Grade 1	The Sun The Moon and The Stars	• **A HEALTHY AND SUSTAINABLE FUTURE IS POSSIBLE** • **LIVE BY THE NATURAL LAWS** • **We ARE ALL IN THIS TOGETHER** • **THINK 1000 YEARS**
Grade 1	Animal Adaptations	• **RECOGNIZE AND PROTECT THE COMMONS** • **HEALTHY SYSTEMS HAVE LIMITS** • **DIVERSITY MAKES OUR LIVES POSSIBLE**

Curriculum Framework
PLTW Launch – 1st Grade – Light: Observing the Sun, Moon, and Stars

PREFACE

In the previous Light and Sound module, students explored how light and sound travel over distances. The primary source of light on Earth is the Sun. The Sun is the star at the center of our solar system. Students learn that stars, including the Sun, generate their own light, while objects such as the moon reflect that light.

Throughout the module, students document patterns as they observe the Sun, moon, and stars. The ability to recognize patterns is an important scientific skill that researchers use to develop explanations of observations in nature.

Finally, students be challenged with the task of designing, building, and testing a device to protect students from ultraviolet (UV) radiation. Students analyze media to determine the peak times during the day for UV radiation and then design a cover for a playground structure.

Desired Results *(stage 1)*

Standards

Next Generation Science Standards

- 1-PS4-2. Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated.
- PS4.B: Electromagnetic Radiation – Objects can be seen if light is available to illuminate them or if they give off their own light.
- PS4.B: Electromagnetic Radiation – Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam.
- 1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted.
- 1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year.
- ESS1.A: The Universe and its Stars – Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted.
- ESS1.B: Earth and the Solar System – Seasonal patterns of sunrise and sunset can be observed, described, and predicted.

Transfer

Students will be able to independently use their learning to …

T1 – Evaluate a problem in a new and novel situation.
T2 – Apply a step by step design process to solve a problem.
T3 – Identify patterns from observable data.
T4 – Identify sources of light involved in viewing objects.

Meaning

UNDERSTANDINGS:
Students will understand that …

- U1 – The design process is a step by step method used to guide people in developing solutions to problems.
- U2 – Engineers and designers create new products or improve existing products and technology to meet human needs and wants.
- U3 – Engineers ask questions, make observations, and gather information about a situation people want to change.

ESSENTIAL QUESTIONS:
Students will keep considering …

- Q1 – What are some unique properties of light?
- Q2 – What are some unique properties of the Sun?

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• 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-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. • ETS1.A: Defining and Delimiting an Engineering Problem - Asking questions, making observations, and gathering information are helpful in thinking about problems. • 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. • ETS1.C: Optimizing the Design Solution – Because there is always more than one possible solution to a problem, it is useful to compare and test designs. • Science and Engineering Practice – Asking Questions and Defining Problems – Asking questions and defining problems in K-2 builds on prior experiences and progresses to simple descriptive questions that can be tested. • Science and Engineering Practice – 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. • Science and Engineering Practice – Planning and Carrying Out Investigations – 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,	• U4 – The shape of an object can help it perform as needed to solve a given problem. • U5 – Products may be analyzed by comparing objects designed to solve the same problem. • U6 – Engineers keep and organize all of their work in an engineering notebook. • U7 – Engineers share their work and get feedback from others during the design process. • U8 – Light travels over distances. • U9 – Objects can be seen only if they reflect available light or if they give off their own light. • U10 – Patterns of the motion of the Sun, moon, and stars can be observed, described, and predicted. • U11 – Seasonal patterns of sunrise and sunset can be observed, described, and predicted. • U12 – Ultraviolet rays from the Sun can cause damage to humans and are strongest during the middle of the day.	
	Acquisition	
	KNOWLEDGE: Students will… • K1 – Understand that products created by engineers and designers were created to meet a human need or want. U2 • K2 – Identify questions that engineers may ask when gathering information about a situation people want to change. U3	*SKILLS: Students will…* • S1 – Follow a step by step method to solve a problem. U1 • S2 – Examine how other people have tried to solve a design problem. U2 • S3 – Gather information about a situation people want to change. U3

