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:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Timeframe</th>
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<tbody>
<tr>
<td>1. Earth and Space Science</td>
<td>4-5 weeks</td>
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<tr>
<td>● Topic 1: Patterns in Space</td>
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<tr>
<td>● Topic 2: Seasonal Patterns</td>
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<tr>
<td>2. Physical Science</td>
<td>7 weeks</td>
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<tr>
<td>● Topic 1: Sound</td>
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<td>● Topic 2: Behavior of Light</td>
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<td>● Topic 3: Communication</td>
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<tr>
<td>3. Life Science</td>
<td>12 weeks</td>
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<tr>
<td>● Topic 1: Parts of Animals</td>
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<td>● Topic 2: Parts of Plants</td>
<td></td>
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<tr>
<td>● Topic 3: Animal Survival</td>
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<td>● Topic 4: Plant Survival</td>
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<tr>
<td>● Topic 5: Animal Trait Inheritance and Variation</td>
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<tr>
<td>● Topic 6: Plant Trait Inheritance and Variation</td>
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</tbody>
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Curriculum Revision Tracking
Spring, 2018
● Emphasized and added Cross Cutting Concepts
● Reordered some scopes
● Prioritized lessons
Unit 1: Earth and Space

Subject: Science  
Grade: 1  
Name of Unit: Earth and Space Science  
Length of Unit: 20 days  
Overview of Unit:
The Earth and Space Unit is divided into two topics: Topic 1: Patterns in Space and Topic 2: Seasonal Patterns. In Topic 1, students will observe patterns of the sun, moon, and stars. They will be able to describe these patterns and make accurate relative predictions. In Topic 2, students will make seasonal observations and relate amounts of daylight to different times of the year.

Materials to Prepare for Unit:
- Teachers should prepare moon phase cards for small groups of students. It is suggested that teachers print, laminate and cut moon phase cards for reuse.
- Ask your school librarian or visit the public library to gather children’s books about the 4 seasons.

Topic 1: Patterns in Space

Suggested Length of Time: 9 days

Essential Questions (Student Wondering):
- How do you know that the Sun will rise and set tomorrow?

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/Disciplinary Core Ideas (DCI):
- 1-ESS1.A.1 - The Universe and its Stars: Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted.

Supporting/Crosscutting Concepts (CC)/ Science and Engineering Practices (SER):
- 1-ESS1-1 - Use observations of the sun, moon, and stars to describe patterns that can be predicted.
- Patterns in the World - Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.
- Observations- Use observations (firsthand or from media) to describe patterns and/or relationships in the natural and designed world(s) in order to answer scientific questions and solve problems.

Detailed Description/Instructions:
<table>
<thead>
<tr>
<th>Standard</th>
<th>5 E’s</th>
<th>Suggested # of Days</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-ESS1.A.1 Observations Patterns in the World</td>
<td>ENGAGE Essential Question Accessing Prior Knowledge &amp; Hook</td>
<td>1 Day</td>
<td>2 Activities *(Hook) Teacher uses globe and flashlight to model the position of the Earth and sun *(APK) Students Make a T-Chart for Day and Night By the end of this lesson students should be able to say what they see in the daytime versus the nighttime.</td>
</tr>
<tr>
<td>1-ESS1.A.1 Observations Patterns in the World</td>
<td>EXPLORE D1: Scientific Investigation</td>
<td>4 Days</td>
<td>Students make predictions and observations about sky during different times of the day for 4 days. Teacher will ask students about what they noticed about the sun each morning? What did they notice about the sky at noon? What they noticed about the sky each afternoon? Students can draw or write observations. Materials: Student journals By the end of this lesson students should be able to notice that there is a pattern in the sky with the sun and the moon at specific times in the day. CCC question: What patterns do you observe in the data you collected in your student journal?</td>
</tr>
<tr>
<td>1-ESS1.A.1 Observations Patterns in the World</td>
<td>EXPLORE D2: Activity</td>
<td>1 Day</td>
<td>In small groups students order the moon phase cards. Students will draw each moon phase card in their journals. Materials: copies of moon phase cards for small groups, student journals CER- formative assessment idea to be recorded in science notebook By the end of this lesson students should be able to notice a pattern in the phases of the moon. CCC question: What is the pattern you observed about the moon phases in your student journal? What happens at the end of the phases?</td>
</tr>
</tbody>
</table>
### Topic 2: Seasonal Patterns

**Suggested Length of Time:** 11 days  
**Essential Questions (Student Wondering):**
- Why does it get darker earlier in the winter?

**Enduring Understanding (Learning Objectives):**
- 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**  
*Disciplinary Core Ideas (DCI):*
- 1.ESS1.B.1-Earth and the Solar System: Seasonal patterns of sunrise and sunset can be observed, described, and predicted.

*Supporting (CC and SER):*
- 1-ESS1-2-Make observations at different times of year to relate the amount of daylight to the time of year.
- Patterns in the World-Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.
- Make Observations-Make observations (firsthand or from media) and/or measurements to collect data that can be used to make comparisons.

