



Park Hill School District

Building Successful Futures • Each Student • Every Day

1st Grade Science Curriculum

Course Description: First graders will have three science units; earth and space science, physical science, and life science. During the earth and space unit, students will observe patterns of the sun, moon, and stars. They will be able to describe these patterns and make accurate relative predictions. Students will also make seasonal observations and relate amounts of daylight to different times of the year. In the physical science unit, students will be able to observe and record how sound is made. Students will also create and design an instrument that creates sounds. Students will also understand the concept of reflection and how it affects light movement. Students will use light or sound to solve a problem of communicating over distance. During life science units, students will 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. Students will make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Scope and Sequence:

Unit	Timeframe
1. Patterns In the Sky • Topic 1: Seasonal Patterns • Topic 2: Patterns in Space	4-5 weeks
2. Communicating with Light and Sound • Topic 1: Sound • Topic 2: Communication	5 weeks
3. Design From Nature • Topic 1: Parts of Animals • Topic 2: Animal Survival • Topic 3: Parts of Plants • Topic 4: Plant Survival 4. Parents and Their Offspring • Topic 1: Animal Trait Inheritance and Variation • Topic 2: Plant Trait Inheritance and Variation	12 weeks

Curriculum Revision Tracking

Spring 2018

- Emphasized and added Cross Cutting Concepts
- Reordered some scopes
- Prioritized lessons

Summer 2020

- Updated to STEMscope 3D

Spring 2023

- Removed the Behavior of Light scope based on standards
- Adding clarifying language with Missouri Learning Standards

Spring 2024

- None

Unit 1: Patterns in the Sky

Subject: Science

Grade: 1

Name of Unit: Earth and Space Science

Length of Unit: 20 days

Overview of Unit: During this unit, students will be exploring many phenomena while learning the following concepts:

- Sunrise and sunset can be observed, described, and predicted each season.
- The movement of the sun, the moon, and stars follows a pattern and can be predicted.

Anchoring Phenomena Event (to start the unit)

Students interact with a video of moving shadows in a park over time.

Anchoring Phenomena Driving Question

What patterns do we see in the day and night sky?

Mission Performance Task (to end the unit)

Students will apply their knowledge of the patterns of sunrise, sunset, and the motion of the Sun, Moon, and stars by creating a new alarm clock for the Space Museum gift shop.

The scopes included in this unit include the following:

- Seasonal Patterns
- Patterns in Space

Topic 1: Seasonal Patterns

Suggested Length of Time: 11 days

Essential Questions (Student Wondering):

- How is day length related to the seasons?

Enduring Understanding (Learning Objectives/Performance Expectations):

- The student is expected to make observations at different times of year to relate the amount of daylight to the time of year.

Standards Addressed

Priority:

Missouri Learning Standards:

- K.ESS1.B.1 Make observations during different seasons to relate the amount of daylight to the time of year.

Disciplinary Core Ideas (DCI):

- 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. (1-ESS1-1)

Supporting:

Crosscutting Concept (CC) and Science and Engineering Practice (SER):

- Planning and Carrying Out Investigations: Make observations (firsthand or from media) to collect data that can be used to make comparisons. (1-ESS1-2)
- Patterns Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-1),(1-ESS1-2)

Detailed Description/Instructions:

5 E's	Suggested # of Days	Notes
ENGAGE Investigative Phenomena- Video <i>How are the length of daylight and the seasons related?</i> APK- <i>Students will discuss statements about the amount of daylight during each season and choose the statement they agree with most.</i> Graphic Organizer-Daylight and Darkness <i>Charting daylight and darkness</i> Hook: Day or Night? <i>Students differentiate between activities that are done during the day and activities that are done at night.</i>	1 Day	Materials • Copy related files. • craft stick
EXPLORE Explore 1:Activity- Length of Day and Night <i>Students will graph and analyze the amount of daylight their city receives throughout the year.</i>	2 Days	Materials • Copy related files. • sticky notes • tape For this activity, the teacher must gather a year's worth of data on the number of daylight hours for their city. Website to access data: http://www.sunrisesunset.com/USA/Missouri.asp
EXPLORE Explore 2:Activity- Fun in the Sun! <i>Students create a poster to present how the amount of daylight affects what they do.</i>	3-4 Days	Materials • copy related files • books about seasons
EXPLAIN & ELABORATE Stemscopedia & Picture Vocabulary	2-3 Days	Pick 2 - 3 activities to extend concepts, consider adding voice

		and choice for students. Must Do StemScopedia and Picture Vocabulary
EVALUATE Mission Anchor Chart Readdress the mission and display the anchor chart	1 Day	<i>Complete CER.</i> <i>Other assessments optional.</i> See Anchoring Phenomena Event Teacher Guide for anchor chart suggestions