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based on fair tests, which provide data to support explanations or design solutions. • Science and Engineering Practice – Analyzing and Interpreting Data – Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations. • Science and Engineering Practice – Using Mathematics and Computational Thinking – Mathematical and computational thinking in K-2 builds on prior experience and progresses to recognizing that mathematics can be used to describe the natural and designed world(s). • Science and Engineering Practice – Constructing Explanations and Designing 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. • Science and Engineering Practice – 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). • Science and Engineering Practice – 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. • Crosscutting Concept – Cause and Effect - Simple tests can be designed to gather evidence to support or refute student ideas about causes. • Crosscutting Concept – Patterns - Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. *Common Core ELA* • W.1.2 Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.	• K3 – Recognize the differences between a new object and an improved object. U2 • K4 – Recognize that light travels over distances. U8 • K5 – Describe how we see the Sun and other stars. U9 • K6 – Describe how we see the moon. U9	• S4 – Describe how the shape of a structure helps it function as needed to meet a human need or want. U4 • S5 – Brainstorm possible solutions and select one solution to develop, taking into account strengths and weaknesses of each design. U5 • S6 – Build and test a physical model of an improved object or tool designed to meet a human need or want. U2, U3 • S7 – Collect and analyze data from two models and compare the strengths and weaknesses of how each performed. U5 • S8 – Organize and maintain an engineering notebook to document work. U6 • S9 – Share findings and conclusions with others. U7 • S10 – Observe and describe patterns of the Sun. U10, U11 • S11 – Observe and describe patterns of the moon. U11 • S12 – Observe and describe patterns of the stars. U10 • S13 – Use data to determine a pattern of ultraviolet light radiation from the Sun over the course of a day. U12

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• SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.
  ○ SL.1.1a Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
  ○ SL.1.1b Build on others' talk in conversations by responding to the comments of others through multiple exchanges.
  ○ SL.1.1c Ask questions to clear up any confusion about the topics and texts under discussion.
• SL.1.5 Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.
• SL.1.6 Produce complete sentences when appropriate to task and situation.
 	
Common Core Math
• 1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.
• 1.MD.A.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.
• 1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
• 1.MD.B.3 Tell and write time in hours and half-hours using analog and digital clocks.		

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Evidence *(stage 2)*			Learning Plan *(stage 3)*	
Activities (A) Projects (P) Problems (B) (Module level)	Assessments FOR Learning	Assessments OF Learning	Activities (A), Projects (P), and Problems(B)	Knowledge and Skills
Activity 1: Patterns of the Sun	• Essential questions • Discussion of the problems faced by the students • Discussion of the two questions in Part 1 #3 • Images of sun tracker • Data documentation of the Patterns of the Sun in the Launch Log • Responses to questions presented in Patterns of the Sun in the Launch Log • Discussion of the observations	• Images of sun tracker • Data documentation of the Patterns of the Sun in the Launch Log • Responses to questions presented in Patterns of the Sun in the Launch Log • Discussion of the observations • Conclusion questions	Activity 1: Patterns of the Sun • In this activity students learn about the design process and are introduced to the design problem they will face at the conclusion of the module. Students will also observe and document patterns of the Sun, including how the Sun rises, moves across the sky, and sets.	K1, S10
Activity 2: Patterns of the Moon	• Essential questions • Discussion of *The Sun is My Favorite Star* • Completed K-W-L chart on Exploring the Moon • Discussion of observations of the Moon Globe app • Discussion of the Moon video • Discussion of the moon demonstration	• Completed K-W-L chart on Exploring the Moon • Completion of the Patterns of the Moon in the Launch Log • Documentation of observations of the Moon in the Launch Log • Conclusion questions	Activity 2: Patterns of the Moon • In this activity students learn how we see the moon even though it does not produce its own light. Students also observe and document patterns of the moon, including the apparent movement of the moon through the night sky and phases of the moon.	K6, S11

