

Lesson 3: Day 1 and 2 - Reduce, Reuse, Recycle - Assess and Engage

- **Learning Intention:** I am learning about recycling.
- **Success Criteria:** I can choose a friend they think has the best idea about what reduce, reuse and recycle is about by completing the Page Keeley Science Probe. I can make initial explanations by observing a video of children recycling.
- **Brief Overview of Lesson:** Students will complete the **Page Keeley Science Probe -** *Reduce, Reuse, Recycle.* This is intended to serve as a pre-assessment and uncover students' basic ideas about recycling and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *children recycling* by observing a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Landscape Architect* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How can we take care of Earth?*

Lesson 3: Day 3 and 4 - Reduce, Reuse, Recycle - Explore

- **Learning Intention:** I am learning about what types of items can be recycled.
- **Success Criteria:** I can sort recyclables to learn how resources can be recycled by performing a hands-on investigation.
- **Brief Overview of Lesson:** Students will complete the **Inquiry Activity -** *Sorting Recyclables* to investigate different items that can be recycled and answer the question "What materials do you think can be recycled?" and observe how much trash they produce. Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning. The teacher will read the **Science Paired Read Aloud -** *Finley Fish Finds a New Stream* and students will answer questions.

Lesson 3: Day 5 and 6 - Reduce, Reuse, Recycle - Explain

- **Learning Intention:** I am learning about different types of objects that can be made from recycled material.
- **Success Criteria:** I can discuss and develop key vocabulary by responding to a video, *Recycling Plant* about what objects can be made from recycled materials that they use. I can explore what objects can be made from recycled material by participating in the digital interactive, *Recycled Objects.*
- **Brief Overview of Lesson:** Students will be introduced to key vocabulary words that will be used throughout the lesson. Students will watch the video *Recycling Plant.* Students will answer questions about the video. The teacher will read the **Science Paired Read Aloud -** *Taking care of Our Earth*, and students will answer questions and discuss with a partner. Students will complete **Digital Interactive -** *Recycled Objects* and answer questions. The teacher will use a **Talk About It** question to assess student learning. Students will revisit the **Page Keeley Science Probe -** *Reduce, Reuse, Recycle* to justify or change their initial response.

Lesson 3: Day 7 - Reduce, Reuse, Recycle- Elaborate

- **Learning Intention:** I am learning about composting.
- **Success Criteria:** I can sort pictures into two piles based upon which ones can and can't be composted by completing the digital interactive, *Composting*.
- **Brief Overview of Lesson:** Students will complete the **Digital Interactive -** *Composting*. Students will sort pictures into two piles: objects that can be composted and those that can't. Students will answer questions about the activity. Students will design a composter and draw their design.

Lesson 3: Day 8 and 9 - Reduce, Reuse, Recycle - Evaluate

- **Learning Intention:** I am learning that items can be reduced, reused or recycled.
- **Success Criteria:** I can communicate information about how to reduce, reuse, and recycle in the classroom by creating a Reduce Trash poster.
- **Brief Overview of Lesson:** Students will complete the **Performance Task -** *Reduce Trash Poster*. Students will work in a group to develop three ways to make less trash in your classroom and design a poster to share their ideas. Students will communicate information about how to reduce, reuse, and recycle in the classroom. The teacher will use a **Talk About It** question to assess student understanding. Students will revisit the **Essential Question -** *How can we take care of Earth?* Students will complete the Lesson 3 assessment.

Lesson 3: Day 10 and 11 - Reduce, Reuse, Recycle - Module Wrap-Up

- **Learning Intention:** I am learning about ways to reduce the waste of natural resources.
- **Success Criteria:** I can describe the different natural resources that my family uses by planning an investigation and developing a plan to reduce my use of that resource.
- **Brief Overview of Lesson:** Students will complete the **Performance Project -** *What Natural Resources Do You Use?* Students will plan an investigation to learn about the different natural resources their family uses. They will develop a plan to reduce their use of that resource. Students will complete the Protecting Our Earth Module assessment.

