

Unit 1 - Structure and Properties of Matter	Grade 2	Days - 13
<p><b>Standards:</b>  Students who demonstrate understanding can:</p> <p><b>2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.</b> [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]</p> <p><b>2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.*</b> [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.]</p> <p><b>2-PS1-3. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.</b> [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.]</p> <p><b>2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.</b> [Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.]</p>		
<p><b>Anchoring Question:</b></p>		
<ul style="list-style-type: none"> <li>● How can matter in our everyday world be sorted and classified by its observable properties and characteristics.</li> </ul>		
<p><b>Essential Questions:</b></p>		
<ol style="list-style-type: none"> <li>1. What is everything made of?</li> <li>2. How are liquids and solids different?</li> <li>3. How are materials used for different purposes?</li> <li>4. What happens when certain materials are heated and/or cooled?</li> <li>5. How does matter change?</li> <li>6. What are some ways that matter behaves?</li> <li>7. How do environmental conditions influence a state of matter?</li> <li>8. How do you determine which materials have the properties that are best suited for an intended purpose?</li> </ol>		
<p><b>Enduring Understandings:</b></p>		
<ul style="list-style-type: none"> <li>● Everything is made up of matter.</li> <li>● Liquids and solids have different properties.</li> <li>● Some materials are best suited for a specific purpose.</li> <li>● Some materials can change from one type of matter to another.</li> <li>● Some materials are reversible and some are not reversible.</li> <li>● Energy can change a state of matter.</li> </ul>		

**Storyline Narrative / Big Ideas:**

This unit is divided into three parts or bends that will help students understand that all matter has observable characteristics, that the structure of matter affects the properties and uses of materials. The final bend will challenge students to synthesize their knowledge and what they have learned from their experiences in the unit to engage in a culminating building task.

Bend 1- States of Matter--What properties do common objects have? How can we organize materials to help us make sense of what we observe? What are some ways that different matters behave?

Bend 2- Changes in Matter - Can matter change its state? What causes matter to change? Can matter be changed and then change again?

Bend 3 Building Challenges--collecting, testing and applying evidence using materials for an intended purpose--How can we use the engineering design process and our new understanding about matter to apply materials for an intended purpose?

**Vocabulary Words:** flexible, hardness, liquid, solid, gas, texture, temperature, weight, thermometer

Science and Engineering Practices	Disciplinary Core Ideas	Cross Cutting Concepts
<p><b><u>Developing and Using Models</u></b> Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.</p> <ul style="list-style-type: none"> <li>Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2)</li> </ul> <p><b><u>Planning and Carrying Out Investigations</u></b> Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <ul style="list-style-type: none"> <li>Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-LS2-1)</li> </ul>	<p><b>PS1.A: Structure and Properties of Matter:</b> Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties.</p> <p>Different properties are suited to different purposes.</p> <p>A great variety of objects can be built up from a small set of pieces.</p> <p><b>PS1.B: Chemical Reactions:</b> Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.</p>	<p><b>Patterns</b> - Patterns in the natural and human designed world can be observed. (2-PS1-1)</p> <p><b>Cause and Effect</b> - Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2) Events have causes that generate observable patterns. (2-PS1-4)</p> <p><b>Energy and Matter</b> - Objects may break into smaller pieces and be put together into larger pieces, or change shapes. (2-PS1-3)</p>

**Consolidated Supply List:**

- 3x5 index cards
- pipe cleaners
- craft sticks
- 6 clear plastic 8 oz bottles
- hand soap
- Oil
- corn syrup
- dish soap
- food coloring
- Cornstarch
- ice tray
- ziploc sandwich bags
- styrofoam plates
- plastic containers with lids (big enough to hold water with sandwich bag)
- toothpicks
- play doh
- straws
- construction paper
- small fan
- Book - What is the World Made Of? by Kathleen Zoehfeld
- Brainpop Jr subscription

**Episode 1**  
**Engage/Elicit Ideas**  
**Days: 1 day**

**Lessons****Lesson 1: Phenomena**

**Gather:** Students watch [phenomena](#) video

**Reason** - In a journal, students draw a model of what they saw occur in the video. Jot down their noticings and wonderings about the liquid metal being cast into a sculpture.

**Communicate** - Students share what they drew and wrote in their journals. Teacher holds a whole class discussion with students asking questions like:

- Can you explain what you drew?
- What does that represent?
- Tell me why you chose \_\_\_\_\_ to show \_\_\_\_\_?
- Can you show me what you mean by \_\_\_\_\_?
- Why did you use...?

Chart the students' findings as you discuss. Try adding question words in front of statements to encourage further investigation before drawing conclusions.

**Resources****Lesson 1:**

- Phenomena video: [Casting a Fire Ant Colony with Molten Aluminum \(Cast #043\)](#)
- Noticings and wonders - [link](#)
- Chart paper

**Episode 2**  
**Explore**  
**Days: 6 days**

**Lessons**

**Lesson 2: Mystery Solids**

**Gather** - Teacher will introduce mystery boxes to students. In each box the teacher will put an object from the list of suggested items below. Label the mystery box with a number. Instructions - [Texture Touch Boxes](#)

Suggested items you could use in your classroom:  
plastic spoons, pencil, feather, plastic beads, acorn, domino, dice, penny, seashell, candle, eraser, marble, glass bead, felt, sandpaper, paperclip, carpet square, toothpick, cotton ball, button, key, sponge, foil, wax paper, paper towel, cardboard, rubber band, styrofoam cup, wooden block, small rock, plush toy, small plastic toy, straw, stick, dowel, wood, playing card, crayon, math manipulatives, rubber duck

**Reason** - Students will explore mystery boxes. They will feel an item inside a box that they can't see, but can feel. Students will write or draw descriptions of what they feel in their journals.