**Detailed Description/Instructions:**

<table>
<thead>
<tr>
<th>Observations</th>
<th>EXPLAIN &amp; ELABORATE Stemscopedia &amp; Picture Vocabulary</th>
<th>2 -3 Days</th>
<th>Pick 2 - 3 activities to extend concept, consider adding voice and choice for students. Must Do StemScopedia and Picture Vocabulary (Whole Group) Recommended: Content Connection Video 1, Content Connection Video 2, and Content Connection Video 3 Optional: Math Connection,, Science Rock Interactive By the end of this lesson students should be able to integrate the vocabulary in their everyday language.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-ESS1.A.1 Observations</td>
<td>EVALUATE Assess: CER/ Open-Ended Response/Multiple Choice</td>
<td>1 Day</td>
<td>Complete CER. Other assessments optional.</td>
</tr>
<tr>
<td>Standard</td>
<td>5 E’s</td>
<td>Suggested # of Days</td>
<td>Notes</td>
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<tr>
<td>1.ESS1.B.1 Make Observations Patterns in the World</td>
<td>ENGAGE Essential Question Prior Knowledge &amp; Hook</td>
<td>1 Day</td>
<td>2 Activities: Accessing Prior Knowledge: Students write/draw what they would wear or use for each season. Hook: Teacher shares activities that happen during the day or night. Students hold up day and night signs accordingly. (Example activities that teacher may share: going to school, seeing fireworks) -Materials: Student journals and Day or Night?-signs By the end of this lesson students should be able to recognize that different seasons and different times of the day, impact everyday choices.</td>
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<tr>
<td>1.ESS1.B.1 Make Observations Patterns in the World</td>
<td>EXPLORE D1:Scientific Investigations</td>
<td>2 Days</td>
<td>For this activity, teacher must gather a year’s worth of data on the number of daylight hours for their city and for a city in the opposite hemisphere. Examples: Kansas City and Australia. Students will record sunset and sunrise data throughout the course of a year. Students will notice the patterns that are formed each day and make observations that different places have each seasons during different times of the year because of their position on Earth. Website to access data: <a href="http://www.sunrisesunset.com/USA/Missouri.asp">http://www.sunrisesunset.com/USA/Missouri.asp</a> Questions to ask students: What months had the most amount of daylight? What months had the least amount of daylight? What months fall within each season? Materials: student journal, Day and Night Google doc, CER- formative assessment idea to be recorded in science notebook. By the end of this lesson students should be able to see a pattern in the hours of daylight for each season and then compare to a city in</td>
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</table>
| 1.ESS1.B.1 Make Observations Patterns in the World | EXPLORE D2: Research | 3-4 Days | Students will conduct research about the seasons and then create a poster within a small group. Prior to the lesson, teacher must gather various seasonal weather material. Teacher choice: students can research independently or complete whole group read alouds with the teacher. (books, e-books, etc.). After completing each poster, students will present their knowledge of the seasons to the whole class. *Pebble Go has videos and short readings about each of the four seasons. Students could create a Google or PowerPoint Presentation instead of designing a poster. 

*By the end of this lesson students should be able to work with a group to describe the characteristics of each season.* |
|---|---|---|---|
| 1.ESS1.B.1 Make Observations Patterns in the World | 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 and Picture Vocabulary (Whole Group)* 
*Recommended: Content Connection Video 1 & 2* 
*Optional: Math Connection, Science Rock Interactive* 

*By the end of this lesson students should be able to integrate the vocabulary in their everyday language.* |
| 1.ESS1.B.1 Patterns in the World | EVALUATE Assess: CER/ Open-Ended Response/Multiple Choice | 1 Day | *Complete CER. Other assessments optional.* |
Engaging Scenario: Patterns in the Sky

Engaging Scenario Patterns in the Sky: For Part II, students will analyze and discuss the sunlight patterns for Portland, Oregon within each season. As a class, students will graph the results and answer questions accordingly.

Rubric for Engaging Scenario:

Part II: Make Observations at Different Times (1-ESS1-2)
The student predicts that the data will show summer as having much sunlight and winter as having little. The student observes from the pictograph that sunlight increases during the spring and summer and then decreases during the fall and winter. The student tells how the length of the day will be observed and recorded. The student accurately compares the amount of seasonal sunlight in his city to that of Portland, Oregon.

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<td>The student fails to address the purpose of the assignment.</td>
<td>The student attempts to address the purpose of the assignment, but is unsuccessful.</td>
<td>The student does a decent job of addressing the purpose of the assignment.</td>
<td>The student does a very good job of addressing the purpose of the assignment.</td>
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Unit 2: Physical Science

Subject: Science  
Grade: 1st  
Name of Unit: Physical Science  
Length of Unit: 32 days  

Overview of Unit:
The Physical Science Unit is divided into three topics: Topic 1: Sound, Topic 2: Behavior of Light, and Topic 3: Communication. In Topic 1, students will be able to observe and record how sound is made. Students will also create and design an instrument that creates sounds. In Topic 2, students will understand the concept of reflection and how it affects light movement. In Topic 3, students will use light or sound to solve a problem of communicating over distance.