Topic 2: Patterns in Space

Suggested Length of Time: 9 days

Essential Questions (Student Wondering):

- What are some patterns of the Sun-Earth-Moon system?

Enduring Understanding (Learning Objectives):

- The student is expected to use observations of the sun, moon, and stars to describe patterns that can be predicted.

Standards Addressed

Priority:

Missouri Learning Standards:

- 1.ESS1.A.1 Describe the presence of the sun, moon, and stars in the sky over time
- 1.ESS1.A.2 Use observations of the sun, moon, and stars to describe patterns that can be predicted.

Disciplinary Core Ideas (DCI):

- The Universe and its Stars Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1)

Supporting:

Crosscutting Concepts (CC)/ Science and Engineering Practices (SER):

- Analyzing and Interpreting Data: Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (1-ESS1-1)
- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-1),(1-ESS1-2)
- Connections to Nature of Science: Scientific Knowledge Assumes an Order and Consistency in Natural Systems -Science assumes natural events happen today as they happened in the past. (1-ESS1-1) Many events are repeated. (1-ESS1-1)

Detailed Description/Instructions:

5 E's	Suggested # of Days	Notes
ENGAGE Investigative Phenomena- Video <i>How do we know when the sun will rise and set?</i> APK-<i>Students read or listen to the children's thoughts about patterns of objects in the sky and decide which opinions they agree with most.</i> Graphic Organizer-What Do We See? <i>Day/Night Venn Diagram</i>		Materials: ● copy related files ● red/green squares ● globe ● flashlight ● sticker 2 Activities *(Hook) Teacher uses globe and flashlight to model the position of the Earth and sun

Hook: Day and Night <i>Students reflect on objects they see in the sky during the day and night.</i>		*(APK) Students Make a T-Chart for Day and Night <i>By the end of this lesson students should be able to say what they see in the daytime versus the nighttime.</i>
EXPLORE Explore 1: Scientific Investigation- Observing Objects in the Sky <i>Students observe what they see in the sky at different times.</i>	4 Days	Materials ● copy related files Students make predictions and observations about the sky during different times of the day for 4 days. Teachers will ask students about what they noticed about the sun each morning? What did they notice about the sky at noon? What did they notice about the sky each afternoon? Students can draw or write observations.
EXPLORE Explore 2: Activity- Day and Night Patterns <i>Students sequence cards showing the motion of the Sun from sunrise to sunset as well as other cards showing the motion of the Moon from moonrise to moonset.</i>	1 Day	Materials ● copy related files ● tape ● zip-loc baggie
EXPLAIN & ELABORATE Stemscopedia & Picture Vocabulary	2 -3 Days	Pick 2 - 3 activities to extend concepts, consider adding voice and choice for students. Must Do StemScopedia and Picture Vocabulary (Whole Group)
EVALUATE Mission Anchor Chart Readdress the mission and display the anchor chart	1 Day	<i>Complete CER.</i> <i>Other assessments optional.</i> See Anchoring Phenomena Event Teacher Guide for anchor chart suggestions

Engaging Scenario/Action Plan

Engaging Scenario/Action Plan

After the scopes are complete, students will use the information they gathered on the class Anchor Chart to help them complete their Action Plan. Briefly review the Anchor Chart. Students should complete the Action Plan as a group.

Action Plan:

Design an alarm clock that shows the difference between day and night.

- It should show when it is day and when it is night.
- It should show which objects are in the sky , whether it is day or night.
- It should show the difference in sunlight depending on the season.