CULTURALLY RESPONSIVE TEACHING in PRACTICE	SOCIAL EMOTIONAL LEARNING in PRACTICE
● Search for famous scientists in the field of ecology, biology, botany, etc.	● Responsible Decision-Making ○ Making ethical, constructive choices about personal and social behavior

● Search for current events related to pollution, global warming, and endangered species, and any other way that environments can be changed. ● Try to find examples of a Park Ranger, Landscape Architect, and Paleontologist.	● Relationship Skills ○ Forming positive relationships, working in teams, dealing effectively with conflict

Lesson 1:	**Land, Air, and Water Pollution**	**Estimated Time: 11 days (45 minutes per day)**

Brief Overview of Lesson:

- **Day 1:** Students will be introduced to the phenomenon of a house made from recycled bottles. Students will ask questions about the video of the phenomenon and answer questions from the teacher. Students will be introduced to key vocabulary for the *Protecting Our Earth* module. Students will examine the **STEM Career Kid Connection** of a Park Ranger.
- **Day 2 and 3:** Students will complete the **Page Keeley Science Probe - *Pollution.*** This is intended to serve as a pre-assessment and uncover students' basic ideas about pollution and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *a polluted body of water*. by observing a photo. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Landscape Architect* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question** - *How do people's actions change land, air, and water?*
- **Day 4 and 5:** Students will complete the **Inquiry Activity** - *River Pollution* by adding common pollutants to the tank and observing how they can pollute fresh water and endanger plants and animals. Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning, and students will answer questions about their investigation. The teacher will read the **Science Paired Read Aloud** - *A Big Difference* and students will answer questions about the text.
- **Day 6, 7, and 8:** Students will be introduced to key vocabulary words that will be used throughout the lesson. The teacher will read the **Science Paired Read Aloud** - *Humans Affect Earth*. Students will answer questions about the text and discuss with a partner. The teacher will read the **Science File** - *What is Pollution* and students will answer questions. Students will complete the **Digital Interactive** - *Pollution in the Park* and complete a drawing activity. Students will watch the *Oil Spill* video and answer questions. Students will revisit the **Page Keeley Science Probe** - *Pollution* to justify or change their initial response.
- **Day 9 and 10:** Students will complete the **Inquiry Activity** - *Listen to the Story*. Students will listen to the story *The Lorax* to learn about the effects of pollution. They will predict what will happen if the boy plants the last Truffula seed. Students will share their observations, answer questions about the investigation, and draw their conclusions. The teacher will use a **Talk About It** question to assess student understanding. Students will complete the **Inquiry Activity** - *Oil and Water*. Students will make a prediction, carry out an investigation, make observations, and record data.
- **Day 11:** Students will complete the **Performance Task** - *Air Quality* to investigate what tiny particles are found in the air. Students will complete the Lesson 1 assessment.

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

- Pollution is a global problem. Things we use to make our lives more comfortable, such as cars and computers, can pollute our environment. Electronic devices, such as computers and smartphones, are replaced with newer versions. The outdated electronics often end up in landfills, contaminating the soil with metals. The exhaust from cars and factories produce chemicals that pollute the air. Some of these pollutants we can

see, such as the smoke from a fire. Other pollutants, like carbon dioxide, are invisible. Homes and factories generate sewage and garbage that can pollute land and water. Chemicals used to manufacture products, clean our homes, kill insects, or grow better lawns can seep into water and harm humans, plants, and other animals. Plastic does not go away. It litters roadsides, lakes, and oceans. Around the world, people and governments are working together to solve the problem of pollution and protect the Earth.

LESSON FOUNDATION

Assessed Standards for this lesson	Important content not included in the standards
ESS3.C: Human Impacts on Earth Systems ● Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3- 3) **ETS1.B: Developing Possible Solutions** ● Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (secondary to K-ESS3-3)	**Obtaining, Evaluating, and Communicating Information** ● Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. **Developing and Using Models** ● Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.