Materials to Prepare for the Unit:
- Teachers should order a purchase order for greeting card and rice for Sound Do 1 Activity.
- Teachers should communicate to parents materials needed for students make instruments. Example: toilet paper rolls, Kleenex boxes, aluminum cans, milk jugs, etc.
- Teachers should make three cardstock frames per group, one with wax paper, one with plastic wrap, and one with black construction paper on the inside. Number and label the frames: Frame 1 - Wax Paper, Frame 2 - Plastic Wrap, and Frame 3 - Construction Paper.

Topic 1: Sound

Suggested Length of Time: 9 days  
Essential Questions (Student Wondering):
- How do drums and guitars make sound?

Enduring Understanding (Learning Objectives):
- 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.

Standards Addressed
  
  Priority (DCI):
  - 1-PS4.A.1-Wave Properties: Sound can make matter vibrate, and vibrating matter can make sound.
  
  Supporting (CC and SER):
  - 1-PS4-1-Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.
  - Simple Tests-Simple tests can be designed to gather evidence to support or refute student ideas about causes.
  - Collaborative Investigation-Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.

Detailed Description/Instructions:
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</table>
| 1-PS4.A.1 Collaborative Investigation Simple Tests | ENGAGE Essential Question Accessing Prior Knowledge & Hook | 1 Day               | 2 Activities  
- Stopwatch Sound: In this activity, students write down as many things that make a sound as they can. Then, while touching their throat, students say their name and share what they feel.  
- Laser Show: Students observe and describe what happens to a laser light when a vibrating tuning fork is placed on it.  
Materials: Student Journals, Laser, Tuning Fork  
*By the end of this lesson students should be able to understand that a sound is created by movement.* |
Students visit four stations to observe and record how sound is made.  
*By the end of this lesson students should be able to further develop their knowledge that sound is created by movement.*  
*CCC question: What patterns do you observe at each of the sound stations? Does the pattern in the data support the conclusions that sound is related to vibration? Why or why not?* |
| 1-PS4.A.1 Collaborative Investigation Simple Tests | EXPLORE D2: PBL                                | 2 Days              | Rock Out: Students design and make an instrument that makes sound within a small group. Each student will be assigned a specific role in the design process. Groups will then perform with their musical instrument.  
See STEMscope material list.  
*By the end of this lesson students should be able to design an instrument that produces sound and explain how the sound is created by vibrating matter.* |
**1-PS4.A.1 Collaborative Investigation Simple Tests**

<table>
<thead>
<tr>
<th>EXPLAIN &amp; ELABORATE Stemscopedia &amp; Picture Vocabulary</th>
<th>2-3 Days</th>
<th>Pick 2 - 3 activities to extend concept, consider adding voice and choice for students. Must Do: STEMscopedia &amp; Picture Vocabulary (Whole Group) Recommended: Content Connection Videos 1 &amp; 2 Optional: Math Connection, Extensions, Linking Literacy By the end of this lesson students should be able to integrate the vocabulary in their everyday language.</th>
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</table>

| EVALUATE: CER/ Open-Ended Response/Multiple Choice | 1 Day | Complete CER. Use other assessments as needed. |

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**Topic 2: Behavior of Light**

**Suggested Length of Time: 10 days**

**Essential Questions (Student Wondering):**
- Why can’t we see in the dark?

**Enduring Understanding (Learning Objectives):**
- The student is expected to make observations to construct an evidence-based account that objects can be seen only when illuminated.
- The student is expected to plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.

**Standards Addressed**

*Priority (DCI):*
- 1-PS4.B.1-Electromagnetic Radiation: Objects can be seen if light is available to illuminate them or if they give off their own light.
- 1-PS4.B.2-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. (Boundary: The idea that light travels from place to place is developed through experiences with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.)

*Supporting (CC and SER):*
- 1-PS4-2-Make observations to construct an evidence-based account that objects can be seen only when illuminated.
1-PS4-3-Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light

- Simple Tests-Simple tests can be designed to gather evidence to support or refute student ideas about causes.
- Make Observations-Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.