Unit 2: Communicating with Light and Sound

Subject: Science

Grade: 1st

Name of Unit: Communicating with Light and Sound

Length of Unit: 32 days

Overview of Unit: During this unit, students will be exploring many phenomena while learning the following concepts:

- Sounds can make things vibrate.
- When something vibrates, it can make a sound.
- Light helps us see.
- Light passes through objects differently.
- Some materials reflect light; others allow some light through or no light at all, creating a shadow.
- People use a variety of devices to communicate over a long distance.

Anchoring Phenomena Event (to start the unit)

Students interact with a video of a male peacock spreading its feathers.

Anchoring Phenomena Driving Question

How can light and sound be used to communicate?

Mission Performance Task (to end the unit)

Students will design a device that uses light and sound as a new form of communication.

The scopes included in this unit include the following:

- [Sound](#)
- [Communication](#)

Topic 1: Sound

Suggested Length of Time: 9 days

Essential Questions (Student Wondering):

- How do we make sounds?

Enduring Understanding (Learning Objectives/Performance Expectations):

- The student is expected to plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.
- The student is expected to 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.

Standards Addressed

Priority:

Missouri Learning Standard

- 1.PS4.A.1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.

Disciplinary Core Ideas (DCI)

- PS4.A: Wave Properties Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1)

Supporting:

Crosscutting Concepts (CC)/ Science and Engineering Practices (SER):

- Planning and Carrying Out Investigation: Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question. (1-PS4-1),(1-PS4-3)
- Connections to Nature of Science: Scientific Investigations Use a Variety of Methods -Science investigations begin with a question. (1-PS4-1) Scientists use different ways to study the world. (1-PS4-1)
- Cause and Effect Simple tests can be designed to gather evidence to support or refute student ideas about causes. (1-PS4-1),(1-PS4-2),(1-PS4-3)

Detailed Description/Instructions:

5 E's	Suggested # of Days	Notes
ENGAGE Investigative Phenomena- Video <i>How does a drum make sound?</i> APK-<i>Students discuss what makes sound. Then, while touching their throat, students say their name and share what they feel.</i> Graphic Organizer-Good Vibrations <i>Examples of how sound can make matter vibrate and how vibrating matter can make sound.</i> Hook: Laser Show <i>Students observe and describe what happens to a laser light when a vibrating tuning fork is placed on it.</i>	1 Day	Materials: ● copy related files ● tuning fork ● laser light
EXPLORE Explore 1: Activity- Sound Stations <i>Students rotate through different sound stations.</i>	1-2 Days	See the STEMscope material list. Students visit four stations to observe and record how sound is made.
EXPLORE Explore 2: Inquiry Investigation- Sound System <i>Students discover how different materials affect the type of sound that is made.</i>	2 Days	Materials: ● copy related files ● plastic cups ● string ● spoons
EXPLAIN & ELABORATE Stemscopedia & Picture Vocabulary	2-3 Days	Pick 2 - 3 activities to extend concepts, consider adding voice

		and choice for students. Must Do: STEMscopedia & Picture Vocabulary (Whole Group)
EVALUATE: CER/ Open-Ended Response/Multiple Choice Mission Anchor Chart Readdress the mission and display the anchor chart	1 Day	<i>Complete CER.</i> <i>Use other assessments as needed.</i> See Anchoring Phenomena Event Teacher Guide for anchor chart suggestions

Topic 2: Communication

Suggested Length of Time: 13 days

Essential Questions (Student Wondering):

- How do we communicate over long distances?

Enduring Understanding (Learning Objectives/Performance Expectations):

- The student is expected to use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.
- The student is expected to 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.
- The student is expected to 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.
- The student is expected to analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Standards Addressed

Priority:

Missouri Learning Standards

- 1.PS4.C.1 Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.

Disciplinary Core Ideas (DCI):

- PS4.C: Information Technologies and Instrumentation People also use a variety of devices to communicate (send and receive information) over long distances. (1-PS4-4)

Supporting:

Crosscutting Concepts (CC)/ Science and Engineering Practices (SER):

- Constructing Explanations and Designing Solutions: Use tools and materials provided to design a device that solves a specific problem. (1-PS4-4)
- Connections to Engineering, Technology, and Applications of Science: Influence of Engineering, Technology, and Science, on Society and the Natural World
-People depend on various technologies in their lives; human life would be very different without technology. (1-PS4-4)

Detailed Description/Instructions:

5E's	Suggested # of Days	Notes
ENGAGE: Investigative Phenomena-Video <i>How do lighthouses communicate with ships and boats?</i> APK: Is It a Form of Communication?	1 Day	Materials: ● Student Journal ● Communication device cards ● bar graph

<i>Students respond with either a thumbs up or down when asked if an image represents a form of communication.</i> Graphic Organizer- Sending Messages <i>Draw or write ways to communicate using light and sound.</i> Hook: How Do We Communicate? <i>Students are introduced to and discuss the different ways we communicate.</i>		
EXPLORE: Explore 1:Activity- Talking With Lights <i>Students experiment with communication through the use of Morse code</i>	1-2 Days	Materials: ● Flashlight ● dark paper ● Student Journal
EXPLORE: Explore 2: Inquiry Investigation-What Did We Hear? <i>Students discover what can increase the distance sound travels.</i>	1-2 Days	Materials: ● copy related files ● note cards ● card stock ● poster board ● paper towel roll ● plastic cup ● straw
EXPLORE: Explore 3:Engineering Solution-Let's Talk <i>Students design and construct an item that will use light and sound to communicate with other people over long distances.</i>	2 Day	Materials: ● copy related files ● clay ● craft sticks ● paper towel tubes ● construction paper ● tape ● flashlight
EXPLAIN & ELABORATE: Stemscopedia & Picture Vocabulary	2-3 Days	Pick 2 - 3 activities to extend concepts, consider adding voice and choice for students. Must Do: Stemscopedia & Picture Vocabulary (Whole Group)
EVALUATE: CER/ Open-Ended Response/Multiple Choice	1 day	<i>Complete CER.</i> <i>Use other assessments as needed.</i> See Anchoring Phenomena Event

Mission Anchor Chart Readdress the mission and display the anchor chart		Teacher Guide for anchor chart suggestions
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Engaging Scenario/Action Plan

Engaging Scenario/Action Plan

After the scopes are complete, students will use the information they gathered on the class Anchor Chart to help them complete their Action Plan. Briefly review the Anchor Chart. Students should complete the Action Plan as a group.

Action Plan:

Create a new form of communication

- It should use light and sound
- It should include using objects that affect how the light looks.

Unit 3: Design from Nature

Subject: Science

Grade: 1

Name of Unit: Design from Nature

Length of Unit: 32 Days

Overview of Unit: During this unit, students will be exploring many phenomena while learning the following concepts:

- Animals have external parts that help them grow, survive, and meet their needs.
- Plants have external parts that help them grow, survive, and meet their needs.
- Plants and animals respond to their environment in order to survive.

Anchoring Phenomena Event (to start the unit)

Students interact with a slow-motion video of a baby eating from a spoon.

Anchoring Phenomena Driving Question

How can humans learn from the way plants and animals use their external parts to survive?

Mission Performance Task (to end the unit)

Students will use what they learn about plant and animal structures to design a new tool.

The scopes included in this unit include the following:

- Parts of Animals
- Animal Survival
- Parts of Plants
- Plant Survival

Topic 1: Parts of Animals

Suggested Length of Time: 9 Days

Essential Questions (Student Wondering):

- How can humans learn from animals?

Enduring Understanding (Learning Objectives/Performance Expectations):

- The student is expected to 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.

Standards Addressed

Priority:

Missouri Learning Standards

- 1.LS1.A.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.

Disciplinary Core Ideas (DCI):

- 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 (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)

Supporting:

Crosscutting Concepts (CC)/ Science and Engineering Practices (SER):

- Constructing Explanations and Designing Solutions: Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1-1)
- Structure and Function The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)
- Connections to Engineering, Technology, and Applications of Science: Influence of Engineering, Technology, and Science on Society and the Natural World - Every human-made product is designed by applying some knowledge of the natural world and is built by using natural materials. (1-LS1-1)

Detailed Description/Instructions:

5 E's	Suggested # of Days	Notes
ENGAGE Investigative Phenomena- Video <i>Where can we get ideas for new products and inventions?</i> APK: Parts of Animals <i>Students make observations of four different animals and discuss what is covering each animal and why the covering is important to the animal.</i> Graphic Organizer- Animal Parts <i>Animal Pictured-Tell how animal parts help animals do different things.</i> Hook: Little Red Riding Hood <i>Students read "Little Red Riding Hood" story cards and identify animal characteristics from the story and how they can be used to help an animal survive.</i>	1 Day	Materials: ● copy related files ● books of real animals
EXPLORE Explore 1: Activity-Zoo Scavenger Hunt <i>Students identify external characteristics of animals and investigate how the feature is used by the animal to move, eat, or survive in its habitat</i>	1-2 Days	Materials: Zoo Animal Picture Cards, Zoo Animal Information Card, Student Journal

EXPLORE Explore 2: Activity Parts <i>Students will investigate the body parts of animals and how those body parts help animals see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air.</i>	1 Day-45 minutes	Materials: copy related files, binoculars, cups, cardstock, animal figurines, fabric swatches, sequined fabric, faux fur, feathers, slick and shiny materials, toothpicks, craft sticks, blocks of clay, paper plates, plastic bag
EXPLORE Explore 3: Activity-Animal Inventions <i>Students look at how inventors and engineers have studied these helpful animal parts and have figured out ways to help humans solve problems too</i>	1 Day	Materials: Human Invention Cards per group, Animal Cards per group, Animal Inspiration Cards, Student Journal
EXPLORE Explore 4: Engineering Solution-Helpful Animal Parts <i>Students will design and construct an item that will help people by applying their knowledge of animal parts.</i>	Optional	Materials: copy related files, tape, clay, string, paper towel tubes
EXPLAIN & ELABORATE Stemscopedia & Picture Vocabulary	2-3 Days	Pick 2 - 3 activities to extend concepts, consider adding voice and choice for students. Must Do Stemscopedia & Picture Vocabulary (Whole Group)
EVALUATE Assess: CER/Open-Ended Response/Multiple Mission Anchor Chart Readdress the mission and display the anchor chart	1 Day	<i>Complete CER.</i> <i>Use other assessments as needed.</i> See Anchoring Phenomena Event Teacher Guide for anchor chart suggestions

Topic 2: Animal Survival

Suggested Length of Time: 7 days

Essential Questions (Student Wondering):

- How do animals use their senses to survive?

Enduring Understanding (Learning Objectives/Performance Expectations):

- The student is expected to 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.

Standards Addressed

Priority:

Missouri Learning Standards

- *1.LS1.A.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*

Disciplinary Core Ideas (DCI):

- **LS1.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. (1-LS1-1)

Supporting:

Crosscutting Concepts (CC)/ Science and Engineering Practices (SER):

- **Constructing Explanations and Designing Solutions:** Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1-1)
- **Structure and Function** The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)
- **Connections to Engineering, Technology, and Applications of Science:** Influence of Engineering, Technology, and Science on Society and the Natural World
-Every human-made product is designed by applying some knowledge of the natural world and is built by using natural materials. (1-LS1-1)

Detailed Description/Instructions:

5 E's	Suggested # of Days	Notes
ENGAGE Investigative Phenomena-Video <i>How do animals use their senses to survive?</i> APK-Students choose between responses about why turtles hide inside their shells. Graphic Organizer-Animal Survival Needs	1 Day	Materials: copy related files, plastic bag, cotton fabric, lunch bag

<i>Describe how animals survive using the five senses.</i> Hook: Sense of Touch <i>Students explore how their sense of touch can help them make decisions.</i>		
EXPLORE Explore 1: Activity- Hmm... I'm Hungry! <i>Students use their sense of smell to identify substances that remind them of food versus smells that are unpleasant or dangerous.</i>	1 Day-45 minutes	Materials: 10-12 Plastic Containers, Sharpie, Cotton Balls, Foil, Rubber Bands, Reference STEMscopes for list of Food and Non-Food Smells, Student Journal
EXPLORE Explore 2: Activity-Survivor <i>Students match cards to discover ways animals use their body parts to respond to their environments to grow and survive.</i>	1 Day-45 minutes	Materials: copy related files, zip-loc bag
EXPLAIN Stemscopedia & Picture Vocabulary	2-3 Days	Pick 2 - 3 activities to extend concept, consider adding voice and choice for students. Must Do Stemscopedia & Picture Vocabulary (Whole Group)
EVALUATE Assess: CER/Open-Ended Response/Multiple Mission Anchor Chart Readdress the mission and display the anchor chart	1 Day	<i>Complete CER.</i> <i>Use other assessments as needed.</i> See Anchoring Phenomena Event Teacher Guide for anchor chart suggestions

Topic 3: Parts of Plants

Parts of Plants and Plant Survival both require additional items and planning ahead.