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	• Completion of the Patterns of the Moon in the Launch Log • Documentation of observations of the Moon in the Launch Log • Discussion of the Moon Globe app			
Activity 3: Patterns of the Stars	• Essential questions • Discussion of stars introduction • Documentation of the night sky in the Launch Logs • Discussion of the Stars video • Discussion of observations of the Sky Map by Mobius Entertainment app • Discussion of the stars demonstration • Documentation of observations of the stars in the Launch Log	• Documentation of the night sky in the Launch Logs • Documentation of observations of the stars in the Launch Log • Conclusion questions	Activity 3: Patterns of the Stars • In this activity students learn how we see stars as the light they generate travels through space. Students will also observe patterns of stars, including the trend that stars are able to be observed only at night.	K5, S12
Project: Mystery Beads	• Essential questions • Discussion of the Mystery Bead introduction • Creation of a mystery bead bracelet • Documentation of an image of and observations of a	• Creation of a mystery bead bracelet • Documentation of an image of and observations of a mystery bead bracelet • Documentation of an tests of a mystery bead bracelet	Project: Mystery Beads • This project is an inquiry experience as students learn about UV rays. The teacher will guide the students as they experiment and document results of exposing UV-sensitive "mystery" beads to sunlight.	S10, S13

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	mystery bead bracelet • Documentation of an tests of a mystery bead bracelet • Documentation of observations and consideration of sun light	• Documentation of observations and consideration of sun light • Conclusion questions		
Problem: Take Cover! Design Problem	• Essential questions • Documentation in the Launch Log of each of the design process steps • Discussion of each of the design process steps	• Documentation in the Launch Log of each of the design process steps • Discussion of each of the design process steps • Conclusion questions	Problem: Take Cover! Design Problem • In this design problem, students will design a covering for a playground to protect students from UV exposure. They will use the UV-sensitive beads and a UV flashlight to determine the effectiveness of their design to protect students playing on the playground at midday.	K1, K2, K3, S1, S2, S3, S4, S5, S6, S7, S8, S9
Light: Observing the Sun, Moon, and Stars Check for Understanding		Check for Understanding Summative Assessment	Light: Observing the Sun, Moon, and Stars Check for Understanding	K4, K5, K6, S10, S11,S12

Curriculum Framework
PLTW Launch – 1st Grade – Animal Adaptations

PREFACE

In this module, students are presented with the problem of preparing an ideal traveler for a visit to an extreme environment and designing the ideal shoe for this traveler to wear in this environment. Students look to plant and animal adaptations to guide them as they make choices about how to prepare their traveler. Students learn what it means for an organism to be adapted to its environment and how different adaptations can be categorized. Through various investigations, students explore an example of adaptations for protection, camouflage, food, and locomotion. They complete an inquiry investigation to explore how different beak shapes are best adapted for gathering different foods. They then investigate organisms that live in an extreme environment and document the variety of adaptations that each of these organisms display. Students combine all of their knowledge of plant and animal adaptations with their understanding of the extreme environment to prepare their traveler and design their shoe.

Desired Results *(stage 1)*

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Standards

Next Generation Science Standards

- 1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
- LS1.A Structure and Function. All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air. Plants also have different parts that help them survive and grow.
- LS1.B D Information Processing. Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs.
- 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.
- ETS1.A Defining and Delimiting Engineering Problems
  - Asking questions, making observations, and gathering information are helpful in thinking about problems.
  - Before beginning to design a solution, it is important to clearly understand the problem.
- ETS1.B Developing Possible Solutions – Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in

Transfer

Students will be able to independently use their learning to …

T1 – Use knowledge of animal adaptations in a given environment to inform decisions about what humans need to do to adapt to that same environment.
T2 – Apply a step by step process to design and perform investigations to find answers to questions.
T3 – Utilize critical thinking skills to solve a problem.