**Detailed Description/Instructions:**

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<th>Standard</th>
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<th>Notes</th>
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<tbody>
<tr>
<td>1-PS4.B.2</td>
<td>ENGAGE: Essential Question Accessing Prior Knowledge and Hook</td>
<td>1 Day</td>
<td>2 Activities:</td>
</tr>
<tr>
<td>1-PS4.B.1</td>
<td></td>
<td></td>
<td>- Behavior of Light: In this activity, students observe three different containers and make observations about their characteristics.</td>
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<tr>
<td>Phenomenon</td>
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<td>- I See the Light: Students explore the importance of light through drawing with no light, full light, and glow light.</td>
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<tr>
<td>Explanations</td>
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<td>Materials: Student Journal, glow stick</td>
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<tr>
<td>Relationships</td>
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<td>By the end of this lesson students should be able to understand that they are able to see better with light and that light is able to travel through some objects and not others.</td>
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<tr>
<td>1-PS4.B.2</td>
<td>EXPLORE: D1: Activity</td>
<td>1 Day</td>
<td>Students listen to the fable “A Dog and His Bone”. Explore with mirrors and how they are used.</td>
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<tr>
<td>1-PS4.B.1</td>
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<td>Materials: Student Journal, fable, mirrors</td>
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<tr>
<td>Phenomenon</td>
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<td>By the end of this lesson students should be able to understand that reflection is created with a mirror and light.</td>
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<td>Explanations</td>
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<td>Relationships</td>
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<td><strong>CCC question:</strong> What do you predict would happen if light hit a different shiny surface like stainless steel? What do you think would happen if light hit a different surface like dirt?</td>
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<tr>
<td>1-PS4.B.2</td>
<td>EXPLORE: D2: Activity</td>
<td>1 Day</td>
<td>Star Qualities-Students will see how light changes direction as a reflection in a mirror</td>
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<td>1-PS4.B.1</td>
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<tr>
<td>Phenomenon</td>
<td>Explanations Relationships</td>
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<td>1-PS4.B.2</td>
<td>EXPLORE: D3: Scientific Investigation</td>
<td>2 Day</td>
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<td>1-PS4.B.1</td>
<td>The student explores different ways that light behaves. Part 1 Shine On/Day 1 Part 2 To Be Seen or Not Seen/Day 2 Materials: Teachers will create 3 frames prior.</td>
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<td><em>By the end of this lesson students should be able to state an object that light goes through, light does not go through, and that light is cloudy (light behavior).</em></td>
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<tr>
<td>1-PS4.B.2</td>
<td>EXPLAIN &amp; ELABORATE: Stemscope &amp; Picture Vocabulary</td>
<td>2-3 Days</td>
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<tr>
<td>1-PS4.B.1</td>
<td>Pick 2 - 3 activities to extend concept, consider adding voice and choice for students. <em>Must Do: Stemscope &amp; Picture Vocabulary (Whole Group)</em> <em>Recommended: Content Connection Videos 1 &amp; 2</em> <em>Optional: Math Connection, Extensions, Linking Literacy</em></td>
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<tr>
<td>1-PS4.B.2</td>
<td>EVALUATE: CER/ Open-Ended Response/Multiple Choice</td>
<td>1 Day</td>
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<tr>
<td>1-PS4.B.1</td>
<td>Complete CER. Use other assessments as needed.</td>
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**Topic 3: Communication**

**Suggested Length of Time:** 13 days

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*Board Approved: June 7, 2018*
Essential Questions (Student Wondering):
- How do lighthouses communicate to ships and boats?

Enduring Understanding (Learning Objectives):
- 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.

Standards Addressed

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

Supporting (CC and SER):
- 1-PS4-4-Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.
- Specific Problems-Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem.

Detailed Description/Instructions:

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</table>
| 1-PS4.C.1  | ENGAGE: Essential Question Accessing Prior Knowledge and Hook        | 1 Day               | 2 Activities
- Form of Communication or Not? In this activity, students respond with either a thumbs up or a thumbs down when asked if an image represents a form of communication.
- How do We Communicate? Students are introduced to and discuss the different ways we communicate.
Materials: Student Journal, communication device cards, bar graph
By the end of this lesson students should be able to identify various forms of communication and discuss different ways to communicate. |
| Specific Problems | EXPLORE: D1:Activity | 1-2 Days              | Talking with Lights: Learn and Implement Morse Code
Materials: Flashlight, dark paper, Student Journal
CER- formative assessment idea to be recorded in science notebook
By the end of this lesson students should be able to understand that one can communicate with light (other form than just vocal communication.) |
<table>
<thead>
<tr>
<th>1-PS4.C.1 Specific Problems</th>
<th>1-PS4.C.1 Specific Problems</th>
<th>1-PS4.C.1 Specific Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EXPLORE:</strong> D2:PBL</td>
<td><strong>EXPPLAIN &amp; ELABORATE:</strong> Stemscopedia &amp; Picture Vocabulary</td>
<td><strong>EVALUATE:</strong> CER/ Open-Ended Response/Multiple Choice</td>
</tr>
<tr>
<td>1-2 Days</td>
<td>2-3 Days</td>
<td>1 day</td>
</tr>
<tr>
<td>Did You Hear What I Said?</td>
<td>Pick 2 - 3 activities to extend concept, consider adding voice and choice for students. <strong>Must Do: Stemscopedia &amp; Picture Vocabulary</strong> (Whole Group) <strong>Recommended:</strong> Students can send an email to another student as a form of communication. <strong>Content Connection Videos 1 &amp; 2</strong> <strong>Optional: Math Connection, Extensions, Linking Literacy</strong> By the end of this lesson students should be able to understand and explain keys concepts about Communication.</td>
<td>Complete CER. Use other assessments as needed.</td>
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**Engaging Scenario**