Suggested Length of Time: 9 days

Essential Questions (Student Wondering):

- How can humans learn from plants?

Enduring Understanding (Learning Objectives/Performance Expectations):

- The student is expected to 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.
- The student is expected to 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.

Standards Addressed

Priority:

Missouri Learning Standards

- 1.LS1.A.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

Disciplinary Core Ideas (DCI):

- 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 (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)

Supporting:

Crosscutting Concepts (CC)/ Science and Engineering Practices (SER):

- Constructing Explanations and Designing Solutions: Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1-1)
- Structure and Function The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)
- Connections to Engineering, Technology, and Applications of Science: Influence of Engineering, Technology, and Science on Society and the Natural World -Every human-made product is designed by applying some knowledge of the natural world and is built by using natural materials. (1-LS1-1)

Detailed Description/Instructions:

5 E's	Suggested # of Days	Notes
ENGAGE Investigative Phenomena- Video	1 Day	Materials: copy related files, hand lens, container, carrot

<i>What would happen if a plant had no roots?</i> APK: Parts of Plants <i>How does it get water?</i> Graphic Organizer- Busy Plants <i>Diagram-Label the job of each plant part</i> Hook: Dinner Time! <i>Students observe various vegetables, seeds, and fruits, and identify and describe their different parts.</i>		with leaves, broccoli, artichoke, spinach, lettuce, radish, celery, sunflower seeds, pumpkin seeds, apples, lemons, limes, oranges, tape, chart paper
EXPLORE Explore 1: Activity- Watch It Grow! <i>Students observe various vegetables, seeds, and fruits, and they identify and describe their different parts.</i>	1 Day	Materials: copy related files, hand lens, spray bottle, straws, pipe cleaner, paper flowers, bowl, spoon, bubble wrap, live plant, lima beans, other seeds, paper towel, plastic bag, packing tape, cup, apple, egg
EXPLORE Explore 2: Activity- Humans Mimicking Plants <i>Students look at how inventors and engineers have studied these helpful plant parts and have figured out ways to help humans solve problems.</i>	1 Day	Materials: Human mimicking plants, Human Invention Cards, student journal page,
EXPLORE Explore 3: Engineering Solution- Helpful Parts <i>Students will design and construct an item that will help people.</i>	1- 2 Days	Materials: Student Journal Page, paper towel tubes, toothpicks, clay, straws, craft sticks, construction paper, tape, cardboard boxes
EXPLAIN Stemscopedia and Picture Vocabulary and other activity	2-3 Days	Pick 2 - 3 activities to extend concept, consider adding voice and choice for students.(Consider completing as stations) Must Do Stemscopedia & Picture Vocabulary (Whole Group)
EVALUATE Assess: CER/Open-Ended Response/Multiple	1 Day	<i>Complete CER.</i> <i>Use other assessments as needed.</i>

Mission Anchor Chart Readdress the mission and display the anchor chart		See Anchoring Phenomena Event Teacher Guide for anchor chart suggestions
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Topic 4: Plant Survival

Suggested Length of Time: 7 Teaching Days (over 2 weeks of observations)

Essential Questions (Student Wondering):

- What helps plants survive?

Enduring Understanding (Learning Objectives/Performance Expectations):

- The student is expected to 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.
- The student is expected to analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Standards Addressed

Priority:

Missouri Learning Standards

- *1.LS1.A.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*

Disciplinary Core Ideas (DCI):

- **LS1.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. (1-LS1-1)

Supporting:

Crosscutting Concepts (CC)/ Science and Engineering Practices (SER):

- **Constructing Explanations and Designing Solutions:** Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1-1)
- **Structure and Function** The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)
- **Connections to Engineering, Technology, and Applications of Science:** Influence of Engineering, Technology, and Science on Society and the Natural World
-Every human-made product is designed by applying some knowledge of the natural world and is built by using natural materials. (1-LS1-1)