**Communicate** - Teacher will lead a discussion. Go through each mystery number box - How did you describe the object? List descriptive words on class chart paper. Share the solid with the class. Explain that these are properties of solids.

**Lesson 3: Strength Matters**

**Gather** - Show students a 3x5 index card, pipe cleaner, and popsicle stick. Discuss as a class what properties these three materials have. The teacher should then explain a property we can test is strength. As a class or independently, students form a hypothesis around the three material's strengths. Which is stronger?

**Reason** - In groups students will be given an index card, 6 popsicle sticks taped together, and 6 pipe cleaners taped together. Arrange the desks so that they are about 4 inches apart to create a bridge with the materials. Students will test each material with washers to see which solid holds the most washers and is the strongest. Record on this data sheet. [How Strong Am I?](#)

**Communicate** - As a class compare the students' data in the bar graph and discuss the original hypothesis and the results.

**Resources**

**Lesson 2:**

- empty tissue boxes
- chart paper

**Lesson 3:**

- 3x5 index cards
- pipe cleaners
- craft sticks
- Washers
- Record sheet - [How Strong Am I?](#)

## Lesson 4: Mystery Liquids

**Gather** - Students will be given different mystery liquids labeled with numbers in clear bottles. These liquids are water, hand soap, oil, corn syrup, colored water, and dish soap.

**Reason** - The students will describe and classify different kinds of liquids by their observable properties while trying to figure out what the liquid is by using their eyes and moving the liquid in the bottle. Students record descriptions of each numbered bottle in a journal using bottle numbers..

**Communicate** - Teacher will lead a discussion. Go through each mystery bottle by number - How did you describe the object? The teacher will add the liquid properties to the already generated properties list from the days before. The teacher then can have the students guess the liquids and tell them what is inside.

## Lesson 5: Oobleck Experiment

**Gather** - Review class generated properties list of both solids and liquids. Discuss with students that today they will be creating a substance and using their knowledge of properties to figure out if it is a liquid or a solid.

**Reason** - Students will individually or in groups create oobleck. <https://www.steampoweredfamily.com/activities/oobleck-summer-science-fun/> They should manipulate the oobleck and then in their science journals create an annotated drawing of what they think the substance is along with its properties. The teacher can also instruct students to create a hypothesis to whether it is a solid or liquid.

**Communicate** - Have students write in their science journals their opinions whether Oobleck is a solid or a liquid using evidence of its properties.

## Lesson 6: Changing States

**Gather** - Show students an ice cube and ask them to identify its properties. Is this a solid or liquid? Discuss: what can we do to make this a liquid?

**Reason** - Students will then plan either individually or with a group what they will do to make their ice cube a liquid with only what they have access to in the classroom.

### Lesson 4:

- 6 clear plastic 8 oz bottles
- hand soap
- oil
- corn syrup
- dish soap
- food coloring
- cornstarch

### Lesson 5:

- Cornstarch
- Dish soap
- styrofoam plates
- Watch the video to review properties:  
[https://www.youtube.com/watch?v=340MmuY\\_osY](https://www.youtube.com/watch?v=340MmuY_osY)

### Lesson 6:

- ice tray
- [CauseandEffectGraphicOrganizerFreePrintable-1.pdf](#).

Draw up a plan on this cause and effect organizer - What will cause the ice to melt?

[CauseandEffectGraphicOrganizerFreePrintable-1.pdf](#).

Once the students have created their experiment the students can try melting their ice cube. If the teacher chooses to, they can put up a timer and see whose method made the ice cube melt the quickest.

**Communicate** - The class can discuss how their experiment went. The teacher may also ask:

- Why do some methods melt the ice cube quicker than others? (cause and effect)
- Can this be reversible?
- How can we get it back to a solid?
- Can all changes be reversible?
- What about paper heated up?

**Lesson 7: Building Things in Different Ways**

**Gather** - Students read the I Can Statement with you. " I can take something apart and put it back together in a different way." Lesson - **Second grade Lesson Building Things In Different Ways** Can you always take things apart and put them together in a different way?"

**Reason** - give all students a cube made out of the same amount of unifix cubes and ask students to take 5 minutes to take it apart and rebuild it in any way that you wish, but you do need to use all of the cubes.

**Communicate** - Each student places their block creations on their desks. Teacher says- "I am going to give you a couple of minutes to walk around and see if they are all the same or if you all built different things from the same cubes that you started with."

- Journal Entry - Draw a picture of your cube before and after in your journals. Answer the question - Can you take something apart and put it back together in a different way? Use your experience as evidence to explain why.

**Lesson 7:**

- Unifix cubes

**Episode 3**  
**Explain**  
**Days: 5 days**

**Lessons**

**Resources**

**Lesson 8: Vocabulary Splash**

**Gather** - display all the unit's vocabulary words on the board. Read each word to the class with a brief explanation of the words.