**Engaging Scenario:** Communicating with Waves: Students will plan and use different ways to send messages using both light and sound. For Part I, students will be presented with a problem in which they must communicate using flashlights and materials to shine shapes on a wall. For Part II, students will work in pairs to observe, communicate, and discuss the success
Communicating with Waves

Part I: Conduct a Light Investigation (1-PS4-3)
The student explains what happens when different materials are placed in front of the flashlight. The student describes how materials allow different amounts of light to pass through. The student identifies a material that allows all light to pass through, some light to pass through, and no light to pass through.

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<tr>
<td></td>
<td>The steps described in the plan are not logical or feasible and neither are the materials.</td>
<td>The majority of the materials or steps described in the plan are neither feasible nor logical.</td>
<td>Some of the materials or steps described in the plan are neither feasible nor logical.</td>
<td>All of the materials and steps in the investigation plan are feasible and logical.</td>
</tr>
</tbody>
</table>

Part II: Make Observations About Light (1-PS4-2)
The student explains that the flashlight must be turned on and the shape placed in front of the light so that the shape appears in the dark. The student makes observations about the appearance of their shape. The student explains what would happen if the flashlight battery ran out.

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<td>Student observations are highly accurate. They are very relevant to the purpose of the communication.</td>
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Unit 3: Life Science

Subject: Science
Grade: 1
Name of Unit: Life Science
Length of Unit: 47 Days
Overview of Unit:
The Life Science Unit is divided into 6 Topics: Topic 1: Parts of Animals, Topic 2: Parts of Plants, Topic 3: Animal Survival, Topic 4: Plant Survival, Topic 5: Animal Trait Inheritance, and Topic 6: Plant Trait Inheritance. In Topics 1-4, 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. In Topic 5 and 6, students will make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Materials to Prepare for the Unit:
- For Parts of Animals, teachers should gather a class set of toilet paper rolls for Do Activity 1.
- For Parts of Plants, teachers should gather a class set of paper towel rolls for Do Activity 3.
- For Plant Survival Unit, teacher should plant seeds approximately 1-2 weeks ahead of time to ensure small sprout growth for Do Activity 1. Teacher should plant enough seeds for each small group to have their own plant to observe.
- For Plant Trait Inheritance Hook, teacher will need to redeem the STEMscopes coupon for the “live material” two weeks prior to the implementation of the Hook Lesson.

Topic 1: Parts of Animals

Suggested Length of Time: 9 Days
Essential Questions (Student Wondering):
- Why do some animals have tails and others do not?

Enduring Understanding (Learning Objectives):
- 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 (DCI):
- 1-LS1.A.1 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.

Supporting (CC and SER):
- 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.
- Shape and Stability-The shape and stability of structures of natural and designed objects are related to their function(s).
- Specific Problems-Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem.

### Detailed Description/Instructions:

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| 1-LS1.A.1: Structure and Function | ENGAGE | 1 Day | 2 Activities:  
- Observation of animal coverings-print out student journal  
- Read “Little Red Riding Hood” and discuss the animal characteristics and how they help animals survive-independent small group research of other animal characteristics  

*By the end of this lesson students should be able to identify animal characteristics and how they can be used to help animals survive.*

Part 2: Materials: Zoo Animal Picture Cards, Zoo Animal Information Card, Student Journal Students make observations about the animal based on the picture  
Part 3: Students choose another animal to share with a peer.  

*By the end of this lesson students should be able to identify external characteristics of animals and how these characteristics are used to help animals survive.*

**CCC question:** How do you think your animal’s parts would work together to help it eat, move, and survive if its environment was changed?
| 1-LS1.A.1: Structure and Function | EXPLORE D2: Activity | 1 Day-45 minutes | Super Animal: Students visit 5 stations with a focus on different animal characteristics. Students design an animal to fit a habitat. Completed in small groups. Materials: Habitat Cards, Animal Parts Poster, Animal Parts Pieces, Student Journal

*By the end of this lesson students should be able to create an animal that would survive in the chosen habitat.*

**CCC question:** How do the parts of your animal work together?

| 1-LS1.A.1: Structure and Function | EXPLORE D3: Activity | 1 Day | Animal Inventions: Students look at how inventors and engineers have studied these helpful animal parts and have figured out ways to help humans solve problems too. Completed in small groups. Materials: Human Invention Cards per group, Animal Cards per group, Animal Inspiration Cards, Student Journal

*By the end of this lesson students should be able to look at how inventors and engineers have studied animal parts and how they figured out ways to help humans solve problems too.*

**CCC question:** What are the relationships between structure and function in your animal invention?

| 1-LS1.A.1: Structure and Function | 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) & Reading Science**

**Recommended:**

Content Connection Video 1 & 2

| | EVALUATE Assess: CER/Open-Ended Response/Multiple | 1 Day | Complete CER. Use other assessments as needed. |
Topic 2: Parts of Plants

Suggested Length of Time: 9 days

Essential Questions (Student Wondering):
- What would happen if a plant had no roots?