Meaning

UNDERSTANDINGS: Students will understand that …

- U1 – Scientists ask and identify questions to gain knowledge or solve problems.
- U2 – Scientists develop and use models to represent amounts, relationships, relative scales, and/or patterns in the natural and designed world(s).
- U3 –Scientists plan and conduct investigations collaboratively to produce data that serves as evidence used to answer questions.
- U4 – Scientists make predictions based on prior experiences.
- U5 – Scientists make observations and/or collect data to construct evidence-based conclusions for natural phenomena.
- U6 – Scientists keep and organize all of their work in a scientific notebook.
- U7 – Scientists work collaboratively and communicate their findings with others.
- U8 – The design process is a step by step method used to

ESSENTIAL QUESTIONS: Students will keep considering …

- Q1 – How do plants and animals adapt to their environments?
- Q2 – How do different environments affect the needs of humans?
- Q3 – What can happen if plants or animals do not adapt to the environment?

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communicating ideas from a problem's solutions to other people.
• ETS1.C Optimizing the Design Solution – Because there is always more than one possible solution to a problem, it is useful to compare and test designs.
• Cross Cutting Concept - Systems and System Models – A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.
  ○ Objects and organisms can be described in terms of their parts.
  ○ Systems in the natural and designed world have parts that work together.
• Cross Cutting Concept - Structure and Function – The way an object is shaped or structured determines many of its properties and functions.
  ○ The shape and stability of structures of natural and designed objects are related to their function(s).
• Science and Engineering Practice – Asking Questions and Defining Problems – Asking questions and defining problems in K-2 builds on prior experiences and progresses to simple descriptive questions that can be tested.
• Science and Engineering Practice – 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.
• Science and Engineering Practice – Planning and Carrying Out Investigations – Planning and carrying out investigations to answer questions or test solutions to problems in K-2 builds on prior experiences and
	guide people in developing solutions to problems.
	• U9 – Living organisms have special structures and behave in certain ways that help them survive in their environment.
	• U10 – Humans need to take proper steps to adapt to a given environment.	

	Acquisition	
	KNOWLEDGE: Students will… • K1 – Identify similarities and differences between organisms adapted to different environments. U2, U9 • K2 –Recognize that there are different environments around the world, each with unique characteristics. U9, U10 • K3 – Describe ways that humans have adapted their behavior to different environments. U3, U9, U10	*SKILLS: Students will…* • S1 – Categorize animal and plant adaptations (i.e., for protection, for camouflage, for food, for locomotion). U2, U9 • S2 – Draw and communicate conclusions about observed animal and plant adaptations. U1, U2, U3, U4, U5, U6, U7, U9 • S3 – Perform a guided investigation in order to draw conclusions. U1, U2, U3, U4, U5, U6, U7, U9 • S4 – Maintain a notebook to document work. U6 • S5 – Share findings and conclusions with others. U7 • S6 – Follow a step by step method to solve a problem. U1, U2, U3, U5, U6, U7, U8, U9, U10

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progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. • Science and Engineering Practice – Analyzing and Interpreting Data – Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations. • Science and Engineering Practice – Using Mathematics and Computational Thinking – Mathematical and computational thinking in K-2 builds on prior experience and progresses to recognizing that mathematics can be used to describe the natural and designed world(s). • Science and Engineering Practice – Constructing Explanations and Designing 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. • Science and Engineering Practice – 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). • Science and Engineering Practice – 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. *Common Core ELA* • RL.1.1 Ask and answer questions about key details in a text. • RL.1.2 Retell stories, including key details, and demonstrate understanding of their central message or lesson.		

• RL.1.3 Describe characters, settings, and major events in a story, using key details. • RI.1.1 Ask and answer questions about key details in a text. • RI.1.2 Identify the main topic and retell key details of a text. • RI.1.10 With prompting and support, read informational texts appropriately complex for grade 1. • RF.1.4 Read with sufficient accuracy and fluency to support comprehension. • W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. • SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. • SL.1.1.A Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion). • SL.1.1.B Build on others' talk in conversations by responding to the comments of others through multiple exchanges. • SL.1.1.C Ask questions to clear up any confusion about the topics and texts under discussion. • SL.1.2 Ask and answer questions about key details in a text read aloud or information presented orally or through other media. • SL.1.5 Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings. • SL.1.6 Produce complete sentences when appropriate to task and situation. • L.1.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 1 reading and content*, choosing flexibly from an array of strategies.		