Focus Question for this Lesson

How do people's actions change land, air, and water?

Learning Intention	Success Criteria
I am learning how to reduce the impact of human actions on the Earth.	*I can understand that humans impact Earth's systems and communicate a solution that will help reduce that impact.*

Assessment(s)

- Page Keeley Science Probe - Pollution (Lesson 1)
- Performance Task - Air Quality (Lesson 1)
- Protecting Our Earth Lesson 1 Test

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

- Rubrics
- Student self-regulation or self-monitoring
- Peer Evaluation
- Lesson Trackers
- Aggressive Monitoring
- Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Students may believe that polluted air is always smoky and brownish in color. They may have a difficult time understanding that dangerous pollutants may be invisible to the naked eye. Help them understand by equating the situation to putting sugar in lemonade: you may not see the grains of sugar anymore, but you know that the sugar is in the lemonade. Also, help students understand that a loss of air quality is not always caused by human activity—a natural disaster such as a forest fire or a volcanic eruption can affect the air, too.

Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

- 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.
- Plan for tiered learning

Lesson 1 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Lesson 2:	**Help Save Natural Resources**	**Estimated Time: 9 days (45 minutes per day)**

Brief Overview of Lesson:

- **Day 1 and 2:** Students will complete the **Page Keeley Science Probe -** *Natural Resources.* This is intended to serve as a pre-assessment and uncover students' basic ideas about natural resources and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *drinking water from the tap* by observing a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Paleontologist* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How can we save natural resources?*
- **Day 3 and 4:** Students will complete the **Inquiry Activity -** *Use Less Water* to answer the question, "What will happen when you leave the water running while washing dishes?" Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning. The teacher will read the **Science Paired Read Aloud -** *Farm to Table*.
- **Day 5, 6, and 7:** Students will be introduced to key vocabulary words that will be used throughout the lesson. Students will complete the **Digital Interactive -** *Items Made From Plants* and answer questions about the activity. The teacher will read the **Science Paired Read Aloud -** *Natural Resources*, and students will answer questions. Students will complete the **Digital Interactive -** *Firewood From the Forest*. Students will complete the **Inquiry Activity -** *Natural Resources in the Classroom.* Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning. Students will revisit the **Page Keeley Science Probe -** *Natural Resources* to justify or change their initial response.
- **Day 8:** Students will complete the **Inquiry Activity -** *Food Sources.* Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning.
- **Day 9:** Students will complete the **Performance Task -** *Help the Environment* to design a way to conserve a natural resource. Students will complete the Lesson 2 assessment.

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

- A natural resource is something from Earth that people use. Plants, soil, rocks, water, sunlight, and air are natural resources. Oil and coal are also natural resources. We use many natural resources to make things. Some clothing is made of cotton, which comes from a plant. Furniture may be made of wood from a tree, which is a plant. Plants provide us with food. Air, sunlight, and water are essential to help plants grow.
- Conservation is one way everyone can help save our natural resources. For example, to conserve water, people might try to use less water when washing dishes or brushing their teeth. To conserve electricity, people can turn off lights and unplug devices that use electricity when they are not being used. Cars burn a lot of energy. To conserve energy, people might consider walking or using a bicycle for short trips.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
ESS3.C: Human Impacts on Earth Systems ● Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3- 3) **ETS1.B: Developing Possible Solutions** ● Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (secondary to K-ESS3-3)	**Obtaining, Evaluating, and Communicating Information** ● Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. **Developing and Using Models** ● Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.

Focus Question for this Lesson

How can we save natural resources?