Detailed Description/Instructions:

5 E's	Suggested # of Days	Notes
ENGAGE Investigative Phenomena- Video <i>What helps plants survive?</i> APK-Lean On <i>Students look at the picture and read the child's</i>	1 Day	Materials: Print off a copy of Plant Survival

<i>opinion to decide whether they agree or disagree with why the tree is leaning.</i> Graphic Organizer- How Does a Plant Survive? <i>Record plants response to Changes in Temperature, Light and Water</i> Hook: <i>Students talk about the difference in the trees in the picture before learning that it is, in fact, the same tree.</i>		
EXPLORE Explore 1:Scientific Investigation -Growing Sideways <i>Students observe how a plant grows toward the Sun.</i>	1 Day (continue observation s for 1-2 weeks)	Plan Ahead: Plant seeds ahead of time to insure small sprout. You may plant grass seed or use a grown plant. Both items will need to be purchased. Materials: Plants, water, science journals, safe place to store plants outside
EXPLORE Explore 2: Scientific Investigation- Growing Spuds <i>Students will explore how potato sprouts behave in a warm, moist environment versus in a cold, dry environment.</i>	1 Day	Materials-Student Journals for recording concepts .
EXPLAIN & ELABORATE Stemscopedia, Picture Vocabulary & Reading Science	2-3 Days	Pick 2 - 3 activities to extend concept, consider adding voice and choice for students. Must Do Stemscopedia & Picture Vocabulary (Whole Group)
EVALUATE Assess: CER/Open-Ended Response/Multiple Mission Anchor Chart Readdress the mission and display the anchor chart	1 Day	<i>Complete CER.</i> <i>Use other assessments as needed.</i> See Anchoring Phenomena Event Teacher Guide for anchor chart suggestions

Engaging Scenario/Action Plan

Engaging Scenario/Action Plan

After the scopes are complete, students will use the information they gathered on the class Anchor Chart to help them complete their Action Plan. Briefly review the Anchor Chart. Students should complete the Action Plan as a group.

Action Plan:

Design a tool for a hardware company that uses plant or animal external parts or behaviors.

- Your tool should be useful for humans
- It should mimic the behavior or external parts of a plant or animal.

Unit 4: Parents and Their Offspring

This unit is also taught heavily in 5th grade. This is more of an exposure for 1st graders.

Subject: Science

Grade: 1

Name of Unit: Parents and Their Offspring

Length of Unit: 15 Days

Overview of Unit: During this unit, students will be exploring many phenomena while learning the following concepts:

- Animals of the same species are similar but can vary in many ways.
- Plants of the same type are similar but can vary in many ways.

Anchoring Phenomena Event (To start the unit)

Students interact with a video of a mother bear and her cub.

Anchoring Phenomena Driving Question

Do baby animals look exactly like their parents? Do new plants look exactly like the parent plant?

Mission Performance Task (To end the unit)

Students will apply their knowledge of trait inheritance and variation with plants and animals and of protective behaviors by writing a segment for a wildlife TV show.

The scopes included in this unit include the following:

- Animal Trait Inheritance and Variation
- Plant Trait Inheritance and Variation

Topic 1: Animal Trait Inheritance and Variation

Suggested Length of Time: 7 Days

Essential Questions (Student Wondering):

- Why do some animals not look like their parents?

Enduring Understanding (Learning Objectives):

- The student is expected to make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Standards Addressed

Priority:

Missouri Learning Standard

- 1.LS3.A.1 Make observations to construct an evidence based account that young plants and animals are like, but not exactly like, their parents.