• L.1.5 With guidance and support from adults, demonstrate understanding of word relationships and nuances in word meanings.
• L.1.6 Use words and phrases acquired through conversations, reading and being read to, and responding to texts, including using frequently occurring conjunctions to signal simple relationships (e.g., *because*).
 	
Common Core Math
• 1.NBT.A.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
• 1.NBT.B.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:
  ○ 1.NBT.B.2.A 10 can be thought of as a bundle of ten ones — called a "ten."
  ○ 1.NBT.B.2.B The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
  ○ 1.NBT.B.2.C The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
• 1.NBT.B.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.
• 1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.		

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Evidence *(stage 2)*			Learning Plan *(stage 3)*	
Activities (A) Projects (P) Problems (B) (Module level)	Assessments FOR Learning	Assessments OF Learning	Activities (A), Projects (P), and Problems(B)	Knowledge and Skills
Activity 1 Animal Adaptations	• Essential questions • Discussion of what was special about each animal's "coat" • Classification of adaptations covered in the *Fur and Feathers* story as adaptations for camouflage, protection, food, or locomotion • Discussion of examples of adaptations for food obtainment • Identification and discussion of which adaptation shown in Launch Log is best suited for climbing, swimming, and flying long distances • Matching of each animal with the protection poem • Discussion and documentation of inquiry activity	• Drawing of an adaptation for each adaptation category (camouflage, protection, food, locomotion) in the Launch Log • Class discussion of which adaptation shown is best suited for climbing, swimming, and flying long distances • Class discussion of all of the ways the animals discussed protect themselves and why some of the adaptations are specific to the animal's environment • Discussion of findings for why the patterned butterflies were more difficult to find than the solid-colored butterflies and how this relates to camouflage protecting animals from their predators	Activity 1 Animal Adaptations • In this activity students will read a story describing why different animals have different outer coverings, or coats, specially adapted to help them live in their environment. Students will learn what it means for an organism to be adapted to its environment and will begin to learn how different adaptations can be categorized. • Students will investigate how different adaptations help animals survive in the environment in which they live. Through various investigations, students will explore examples of adaptations related to locomotion, protection, and camouflage. ○ Camouflage: Students will act as the predators that eat butterflies. They will need to eat as many butterflies as possible before they fly away. They will do this by picking up as many butterflies as possible in 20 seconds. They will compare how many butterflies they ate were camouflaged versus non-camouflaged. ○ Locomotion: Students will be posed with a specific task (climbing, swimming, and flying) and will identify which adaptation would be best suited to complete the task.	K1, S1, S2, S4

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		• Conclusion questions	○ Protection: Students will match animals with the corresponding description of how they protect themselves. (I protect myself by…… what am I?)	
Activity 2 Which Beak Is Best?	• Essential questions • Discussion and documentation of all steps of the scientific inquiry process • Identification and discussion of which beak was best suited for each food	• Discussion and documentation of all steps of the scientific inquiry process for their experiment • Conclusion questions	Activity 2 Which Beak Is Best? • In this activity students will complete a scientific inquiry investigation to explore how different beak structures are related to gathering food. Students will act as birds searching for food and will use different utensils (a spoon, a clothespin, and tweezers) to represent the beaks of different birds. The marbles, toothpicks, and straw represent the different foods consumed by these birds. Students will perform various trials to determine which beak is best adapted to pick up each type of food.	S2, S3, S4, S5
Activity 3 The Map	• Essential questions • Completion of the Animal Adaptations presentations • Record corresponding information in Launch Log, as prompted in the Animal Adaptations presentations	• Record corresponding information in Launch Log, as prompted in the Animal Adaptations presentations • Classification of each adaptation documented in the corresponding adaptation category • Conclusion questions	Activity 3 The Map • In this activity the students will explore five different environments: the Arctic, the African Savanna, the Sahara Desert, the Pacific Ocean, and the Amazon Rainforest. All students will explore the Pacific Ocean, and then each group will explore one of the remaining four environments. They will then investigate organisms that live in each of these environments and explore the variety of adaptations that each of these organisms possess. Students will pretend they are preparing a traveler for a trip to this exotic new land. They will consider clues provided by the animals and plants that are	K1, K2, S1, S2, S4