**Lesson 8:**

- **Vocabulary words** - flexible, hardness, liquid, solid, gas,

**Reason** - partners sort these words in an open sort using their prior knowledge. Label each group of words.

**Communicate** - share how they sorted these words to the class.

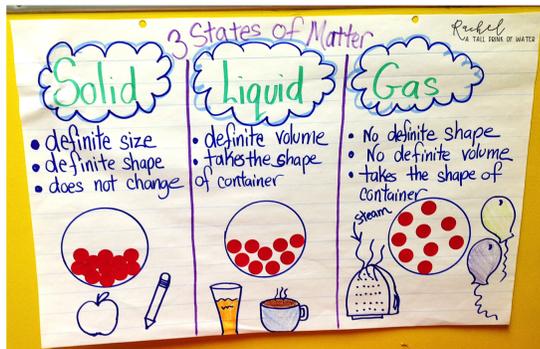
### Lesson 9: Solids, Liquids, and Gas Explained

**Vocab. Focus** - choose a few vocabulary words to focus on. Students write the word, draw a picture of the word and write the word in a sentence in their journals.

**Gather** - Have students watch the solids, liquids, and gas video on Brainpop Jr. The students can take the quiz or play the classify game.

<https://jr.brainpop.com/science/matter/solidsliquidsandgases/>

**Reason** - Create a class anchor chart with the descriptions of liquids, solids and gas as a class. See example below -



**Communicate** - Students complete the sorting activity - [MatterSolidsLiquidsGasesSortingWorksheet-1.pdf](#)

### Lesson 10: What is the World Made Of?

**Vocab. Focus** - choose a few vocabulary words to focus on. Students write the word, draw a picture of the word and write the word in a sentence in their journals.

**Gather** - Watch the read aloud: What is the World Made of? <https://www.youtube.com/watch?v=MZ-PYqNKn7I>

**Reason** - The teacher can go over the properties chart that you created as a class at the beginning of the unit. Then give students 4-5 objects around the classroom and fill out a chart describing the materials. Chart: [Describing Properties](#)

texture, temperature, weight, thermometer

- Sentence Strips of vocab words or display digitally

### Lesson 9:

- video - <https://jr.brainpop.com/science/matter/solidsliquidsandgases/>
- Sorting Activity [MatterSolidsLiquidsGasesSortingWorksheet-1.pdf](#)

### Lesson 10:

- Book - What is the World Made Of? by Kathleen Zoehfeld
- [Describing Properties](#)

**Communicate** - Class discussion with students how they can compare and contrast those objects based on their properties they identified.

- Journal Entry - Choose two objects and compare and contrast the two using the properties chart.

### Lesson 11: Heating and Cooling

**Vocab. Focus** - choose a few vocabulary words to focus on. Students write the word, draw a picture of the word and write the word in a sentence in their journals.

**Gather** - Watch these videos of lava cooling in ocean water: <https://www.youtube.com/watch?v=p8p7yxv5JYs> and <https://jr.brainpop.com/science/matter/changingstatesofmatter/> Ask: What do they think is happening in the video? Emphasize that it changed from one type of matter to another.

**Reason** - Pairs of students work together to complete the activity.

**Communicate** - Share activity answers. Teachers should ask students afterwards about what objects they have seen change states of matter (some ideas - ice cube, candy, lava, and more they can think of..) and what is needed to change states. Students choose an object that can change states - Draw on the cause and effect template to check for understanding.  
[CauseandEffectGraphicOrganizerFreePrintable-1.pdf](#).

### Lesson 11:

- Video - <https://www.youtube.com/watch?v=p8p7yxv5JYs>
- Video - <https://jr.brainpop.com/science/matter/changingstatesofmatter/>
- [CauseandEffectGraphicOrganizerFreePrintable-1.pdf](#).

## Episode 4

**Elaborate/Build New Content/Apply new Content**

**Days: 4 days**

### Activity

#### Lesson 13: Home Design Challenge

Students will work independently or as a group to build a house using materials from the classroom. Materials that could be offered to students are toothpicks, pipe cleaners, paper, craft sticks, masking tape, scotch tape, play doh, straws, paper clips, ect.

The goal is for students to design a house that can withstand high winds. The students should use their knowledge of properties from the unit to know which materials would be best.

### Resources

#### Lesson 13:

- pipe cleaners
- toothpicks
- craft sticks
- masking tape
- scotch tape
- play doh
- straws
- paper clips
- construction paper
- small fan

<p>The teacher can use a fan, hair dryer, or in class air conditioning to act as the “high winds.” When students have designed and built their house they will test it with the fan to see if it stands. If time permits the teacher can have students redesign after the first test to see if they can make their house stronger.</p>	
<p><b>Episode 5</b>  <b>Evaluate</b>  <b>Days: 1 day</b></p>	
<p><b>Assessment</b></p>	<p><b>Resources</b></p>
<p><b>Lesson 14:</b>  The assessment will be the Home Design Challenge. In a journal or on a Jamboard students should create a design of their house. They should label all the materials they used and explain why those materials were best suited for this challenge. They should also include the properties for each material and why those properties helped or didn't help their house when they tested it with the “winds.”</p>	
<p><b>Common Core Curriculum Connections</b></p>	
<p><b>ELA/Literacy –</b></p> <ul style="list-style-type: none"> <li>● RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-PS1-4)</li> <li>● RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-PS1-4)</li> <li>● RI.2.8 Describe how reasons support specific points the author makes in a text. (2-PS1-2),(2-PS1-4)</li> <li>● W.2.1 Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section. (2-PS1-4)</li> <li>● W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-1),(2-PS1- 2),(2-PS1-3)</li> <li>● W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1),(2-PS1-2),(2-PS1-3)</li> </ul> <p><b>Mathematics –</b></p> <ul style="list-style-type: none"> <li>● 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-PS1-1),(2-PS1-2)</li> </ul>	
<p><b>Instructional Strategies: Supports for English Language Learners</b></p>	