Learning Intention	**Success Criteria**
I am learning about natural resources and how to conserve them.	*I can understand that humans use Earth's natural resources and communicate a solution that will help conserve resources.*

Assessment(s)

- Page Keeley Science Probe - Natural Resources (Lesson 2)
- Performance Task - Help the Environment (Lesson 2)
- Protecting Our Earth Lesson 2 Test

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

- Rubrics
- Student self-regulation or self-monitoring
- Peer Evaluation
- Lesson Trackers
- Aggressive Monitoring
- Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS

Anticipated Student Pre-Conceptions/Misconceptions

- Students may think Earth has always been the way it is now. Students may think that Earth could never run out of water, trees, or other natural resources. Some resources, such as trees, are renewable. New tree seeds or saplings can be planted and protected until they grow into mature

trees. Other resources, such as oil, are nonrenewable. Once all of the oil has been removed from Earth, there will be no more left. Help students understand that protecting Earth's natural resources is important because when nonrenewable resources are gone, we can't get them back. Even renewable resources must be cared for. Resources, such as water, can be damaged by human actions. The damaged resources may no longer be useful—or even harmful. Earth's natural resources, such as air, water, and land, help keep us alive, so it is up to us to protect them.
Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

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.

Plan for tiered learning

Lesson 2 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius

Lesson 3:	**People Change Environments**	**Estimated Time: 10 days (45 minutes per day)**

Brief Overview of Lesson:

- **Day 1 and 2:** Students will complete the **Page Keeley Science Probe -** *Reduce, Reuse, Recycle.* This is intended to serve as a pre-assessment and uncover students' basic ideas about recycling and uncover misconceptions that will drive lesson instruction. Students will return to the probe after completing the lesson to see how their thinking has changed. Students will also be introduced to the **phenomenon** of *children recycling* by observing a video. Students will make observations and ask questions about the phenomenon (questions to *hopefully* be answered throughout the lesson). Students will be introduced to the **Career Connection** of a *Landscape Architect* and answer questions in their notebook. Students will also use prior knowledge to answer the **Essential Question -** *How can we take care of Earth?*
- **Day 3 and 4:** Students will complete the **Inquiry Activity -** *Sorting Recyclables* to investigate different items that can be recycled and answer the question "What materials do you think can be recycled?" and observe how much trash they produce. Students will make a prediction, carry out an investigation, make observations and record data. The teacher will use a **Talk About It** question to assess student learning. The teacher will read the **Science Paired Read Aloud -** *Finley Fish Finds a New Stream* and students will answer questions.
- **Day 5 and 6:** Students will be introduced to key vocabulary words that will be used throughout the lesson. Students will watch the video *Recycling Plant.* Students will answer questions about the video. The teacher will read the **Science Paired Read Aloud -** *Taking care of Our Earth*, and students will answer questions and discuss with a partner. Students will complete **Digital Interactive -** *Recycled Objects* and answer questions. The teacher will use a **Talk About It** question to assess student learning. Students will revisit the **Page Keeley Science Probe -** *Reduce, Reuse, Recycle* to justify or change their initial response.
- **Day 7:** Students will complete the **Digital Interactive -** *Composting*. Students will sort pictures into two piles: objects that can be composted and those that can't. Students will answer questions about the activity. Students will design a composter and draw their design.
- **Day 8 and 9:** Students will complete the **Performance Task -** *Reduce Trash Poster*. Students will work in a group to develop three ways to make less trash in your classroom and design a poster to share their ideas. Students will communicate information about how to reduce, reuse, and recycle in the classroom. The teacher will use a **Talk About It** question to assess student understanding. Students will revisit the **Essential Question -** *How can we take care of Earth?* Students will complete the Lesson 3 assessment.
- **Day 10 and 11:** Students will complete the **Performance Project -** *What Natural Resources Do You Use?* Students will plan an investigation to learn about the different natural resources their family uses. They will develop a plan to reduce their use of that resource. Students will complete the Protecting Our Earth Module assessment.