Enduring Understanding (Learning Objectives):
- 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 (DCI):
- 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.

Supporting (CC and SER):
- Shape and Stability The shape and stability of structures of natural and designed objects are related to their function(s).
- Specific Problems Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem.
- 1-LS1.A.2 Structure and Function: Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.

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<td>1-LS1.A.2 Structure and Function:</td>
<td>ENGAGE Essential Question Accessing Prior Knowledge &amp; Hook</td>
<td>1 Day</td>
<td>Part 1: Parts of Plants- Divide students into small groups and assign plant part. Within groups, students draw part of plant and describe plant part’s purpose in student journal. Part 2: Flowers, Stems, Leaves and Roots- Display a picture of a flower with roots. Discuss different parts of plant. Sing parts of plant to the tune of “head, shoulders, knees and toes” By the end of this lesson students should be able to identify plant parts and justify their purpose. Students will also be able to sing a song about plant parts.</td>
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<tr>
<td>1-LS1.A.2 Structure and D1 Activity</td>
<td>EXPLORE</td>
<td>1 Day</td>
<td>Plan Ahead: Gather fresh fruits and vegetables. Notify parents for allergies and volunteering consumables.</td>
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<td>Function:</td>
<td>Students observe various vegetables, seeds, and fruits, and identify and describe their different parts. Materials: student journal and fresh produce, chart labeled “What Part is Edible”, notecards labeled roots, stem, flower, seeds. <em>By the end of this lesson students should be able to observe various vegetables, seeds, fruits, and identify and describe their different parts.</em> <strong>CCC question: What is the function of each plant structure?</strong></td>
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<td>1-LS1.A.2 Structure and Function</td>
<td>EXPLORE D2 Activity</td>
<td>1 Day</td>
<td>Plan Ahead: Print off Human Invention Cards for small groups. Students look at how inventors and engineers have studied these helpful plant parts and have figured out ways to help humans solve problems. Materials: Human Invention Cards, student journal page, CER page. <em>By the end of this lesson students should be able to investigate plant parts like engineers, helping them to solve human problems.</em></td>
</tr>
<tr>
<td>1-LS1.A.2 Structure and Function</td>
<td>EXPLORE D3 Activity Engineering Solutions</td>
<td>1-2 Days</td>
<td>Using what they have learned about plant and animal parts, students design an item that will help people. Students present inventions. Materials: Student Journal Page, CER. <em>By the end of this lesson students should be able to design an everyday item that will help people.</em></td>
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<tr>
<td>1-LS1.A.2 Structure and Function</td>
<td>EXPLAIN Stemscopedia and Picture Vocabulary and other activity</td>
<td>2-3 Days</td>
<td>Pick 2 - 3 activities to extend concept, consider adding voice and choice for students.(Consider completing as stations) <strong>Must Do Stemscopedia &amp; Picture Vocabulary (Whole Group)</strong> <strong>Recommended:</strong> <em>Content Connection Video 1 &amp; 2</em> <strong>Optional:</strong> Math Connection, Career Connection, Science Today, Science.</td>
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By the end of this lesson students should be able to understand and describe plant parts.

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<td>1-LS1.A.2 Structure and Function</td>
<td>EVALUATE Assess: CER/Open-Ended Response/Multiple</td>
<td>1 Day</td>
<td>Complete CER. Use other assessments as needed.</td>
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**Topic 3: Animal Survival**

**Suggested Length of Time:** 7 days

**Essential Questions (Student Wondering):**
- How can animals catch their prey (food) in the dark?

**Enduring Understanding (Learning Objectives):**
- 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 (DCI):**
- 1-LS1.D.1 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.

**Supporting (CC and SER):**
- 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.
- Shape and Stability: The shape and stability of structures of natural and designed objects are related to their function(s).
- Specific Problems: Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem.

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<td>1-LS1.D.1 Information Processing</td>
<td>ENGAGE Essential Question Accessing Prior Knowledge &amp; Hook</td>
<td>1 Day</td>
<td>2 Activities: Class Discussion on Animal Survival and use of Senses-Students may record answers in Student</td>
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</table>
| 1-LS1.D.1 Information Processing | EXPLORE D1: Activity *Attention to Student Allergies | 1 Day-45 minutes | Students use their sense of smell to identify substances that remind them of food versus smells that are unpleasant or dangerous. Completed in small groups or pairs. Materials: 10-12 Plastic Containers, Sharpie, Cotton Balls, Foil, Rubber Bands, Reference STEMscopes for list of Food and Non-Food Smells, Student Journal

*By the end of this lesson students should discuss with a partner the senses that are required for an animal’s survival.*

| 1-LS1.D.1 Information Processing | EXPLORE D2: PBL *Substantial Preparation | 1 Day-45 minutes | Students design a bed for an animal that provides comfort and safety. The students create a model of the bed using materials that can be found in the animals’ habitat. Each student will be assigned a role within the group: Team Leader, Zoologist, Botanist, and Builder. Groups will then present their findings to the class. Reference STEMscope Website for detailed material list.