Sensory Supports	Graphic Supports	Interactive Supports
Real-life objects (realia)	Charts	In pairs or partners
Manipulatives	Graphic organizers	In triads or small groups
Pictures & photographs	Tables	In a whole group
Illustrations, diagrams, & drawings	Graphs	Using cooperative group structures
Magazines & newspapers	Timelines	With the Internet (websites) or software programs
Physical activities	Number lines	In the home language
Videos & films		With mentors
Broadcasts		
Models & figures		

## Differentiation Strategies

Accommodations	Interventions	Modifications
Allow for verbal responses	Multi-sensory techniques	Modified tasks/ expectations
Repeat/confirm directions	Increase task structure (e.g., directions, checks for understanding, feedback)	Differentiated materials
Permit response provided via computer or electronic device	Increase opportunities to engage in active academic responding (e.g., writing, reading aloud, answering questions in class)	Individualized assessment tools based on student need
Audio Books	Utilize prereading strategies and activities: previews, anticipatory guides, and semantic mapping	Modified assessment grading

Unit 2 - Earth's System and its Place in the Universe	Grade 2	Days - 19
<p><b>Standards:</b>  Students who demonstrate understanding can:</p> <p><b>2-ESS1-1. Use information from several sources to provide evidence that Earth events can occur quickly or slowly.</b> [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.] [Assessment Boundary: Assessment does not include quantitative measurements of timescales.]</p> <p><b>2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.*</b> [Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.]</p> <p><b>2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area.</b> [Assessment Boundary: Assessment does not include quantitative scaling in models.]</p> <p><b>2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid</b></p>		
<p><b>Anchoring Question:</b></p>		
<ul style="list-style-type: none"> <li>● What causes the Earth to change quickly or slowly?</li> </ul>		
<p><b>Essential Questions:</b></p>		
<ol style="list-style-type: none"> <li>1. Do all of Earth's changes take the same amount of time to happen? Why or why not?</li> <li>2. Does the Earth's surface change?</li> <li>3. What are ways that the Earth's surface changes?</li> <li>4. What are the agents of change?</li> <li>5. Do changes in the Earth's surface happen quickly or slowly?</li> <li>6. What are the effects of wind &amp; water on the land?</li> <li>7. What landforms help prevent wind and water erosion?</li> <li>8. How can the effects of wind and water erosion be controlled or reduced?</li> <li>9. How can man made materials/structures be used to impact the natural world?</li> <li>10. How do we use engineering design to solve problems involving erosion?</li> <li>11. Can humans stop Earth's surface from changing?</li> <li>12. What do landforms and oceans look like in a model?</li> </ol>		
<p><b>Enduring Understandings:</b></p>		
<ul style="list-style-type: none"> <li>● The surface of the earth is always changing.</li> <li>● Landforms result from these changes.</li> <li>● Some changes happen quickly, but most happen very slowly.</li> <li>● The impact of events that can happen very quickly.</li> <li>● Understand that events can happen very slowly over a time period much longer than anyone can observe.</li> <li>● Students will be able to identify landforms/landscapes most affected by different natural</li> </ul>		

- events (wind/storm/rain/flood)
- Wind and water can change the shape of the land.
- We can build man made structures to slow down the erosion of land.
- Landforms and oceans can be represented by shapes on a model.

**Storyline Narrative / Big Ideas:**

Students will be able to provide evidence from several sources that Earth events can occur quickly or slowly. Investigating, comparing and contrasting different landforms such as mountains, islands, caves, canyons, plateaus and processes that caused them; plate tectonics, volcanoes, water.

Students will be able to:

- Ways and processes that earth is changed
- Explain the impact of events that can happen very quickly.
- Describe events can happen very slowly over a time period much longer than anyone can observe.
- Describe events that have a beginning and an end.
- Students will be able to describe various natural events that shape the earth through erosion and weathering (sandstorm, tornado, hurricane, etc)

Apply knowledge to assess erosion/weathering risk on school grounds or other chosen site then build and test various erosion prevention models and for final project--either choose and explain/argue using gathered evidence which model that would be most useful for erosion on school grounds

- Define various landforms and identify sources of liquid/solid water on Earth.
- Students will be able to define wind and describe impact of wind erosion

**Vocabulary Words:** landform, earthquake, erosion, history, planet, surface, boulder, nature, weather, diagram, engineer, glacier, peninsula, crust, mantle