Disciplinary Core Ideas (DCI):

- LS3.A: Inheritance of Traits: Young animals are very much, but not exactly, like their parents. Plants also are very much, but not exactly, like their parents. (1-LS3-1)
- LS3.B: Variation of Traits: Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1)

Supporting:

Crosscutting Concepts (CC)/ Science and Engineering Practices (SER):

- Constructing Explanations and Designing Solutions: Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1-LS3-1)
- Patterns Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS1-2),(1-LS3-1)

Detailed Description/Instructions:

5 E's	Suggested # of Days	Notes
ENGAGE Investigative Phenomena- Video <i>Why does an animal not look exactly like its mother?</i> APK: Students answer and discuss a series of questions on why baby animals look like their parents. Graphic Organizer- Why Do I Look Like My Parents? <i>Adult animal- identify a trait they might inherit and one they might not.</i> Hook: To Whom Do I Belong? <i>Students match adult and offspring picture cards together based on their traits and characteristics.</i>	1 Day	Materials: copy related files, timer, zip-loc baggie
EXPLORE Explore 1: Activity- BUGS! <i>Students create and observe how offspring differ by incorporating various traits from both the mother and farther bugs.</i>	1 Day	See STEMscopes for material list.
EXPLORE Explore 2: Activity- Are You My Parents? <i>Students match animal babies to their parents based on their traits.</i>	1 Day	Materials: 1 set of Animal Parent and Baby Cards per student, Student Journal
EXPLAIN & ELABORATE STEMscopedia & Picture Vocabulary	2-3 Days	Pick 2 - 3 activities to extend concepts,

		consider adding voice and choice for students. Must Do STEMscopedia & Picture Vocabulary (Whole Group)
EVALUATE CER/Open-Ended Response/Multiple Mission Anchor Chart Readdress the mission and display the anchor chart	1 Day	<i>Complete CER.</i> <i>Use other assessments as needed.</i> See Anchoring Phenomena Event Teacher Guide for anchor chart suggestions

Topic 2: Plant Trait Inheritance and Variation

Suggested Length of Time: 8 Days

Essential Questions (Student Wondering):

- Why do plants not look exactly like their parent plants?

Enduring Understanding (Learning Objectives):

- The student is expected to make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Standards Addressed

Priority:

Missouri Learning Standards

- 1.LS3.A.1 Make observations to construct an evidence based account that young plants and animals are like, but not exactly like, their parents.

Disciplinary Core Ideas (DCI):

- LS3.A: Inheritance of Traits: Young animals are very much, but not exactly, like their parents. Plants also are very much, but not exactly, like their parents. (1-LS3-1)
- LS3.B: Variation of Traits: Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1)

Supporting:

Crosscutting Concepts (CC)/ Science and Engineering Practices (SER):

- Constructing Explanations and Designing Solutions: Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1-LS3-1)
- Patterns Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS1-2),(1-LS3-1)

Detailed Description/Instructions:

5 E's	Suggested # of Days	Notes
ENGAGE Investigative Phenomena- Video <i>Why do plants not all look exactly like their parents?</i> APK: What Does It Look Like? <i>Students use yes.no sticky notes to respond to a series of questions on plant attributes.</i> Graphic Organizer-Plant Offspring <i>Chart- list some characteristics a plant offspring might inherit and those it might not.</i> Hook: Nature Walk <i>Students observe different plants and discuss the differences.</i>	1 Day	Materials: sticky notes, chart paper, pansy plants, planted grass, cactus plant

EXPLORE Explore 1: Activity- Plant Babies <i>Students make a model showing traits that can appear in offspring.</i>	1 Day	Materials: copy related files, tape, brown paper bags, construction paper, chart paper
EXPLORE Explore 2: Activity- Who Are My Parents? <i>Students observe images of plants and match offspring with parents.</i>	1 Day	Materials: Plant Cards, Offspring Cards, Student Journal, CER
EXPLAIN & ELABORATE Stemscopedia & Picture Vocabulary	2-3 Days	Pick 2 - 3 activities to extend concept, consider adding voice and choice for students. Must Do Stemscopedia & Picture Vocabulary (Whole Group)
EVALUATE CER/Open-Ended Response/Multiple Mission Anchor Chart Readdress the mission and display the anchor chart	1 Day	<i>Complete CER. Use other assessments as needed..</i> See Anchoring Phenomena Event Teacher Guide for anchor chart suggestions

Engaging Scenario/Action Plan

Engaging Scenario/Action Plan

After the scopes are complete, students will use the information they gathered on the class Anchor Chart to help them complete their Action Plan. Briefly review the Anchor Chart. Students should complete the Action Plan as a group.

Action Plan:

Write a segment for a new wildlife TV show based in Africa.

- It should describe how the offspring are the same and different from both parent animals.
- It should describe the plants in the area, and how they are alike and different.