*By the end of this lesson students should be able to identify food smells versus harmful smells.*

| 1-LS1.D.1 Information Processing | 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) & Reading Science**

**Recommended:**
- Content Connection Video 1 & 2
Topic 4: Plant Survival

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

Essential Questions (Student Wondering):
- Why do plants turn towards the light?

Enduring Understanding (Learning Objectives):
- 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 (DCI):
  - 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.
  - 1-LS1.D.2- Information Processing: Plants also respond to some external inputs.

  Supporting (Supporting CC and SER):
  - Shape and Stability: The shape and stability of structures of natural and designed objects are related to their function(s).
  - Specific Problems- Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem.

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<td>1-LS1.D.1 Information Processing</td>
<td>ENGAGE Essential Question Assessing Prior Knowledge and Hook</td>
<td>1 Day</td>
<td>Plan Ahead: Print and cut Plant Picture Cards 2 Activities -Plant Survival: In this activity, students form groups and go through a list of questions that discuss plant adaptations. -Plant Characteristics: In this activity, the students observe how a plant's characteristics can help it survive. Materials: Print off a copy of Plant Survival By the end of this lesson students should be</td>
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<td>1-LS1.D.1 Information Processing</td>
<td>EXPLORE D1: Science Investigation Activity</td>
<td>1 Day (continue observations for 1-2 weeks)</td>
<td>able to identify plants and how they are able to adapt and how the characteristics of each plant help it survive.</td>
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<td>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. In this investigation, students observe how a plant grows toward the Sun. Students make observations every 2 days. Teacher should allow time for students to make observations for the next 1-2 weeks within their science journal. Materials: Plants, water, science journals, safe place to store plants outside By the end of this lesson students should be able to explain why a plant grows towards the sun. <strong>CCC question:</strong> What do you think would happen if the soil was secured with a special lid and the plant was hung upside down over the window sill? Why do you think your prediction is correct?</td>
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<tr>
<td>1-LS1.D.1 Information Processing Shape and Stability</td>
<td>EXPLORE D2: Engineering Solutions Activity</td>
<td>1 Day</td>
<td>Solar Energy: Students within groups, design a solution that helps maximize the collection of solar energy for a building using solar panels. Groups will present their findings to the class. Presentation Prompts: What do plants do when they are not facing the sun? How did this help you solve the problem? Are there any possible problems with your solution? Materials-Student Journals for recording concepts By the end of this lesson students should be able to design a solution that helps maximize the collection of solar energy for a building using solar panels.</td>
</tr>
<tr>
<td>1-LS1.D.1 Information ELABORATE</td>
<td>2-3 Days</td>
<td>Pick 2 - 3 activities to extend concept, consider adding voice and choice for</td>
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<td>EVALUATE</td>
<td>1 Day</td>
<td>Complete CER. Use other assessments as needed.</td>
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### Topic 5: 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 (DCI):**  
- 1. LS3.A.1-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.B.1-Variation of Traits: Individuals of the same kind of animal are recognizable as similar but can also vary in many ways.  
**Supporting (CC and SER):**  
- 1-LS3-1-Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.  
- Patterns in the World-Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.  
- Make Observations-Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.

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| 1.LS3.A.11 Inheritance of Traits | ENGAGE Essential Question Accessing Prior Knowledge & Hook | 1 Day               | 2 Activities:  
  * Students answer and discuss a series of questions on why baby animals look like their parents. *Project Animal Trait and Inheritance Document on SmartBoard.  
  * Students match family picture cards together based on their traits and characteristics. *You can use staff member photos or the ones provided by STEMscopes.  
  **By the end of this lesson students should be able to answer and discuss a series of questions on why baby animals look like their parents.** |
| 1.LS3.A.11 Inheritance of Traits | EXPLORE D1: Activity *View Glyph prior to activity | 1 Day               | Bugs-Students create and observe how offspring differ by incorporating various traits from both mother and father bugs. Completed individually or in table groups. You will need a class trait anchor chart. See STEMscopes for material list.  
  **By the end of this lesson students should be able to**  
  **CCC question: What are some similarities and differences among the bugs your class created?** |
| 1.LS3.A.11 Inheritance of Traits | EXPLORE D2: Activity | 1 Day               | Are You My Parents?-Students match animal babies to their parents based on their traits. Materials: 1 set of Animal Parent and Baby Cards per student, Student Journal CER- formative assessment idea to be recorded in science notebook.  
  **By the end of this lesson students should be able to observe how offspring differ by incorporating various traits from both mother and father bugs.**  
  **CCC question: What does the pattern of data that you saw from the dogs and** |
### Topic 6: Plant Trait Inheritance and Variation