Science and Engineering Practices	Disciplinary Core Ideas	Cross Cutting Concepts
<p><b><u>Constructing Explanations and Designing Solutions</u></b> Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. ▪ Make observations from several sources to construct an evidence-based account for natural phenomena. (2-ESS1-1)</p> <p><b><u>Developing and Using Models</u></b> Modeling in K–2 builds on prior experiences and progresses to include using and developing</p>	<p><b>ESS1.C: The History of Planet Earth:</b> Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1)</p> <p><b>ESS2.A: Earth Materials and Systems:</b> Wind and water can change the shape of the land. (2- ESS2-1)</p> <p><b>ESS2.B: Plate Tectonics and Large-Scale System Interactions:</b> Maps show where</p>	<p><b>Stability and Change</b> - Things may change slowly or rapidly. (2- ESS1-1)</p> <p><b>Patterns</b> - Patterns in the natural world can be observed. (2-ESS2-2),(2-ESS2-3) Stability and Change ▪ Things may change slowly or rapidly. (2- ESS2-1)</p>

<p>models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. ▪ Develop a model to represent patterns in the natural world. (2-ESS2-2)</p> <p><b><u>Constructing Explanations and Designing Solutions</u></b> Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. ▪ Compare multiple solutions to a problem. (2-ESS2-1)</p> <p><b><u>Obtaining, Evaluating, and Communicating Information</u></b> Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. ▪ Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question. (2-ESS2-3)</p>	<p>things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2- 2)</p> <p><b>ESS2.C: The Roles of Water in Earth’s Surface Processes:</b> Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2-ESS2-3)</p> <p><b>ETS1.C: Optimizing the Design Solution:</b> Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (secondary to 2-ESS2-1)</p>	
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**Consolidated Supply List:**

- Sand,
- Straws
- ice cube tray
- Clay
- pebbles
- Cups
- Flour
- graham crackers
- frosting, spoons
- craft sticks
- paper plates

- aluminum foil
- large clear tub
- masking tape
- Mystery Science subscription
- Epic books subscription

**Episode 1**  
**Engage/Elicit Ideas**  
**Days: 2 days**

**Lessons**

**Resources**

**Lesson 1: Phenomena #1**

**Gather** - Students watch phenomena video. [Volcano forms new island - CNN Video](#)

**Reason** - In a journal, Students draw a model of what they saw occur in the video. Jot down their noticings and wonderings about the liquid metal being cast into a sculpture and the land erosion.

**Communicate** - Students share what they drew and wrote in their journals. Teacher holds a whole class discussion with students asking questions like:

- Can you explain what you drew?
- What does that represent?
- Tell me why you chose \_\_\_\_\_ to show \_\_\_\_\_?
- Can you show me what you mean by \_\_\_\_\_?
- Why did you use...?
- What causes the Earth to change quickly or slowly?

Chart the students' findings as you discuss. Try adding question words in front of statements to encourage further investigation before drawing conclusions.

**Lesson 2: Phenomena #2**

**Gather** - Students watch phenomena video. [Drew Point, AK Time-Lapse Photography of Coastal Erosion](#)

**Reason** - In a journal. Students draw a model of what they saw occur in each video. Jot down their noticings and wonderings about the land erosion.

**Communicate** - Students share what they drew and wrote in their journals. Teacher holds a whole class discussion with students asking questions like:

- Can you explain what you drew?
- What does that represent?
- Tell me why you chose \_\_\_\_\_ to show \_\_\_\_\_?

**Lesson 1:**

- Phenomena videos: [Volcano forms new island - CNN Video](#)

**Lesson 2:**

- [Drew Point, AK Time-Lapse Photography of Coastal Erosion](#)

- Can you show me what you mean by \_\_\_\_?
- Why did you use...?
- What causes the Earth to change quickly or slowly?

Chart the students' findings as you discuss. Try adding question words in front of statements to encourage further investigation before drawing conclusions.

**Episode 2**  
**Explore**  
**Days: 4 days**

**Lessons**

**Resources**

**Lesson 3: Landforms Change**

**Gather** - Ask students - What is a landform? Can you name a few? Explain that students will be looking at different landforms around the room on chart paper. They will look at before and after pictures of a fast or slow moving change.

**Reason** - The students walk around visiting these landforms on chart paper and will write what they notice and wonder about the pictures on chart paper. Students should be discussing with groups what they are writing.

**Communicate** - The students will come back together and they will review as a group what they noticed on each poster. Then students will choose one pair of pictures to look at more closely. In their notebooks they will draw a model showing their thinking (cause and effect) of how they think the landform got from the first image to the second image Teacher shares models that use pictures, labels and words to discuss science model expectations.

**Lesson 4 - How Can Wind Change the Shape of Land?**

**\*\*Please preview science activity prep to understand how to prepare and facilitate this lesson\*\*** [How Can Wind Change the Shape of the Land?](#)

**Gather** - Show students a few pictures([photos to show wind erosion.pdf](#) ) of how wind has changed the land and created some really interesting formations.

**Reason** - Students make a sand tower for the class. Measure its height in cm. Record the measurement. Then I have about 1/3 of the children come up, one at a time, and [blow into their straw](#) about 5-8 times to create "wind"

**Lesson 3:**

- [Landforms Change](#)

**Lesson 4:**

- sand (enough to fill a Cool-Whip container)
- straws--1 per child
- plastic container/bin--1 per clas
- [erosion observation recording sheet](#)--1 per student
- Lesson site - [How Can Wind Change the Shape of the Land?](#)
- Photos - [photos to show wind erosion.pdf](#)
- Observation sheet - [erosion](#)

blowing on the hill. Measure the height after puff of wind and record in cm. What did you notice? Were there any changes? Why do you think those changes took place? Use recording sheet [erosion observation recording sheet.pdf](#), repeat three times.