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

- In 2012 alone, Americans generated about 250 million tons of trash. Materials in trash come from natural resources. We can create less trash if we recycle materials into new objects, reuse items, and reduce the amount of things we use. We can also use fewer materials that cannot be recycled, buy things made with recycled materials, and avoid over-packaged items.
- Before beginning this lesson, identify recycling centers in your community and the materials they accept.
- Composting is a process that breaks down plants so the nutrients can be reused to support new plant growth. Compost needs four things: air; water; dried or dead plant parts like leaves and pine needles; and fresh, living parts such as grass clippings, kitchen vegetable scraps, weeds, and other plants. Compost materials need to be added in layers, alternating between wet and dry.

LESSON FOUNDATION

Assessed Standards for this lesson	**Important content not included in the standards**
ESS3.C: Human Impacts on Earth Systems ● Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3- 3) **ETS1.B: Developing Possible Solutions** ● Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (secondary to K-ESS3-3)	**Obtaining, Evaluating, and Communicating Information** ● Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. **Developing and Using Models** ● Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.

Focus Question for this Lesson

How can we take care of Earth?

Learning Intention	**Success Criteria**
I am learning how to reduce, reuse, and recycle.	*I can communicate solutions to the problem of excess waste that include reducing, reusing, and recycling.*

Assessment(s)

- Page Keeley Science Probe - Reduce, Reuse, Recycle (Lesson 3)
- Performance Task - Reduce Trash Poster (Lesson 3)
- Protecting Our Earth Lesson 3 Test
- Protecting Our Earth Module Performance Project - What Natural Resources Do You Use?
  - Protecting Our Earth Module Performance Project Rubric - What Natural Resources Do You Use?
- Protecting Our Earth Module Test

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

- Rubrics
- Student self-regulation or self-monitoring
- Peer Evaluation
- Lesson Trackers
- Aggressive Monitoring
- Daily Checks for Understanding

STUDENT CONSIDERATIONS - INTEGRATED ACCOMMODATIONS & MODIFICATIONS
Anticipated Student Pre-Conceptions/Misconceptions
● Students may think that once something is produced, it lasts forever. Some students may know that things decompose, but may think it takes millions of years. Help students understand that some things, such as furniture, silverware, books, and dishes, can be reused just as they are. Other things, such as glass containers, can be recycled to make new glass containers or kitchen countertops. Some students may think that anything can be recycled. Explain that even some things made of glass cannot be recycled: some light bulbs cannot be recycled because of metal parts and a special coating. Tell students the best way to find out whether a product can be recycled is to read the label on the product package. Explain that trash does not disappear. It is taken to a landfill where it might sit for years. Show pictures of a landfill, if possible, to help students understand the amount of trash generated by people.
Integrated Accommodations & Modifications

English Language Learners/Sociocultural Implications:

- Create a vocabulary anchor chart
- Create an anchor chart the class can utilize/reference throughout the module
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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.
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard

Special Needs:

- Create a vocabulary anchor chart.
- Create an anchor chart the class can utilize/reference throughout the module.
- Use partnering strategy to allow students to work in teams.
- Provide students with pictures to cut and paste or use as a visual reference when answering questions
- Utilize scaffolding strategies
- Provide prompting and support
- 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
- Students can provide their answers verbally and the answers can be scribed. Students can copy their scribed answers to their questions.
- For fill in the blank questions, allow the students to choose the correct answer for each question by providing only two answer choices for each fill in the blank.
- Provide students with tangible manipulatives to complete sorting tasks
- Provide students with vocabulary words on an index card - students can use the cards to assist with formulating answers or for activities which requires students to sort
- 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)
- Provide students with a sheet of paper to only see one question at a time to reduce distraction
- Allow students to use Google Read&Write for text to speech using *Science Notebook* digital format or any other reading materials
- Allow students to use Google Read&Write for speech to text to construct sentences independently.
- Display worksheet/textbook on SmartBoard
- Provide students mini-breaks when necessary

Gifted and Talented:

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.
Plan for tiered learning

Lesson 3 Resources

- McGraw Hill *Science Handbook*
- McGraw Hill *Be a Scientist* Notebook
- Inspire Science
- Discovery Education Website
- Mystery Science
- Generation Genius