**Suggested Length of Time:** 8 Days  
**Essential Questions (Student Wondering):**  
- Why do plants look so much 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 (DCI):**  
- 1-LS3.A.2-Inheritance of Traits: Plants are also very, much but not exactly, like their parents.  
- 1-LS3.B.2-Variation of Traits: Individuals of the same kind of plant are recognizable as similar but can also vary in many ways.  
**Supporting (CC and SER):**  
- 1-LS3-1-Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.  
- **Patterns in the World**-Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.  
- **Make Observations**-Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.

| 1.LS3.A.11 Inheritance of Traits | 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)**  
**Recommended:**  
Content Connection Video 1 & 2  
**Optional:** Math Connection, Career Connection, Science Today, Science Rock  

| 1.LS3.A.11 Inheritance of Traits | EVALUATE CER/Open-Ended Response/Multiple | 1 Day | Complete CER.  
Use other assessments as needed.  

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*puppies allow you to conclude about dog parents and puppy offspring?*
**Detailed Description/Instructions:**

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| ENGAGE   |       | 1 Day               | 2 Activities:  
|          |       |                     | ● Students use yes and no sticky notes to respond to a series of questions on plant attributes. Project “What Does It Look Like?” Document on the SmartBoard.  
|          |       |                     | ● Students observe different plants and discuss. Students will need their journal. *Don’t forget to redeem your coupon. See top for details.  
|          |       |                     | *By the end of this lesson students should be able to observe and describe different plant attributes.* |
|          | EXPLORE D1: Activity | 1 Day | Plan Ahead: Print and cut Plant Sort Picture Cards  
| 1-LS3.A.2 |       |                     | Plant Sort- Students sort picture cards of plants into different categories. Discuss plant similarities and differences.  
| 1. LS3.B.2 |       |                     | Materials: Plant Sort Cards, Student journal  
| Patterns in the World Make Observations |          |                     | *By the end of this lesson students should be able to sort plants by various plant attributes.*  
|          |       |                     | **CCC question:** Which plants did you group together? Why? How are the plants in the group similar? |
|          | EXPLORE D2: Scientific Investigation | 1 Day | Plant Babies-Students make a model showing traits that can appear in offspring.  
| 1-LS3.A.2 |       |                     | Materials: Set of Plant Parts Templates-You will need a class set of each plant part, brown paper bags labeled, white construction paper per student, chart paper  
| 1. LS3.B.2 |       |                     | Students will record findings in Student Journal as well as CER answers.  
<p>| Patterns in the World |          |                     | <em>By the end of this lesson students should be able to create a model showing possible plant traits that can appear in offspring.</em> |</p>
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<th><strong>CCC question:</strong> Here are the two parent plants. They are both the same species (kind) of plant. What are some similarities and differences between the parent plants?</th>
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| 1-LS3.A.2  
1.LS3.B.2  
Patterns in the World | EXPLORE D3: Activity | 1 day | Plan Ahead: Print and cut Parent and Offspring Picture Cards  
Who Are My Parents?-Students observe images of plants and match offspring with parents. Students discuss how they knew which plants were parents and which were offspring.  
Materials: Plant Cards, Offspring Cards, Student Journal, CER  
By the end of this lesson students should be able to match plant parents to their plant offspring. |
| **CCC question:** What do you predict would happen if two of the offspring flowers became parents of a new flower? |
| 1-LS3.A.2  
1.LS3.B.2  
Patterns in the World | 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)**  
**Recommended:**  
Content Connection Video 1 & 2  
By the end of this lesson students should be able to understand and describe plant traits and inheritance. |
| 1-LS3.A.2  
1.LS3.B.2  
Patterns in the World Make | EVALUATE CER/Open-Ended Response/Multiple | 1 Day | Complete CER.  
Use other assessments as needed. |

**Engaging Scenario**
**Engaging Scenario**: Parents and Their Offspring: Students will explain that the offspring of orangutans look similar to their parents. Please note that Part I of the Performance Expectation Assessment Task will not be included within this Engaging Scenario. Only Part II will be assessed. For Part II, students will circle the baby orangutan that goes with its mother as well as explain (verbally or written) two reasons why they go together. Prior to the Engaging Scenario, the teacher needs to find both texts and visual aids about Orangutan Mother Baby Relationship. Students will record answers in Student Journals.

**Rubric for Engaging Scenario:**

**Parents and Their Offspring**

**Part I: Caring for the Young**

The student draws or writes two ways the orangutan mother helps her baby survive.

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**Part II: Mom and Baby**

The student matches the orangutan parent and orangutan baby. The student writes or draws two logical reasons for selecting the orangutan baby.

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<td><strong>The resources do not provide accurate/valid information. The information is not relevant to the purpose of the communication.</strong></td>
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