**Communicate** - I would like you to explain wind erosion to your [turn and talk partner](#). Explain how it can help shape the land.

### Lesson 5: Glaciers: A Slow Change

**Gather** - Watch this video clip from the movie Ice Age <https://www.youtube.com/watch?v=L02XRHbqSE4> You can explain to students that the Ice Age was around 12 thousand years ago and we will look at how glaciers move and change the land.

**Reason** - Students will then make a model with clay, ice with sand and pebbles to show how glaciers change land. Students should roll clay out to be about an inch thick rectangle shape (picture attached). Then the teacher will give each group an ice cube that has a layer of sand and small pebbles on the bottom. The students will place the ice cube on one end of the clay and then push down and drag the ice cube through the land about halfway and then let it melt. Students should observe and record their noticings in their notebooks.



**Communicate** - As a class the teacher can ask the students questions like:

- What did you notice?
- Can you see anything left behind?
- What happens to the surface of the land?

If time lets you watch this video which shows the inside of a glacier.

[https://www.youtube.com/watch?v=Gbfu2-Z\\_iDI&t=1s](https://www.youtube.com/watch?v=Gbfu2-Z_iDI&t=1s)

You can also go over this page

<http://www.onegeology.org/extra/kids/earthprocesses/glacialMovement.html> to explain how glaciers are slow moving changes to the land.

### Lesson 6: Volcanoes: A Fast Change

**\*\*Please preview mystery science activity prep to**

[observation recording sheet.pdf](#)

### Lesson 5:

- clay
- ice cube with a layer of sand and pebbles
- video - <https://www.youtube.com/watch?v=L02XRHbqSE4>

### Lesson 6:

- Water
- Flour

understand how to prepare for this lesson\*\*

**Gather** - Students will watch the introduction of a mystery science video about volcano eruptions (fast land change) [Why do some volcanoes explode?](#)

**Reason** - Students will do the activity in the mystery science video. They will compare two types of lava (thick and thin) Thin is water and thick is water and flour mixed together. Students will blow bubbles in both lavas and observe what happens. Students will try to make a mountain with both lavas and observe what happens. Students will work to figure out why only some volcanoes explode.

**Communicate** - As a class, lead a discussion based on the observations. Discuss why some volcanoes explode and when a volcano explodes how it is a fast change to the Earth's surface.

### **Lesson 5: Fast Changes**

**Gather** - Ask students - How can we design a solution to prevent a fast change to the Earth's surface?

**Reason** - Give students an opportunity to look deeper into one of these fast changes: earthquakes. Have students in groups construct a structure out of toothpicks and marshmallows. Explain to students they should try to make it strong enough to avoid falling over. The teacher can have prepared a tin pan with jello. Students can take turns putting their house on top and shaking the pan to see if their house is strong enough.

**Communicate** - Draw structure in your notebook and reflect on what you would change or not change to make it stable from an earthquake.

- Cups
- Lesson site - [Why do some volcanoes explode?](#)

### **Episode 3**

**Explain**

**Days: 6 days**

### **Lessons**

### **Resources**

### **Lesson 7: Vocabulary Splash**

**Gather** - display all the unit's vocabulary words on the board. Read each word to the class with a brief explanation of the words.

**Reason** - partners sort these words in an open sort using their prior knowledge. Label each group of words.

### **Lesson 7:**

- **Vocabulary words** - landform, earthquake, erosion, history, planet, surface, boulder, nature, weather, diagram,

**Communicate** - share how they sorted these words to the class.

### Lesson 8: What are landforms?

**Vocab. Focus** - choose a few vocabulary words to focus on. Students write the word, draw a picture of the word and write the word in a sentence in their journals.

**Gather** - Watch this brainpop video about landforms.  
<https://jr.brainpop.com/science/land/landforms/>

**Reason** - Students will explore the landforms by creating their own out of play-doh or clay. You can have this activity in stations either digitally or printed out. Students will look at pictures/videos/articles about the landform. Then as a group they will work together to create a model of that landform using the clay or play-doh. They will do this at each station. The teacher should focus on mountains, plateaus, valleys, canyons, plains, deserts, volcanoes, coasts, ect.. \*\*Bodies of water will be focused on in the next unit.

**Communicate** - The class will come together and discuss the different landforms they looked at. The teacher can explain that we will be exploring how these landforms are formed and also how they change. Independently complete [Describing the Earth's Surface Worksheets](#)

### Lesson 9: Earthquakes

**Vocab. Focus** - choose a few vocabulary words to focus on. Students write the word, draw a picture of the word and write the word in a sentence in their journals.

**Gather** - Read Aloud - Earthquakes by Minden on Epic Books - <https://www.getepic.com/app/read/11969>  
During Reading - Ask Questions - 5Ws to understand key details

**Reason** - The students will use graham crackers and frosting to model the crust and mantle. The graham crackers are the crust and the frosting is the mantle. The teacher will ask the students to move the graham crackers in different ways to show how the movement

engineer, glacier,  
peninsula, crust,  
mantle

- Sentence Strips of vocab words or display digitally

### Lesson 8:

- Video - <https://jr.brainpop.com/science/land/landforms/>
- Worksheet -
- [Describing the Earth's Surface Worksheets](#)

### Lesson 9:

- Epic Book - Earthquakes by Minden  
<https://www.getepic.com/app/read/11969>
- Graham Cracker activity:  
<https://www.youtube.com/watch?v=2-6xhGT-HQo>
- Graham Crackers
- Frosting
- Cups
- Spoons
- Paper Plates
- Water
- Flour

causes different landforms on the Earth's surface. The students will use 2 graham crackers because the teacher should explain the Earth is made up of plates.