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				successfully adapted to this environment.	
Project 4 World Traveler	• Essential questions • Discussion in groups of what to include on environment poster board • Brainstorming and assembly of adaptation designs for the traveler	• Completion of environment poster boards that include all key information about the environment that the traveler will be exploring, including the climate and plants and animals found in that environment • Justification of design of the four adaptations to help the traveler: one to help gather food, one to help move around the environment, one for protection, and one to camouflage the traveler • Discussion of how the designs mimic how plants and/or animals use their parts to help them survive, grow, and meet their needs • Conclusion questions	Project 4 World Traveler • In this project students will design an ideal traveler to survive in the assigned environment. They will think about how they need to prepare their traveler to endure the challenges of the environment. They will design four innovative adaptations: one to help their traveler gather food, one to help the traveler move around in the environment, one to protect the traveler in the environment, and one to camouflage the traveler in the environment. The designs should mimic how plants and/or animals use their parts to help them survive, grow, and meet their needs. Student examples might include a special waterproof coat that will protect against the rain by mimicking fish scales or a coat that will keep the traveler warm in the air and water by mimicking a polar bear's fat and thick fur. Students will also justify how each adaptation will help the traveler in the given area. • Students will draw their designs or find materials to model their designs on their traveler.	K1, K2, K3, S1, S2,S4, S5, S6
Problem 5 Traveling Shoes	• Essential questions	• Documentation of each of the design process	Problem 5 Shoe Design		K2, K3, S4, S5, S6

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	• Documentation of each of the design process steps in the Launch Log • Discussion of each of the design process steps	steps in the Launch Log • Discussion of each of the design process steps • Conclusion questions • Reflection on strengths and weaknesses of final design.	• In this problem students will design a shoe for their traveler to wear in the assigned environment. Students will follow the engineering design process to modify a canvas shoe to prepare it for the environment. Students will use what they learned throughout the module about their environment, as well as about animal adaptations, to determine how to modify their shoe. They will need to modify the shoe to help the traveler with three of the categories of adaptions– camouflage, protection, and locomotion.	
Animal Adaptations Check for Understanding		• Check for Understanding Summative Assessment	Animal Adaptations Check for Understanding	

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Animal Adaptations
Check for Understanding

1. Which tiger would be better adapted to live in the Arctic?

2. A porcupine's sharp quills are what type of adaptation?

Locomotion Protection Food Camouflage

3. Which foot is better adapted for movement in water?

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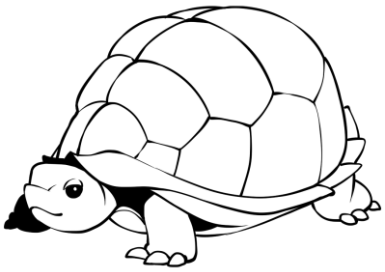
4. Which animal would be better adapted to reach into holes to gather insects for food?



5. Why did you pick the animal above?

_____

_____

_____

_____

_____

6. Describe one adaptation a shark has for living in its ocean environment.

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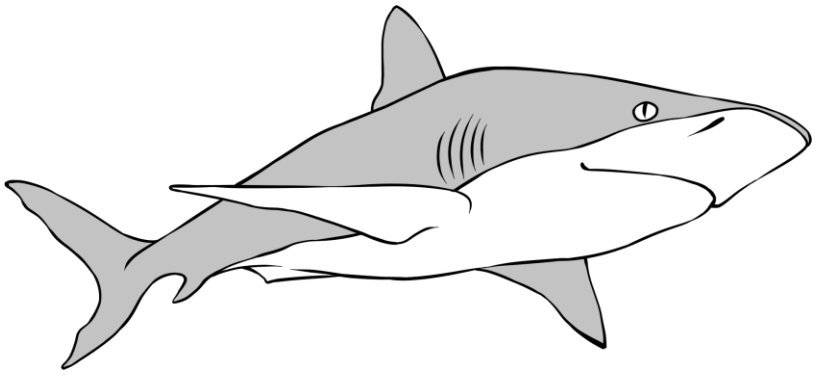