1. Students will pull the graham crackers apart. This is called divergent faults. When this happens we can get rift valleys and also new landforms (volcanic islands) that usually occur with oceanic plates.
2. Get two graham crackers and dip them in water and then push them together. This is called convergent fault. This is how some mountain ranges are formed.
3. Then have the students move the graham crackers past each other. This is called transverse/ transform faults. This can break the surface of the Earth up. The energy of this happening is what is felt during an earthquake.

**Communicate** - Students draw a model of an earthquake using pictures, labels and words on Jamboard. View the models to discuss what a scientific model should look like.

## Lesson 10: Classifying Fast and Slow Changes

**Vocab. Focus** - choose a few vocabulary words to focus on. Students write the word, draw a picture of the word and write the word in a sentence in their journals.

**Gather** - Explain to students that today they will be doing their own research/exploration into fast and slow changes to the Earth's surface. Remind students that as they have observed the Earth's crust goes through many changes that can either take a long time or happen quickly. Today they will be doing their own research to find out which events cause a fast change or a slow change to the Earth.

**Reason** - Give students resources like articles, videos, or books about volcanoes, tsunamis, glaciers, landslides, and weathering. Have students work in stations to research. With their group they should determine if it is a fast change or a slow change. They should record their findings and their evidence in their science notebooks. (some resources for this are attached in the episode supply list) template - [InformativeWritingGraphicOrganizer](#)

**Communicate** - As a class, students share their findings. Students will complete the worksheet with the change as slow or quick - [Quick or slow change worksheet](#)

- Clay
- Sand
- Worksheet - [Quick or slow change worksheet](#)

## Lesson 10: Articles

- <https://www.nationalgeographic.org/encyclopedia/weathering/>
- <https://www.sciencekids.co.nz/sciencefacts/earth/tsunamis.html>
- <https://www.sciencekids.co.nz/sciencefacts/weather/floods.html>
- <https://www.sciencekids.co.nz/sciencefacts/earth/earthquakes.html>
- <https://www.youtube.com/watch?v=a8ybdnKtcl8>
- <https://www.youtube.com/watch?v=RCxvbosa4fU>
- <https://www.youtube.com/watch?v=hWqVWKHbmts>
- <https://www.youtube.com/watch?v=ddzU-rkzKF0>

<p><b>Lesson 11: Where can we find water on Earth?</b></p> <p><b>Vocab. Focus</b> - choose a few vocabulary words to focus on. Students write the word, draw a picture of the word and write the word in a sentence in their journals.</p> <p><b>Gather</b> - Watch video on bodies of water <a href="#">The Water Bodies   The Dr. Binocs Show</a></p> <p><b>Reason</b> - Bodies of Water worksheet <a href="#">Bodies of Water Worksheets</a></p> <p><b>Communicate</b> - Play class game - Trashketball on Landforms and Bodies of Water - <a href="https://www.teacherspayteachers.com/Product/Landforms-and-Bodies-of-Water-5091306?st=edfe24273c6c4bb4299b5b5306de35f5">https://www.teacherspayteachers.com/Product/Landforms-and-Bodies-of-Water-5091306?st=edfe24273c6c4bb4299b5b5306de35f5</a></p>	<p><b>Lesson 11:</b></p> <ul style="list-style-type: none"> <li>• Video - <a href="#">The Water Bodies   The Dr. Binocs Show</a></li> <li>• Worksheet - <a href="#">Bodies of Water Worksheets</a></li> <li>• Game - <a href="https://www.teacherspayteachers.com/Product/Landforms-and-Bodies-of-Water-5091306?st=edfe24273c6c4bb4299b5b5306de35f5">https://www.teacherspayteachers.com/Product/Landforms-and-Bodies-of-Water-5091306?st=edfe24273c6c4bb4299b5b5306de35f5</a></li> </ul>
<p><b>Episode 4</b>  <b>Elaborate/Build New Content/Apply new Content</b>  <b>Days: 5 days</b></p>	
<p><b>Activity</b></p>	<p><b>Resources</b></p>
<p><b>How to Prevent a Landslide:</b>  Students will be tasked with designing a solution to prevent or slow down a landslide. The teacher will set up a model of a landslide by using a clear tub and using crumpled newspaper, sand, and dirt to fill up the tub to create a hill that goes to a flat surface. The teacher should also put something at the bottom of the hill to represent a house. The students will plan different solutions to prevent the landslide from damaging the “house.”</p> <p>Students could create boundary walls, tubes to redirect the water, objects to represent vegetation, or more. Once students have designed a working model they will place it on the landslide model. The teacher will then use a cup of water or watering can to represent a rain storm. The students will then see if their model is successful. They should evaluate their design and then work to improve it.</p>	<ul style="list-style-type: none"> <li>• Large clear tub</li> <li>• Newspaper</li> <li>• Sand and dirt</li> <li>• Cardboard</li> <li>• Craft sticks</li> <li>• Paper plates</li> <li>• Straws</li> <li>• Cups</li> <li>• Aluminum foil</li> <li>• Tape</li> </ul>
<p><b>Episode 5</b>  <b>Evaluate</b>  <b>Days: 2 days</b></p>	
<p><b>Assessment</b></p>	<p><b>Resources</b></p>
<p>Reflection Writing Piece - In a journal or on a Jamboard</p>	<p>Use a rubric or checklist from</p>

students should create a diagram of their design. They should label all the materials they used and answer the question - Why is this design able to prevent a landslide? They should also explain if a landslide is a fast or slow Earth change and why their solution will help this change.