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Light: Observing the Sun, Moon, and Stars Check for Understanding

Circle the word that makes the sentence true.

1. The Sun _____ light.

   creates reflects

2. The moon _____ light.

   creates reflects

3. Our eyes see sunlight _____ it travels through space.

   before after

4. We _____ see stars during the day because the Sun shines so brightly.

   can cannot

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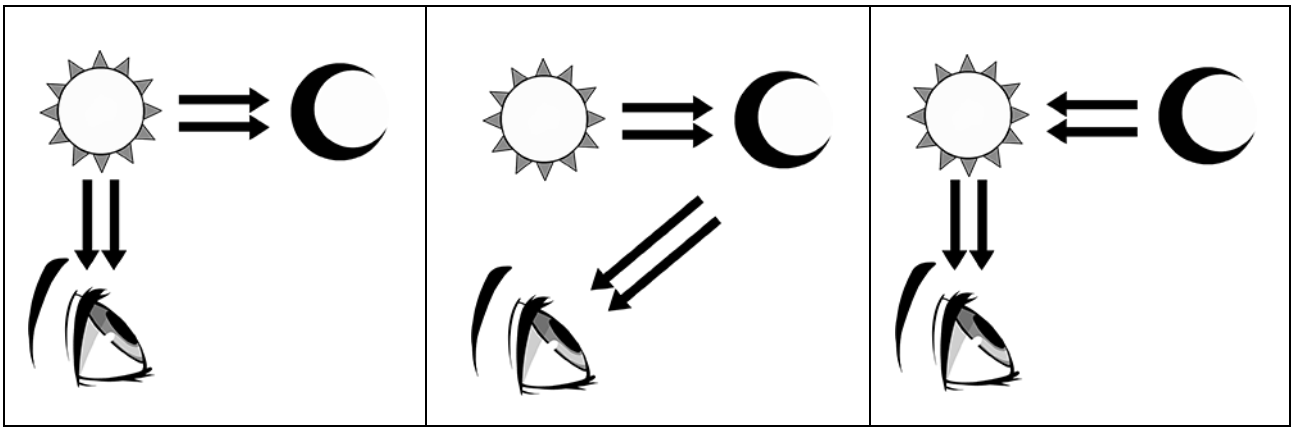
5. Circle the picture that best shows how the light from the Sun reflects to help us see the moon.



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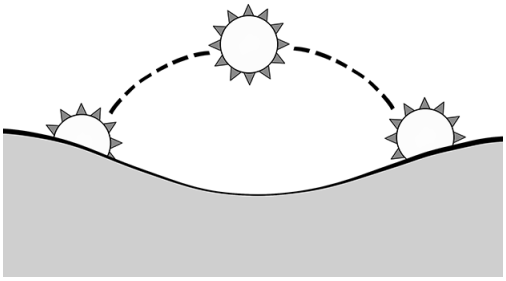
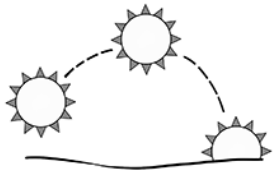
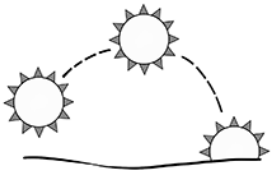
6. This is what Anthony observed as the Sun rose, moved across the sky, and then set.



He drew a picture of his observation on Monday and Tuesday. Draw what he will see you expect as he watches the Sun on Wednesday.

Day	Pattern of Sun rising
Monday	
Tuesday	
Wednesday	

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