one of your writing units

### Common Core Curriculum Connections

#### ELA/Literacy

- RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-ESS1-1)
- RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1)
- W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS1-1)
- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-ESS1-1)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1)
- SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1)
- RI.2.9 Compare and contrast the most important points presented by two texts on the same topic. (2-ESS2-1)
- SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-ESS2-2)

#### Mathematics

- 2.NBT.A Understand place value. (2-ESS1-1)
- 2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)
- 2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. (2-ESS2-1)

### Instructional Strategies: Supports for English Language Learners

Sensory Supports	Graphic Supports	Interactive Supports
Real-life objects (realia)	Charts	In pairs or partners
Manipulatives	Graphic organizers	In triads or small groups
Pictures & photographs	Tables	In a whole group
Illustrations, diagrams, & drawings	Graphs	Using cooperative group structures
Magazines & newspapers	Timelines	With the Internet (websites) or software programs
Physical activities	Number lines	In the home language
Videos & films		With mentors
Broadcasts		
Models & figures		

### Differentiation Strategies

Accommodations	Interventions	Modifications
Allow for verbal responses	Multi-sensory techniques	Modified tasks/ expectations
Repeat/confirm directions	Increase task structure (e.g., directions, checks for understanding, feedback)	Differentiated materials
Permit response provided via computer or electronic device	Increase opportunities to engage in active academic responding (e.g., writing, reading aloud, answering questions in class)	Individualized assessment tools based on student need
Audio Books	Utilize prereading strategies and activities: previews, anticipatory guides, and semantic mapping	Modified assessment grading

Unit 3 - Ecosystems: Plants	Grade 2	Days - 20
<p><b>Standards:</b>  Students who demonstrate understanding can:  <b>2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow.</b> [Assessment Boundary: Assessment is limited to testing one variable at a time.]   <b>2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*</b></p>		
<p><b>Question:</b></p>		
<ul style="list-style-type: none"> <li>• What do plants need to grow and thrive in their habitats?</li> </ul>		
<p><b>Essential Questions:</b></p>		
<ol style="list-style-type: none"> <li>1. How do plants grow, thrive and survive?</li> <li>2. How are living things dependent upon one another?</li> <li>3. How are seeds dispersed?</li> </ol>		
<p><b>Enduring Understandings:</b></p>		
<ul style="list-style-type: none"> <li>• Ecosystems are made up of climate, plants, soil and animals. Within each ecosystem there is a relationship between living things and non-living things. Energy can change from one form to another, starting with the sun.</li> <li>• Organisms have basic needs (animals need air, water and food; plants need air, water, light and nutrients) though the amount of these needs may vary.</li> <li>• When the environment changes plants and animals adapt, move or die. Each plant and animal adapts in their own way to their environment.</li> <li>• Plants have specific adaptations to disperse their seeds.</li> </ul>		
<p><b>Storyline Narrative / Big Ideas:</b>  In this unit of study, students develop an understanding that plants depend on their surroundings to get what they need to survive and live in their habitats. The students will elaborate on seed dispersal by observing how other living things help with the dispersal of seeds. Students will investigate and develop models to show how seeds are dispersed.. Students will then be assessed by building a model of a seed disperser.</p>		
<p><b>Vocabulary Words:</b> survive, behavior, mimic. pollinate, predatory, survival, migrate, ecosystem, roots</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Cross Cutting Concepts
<p><b>Developing and Using Models</b>  Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing,</p>	<p><b>LS2.A: Interdependent Relationships in Ecosystems:</b>  Plants depend on water and light to grow.  (2-LS2-1)</p>	<p><b>Cause and Effect</b> - Events have causes that generate observable patterns.  (2-LS2-1)   <b>Structure and Function</b> - The shape and stability of structures of natural and</p>

<p>physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.</p> <ul style="list-style-type: none"> <li>▪ Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2)</li> </ul> <p><b><u>Planning and Carrying Out Investigations</u></b></p> <p>Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <p>Plan and conduct an investigation collaboratively to produce data to serve as the e basis for evidence to answer a question. (2-LS2-1)</p>	<p>Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)</p> <p><b>ETS1.B: Developing Possible Solutions:</b></p> <p>Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people. (secondary to 2-LS2-2)</p>	<p>designed objects are related to their function(s). (2-LS2-2)</p>
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**Consolidated Supply List:**

- 6 plants of the same size and shape
- 1 gallon rainwater
- 3 gallons tap water, divided
- 1 gallon bottled spring water
- 1 gallon distilled water
- 1 cup sugar
- 1 cup salt
- Watering can
- Sticky labels
- Ruler
- Notebook
- Pencil
- Marker
- Lettuce leaves
- Paper towels
- Food coloring
- Water Container
- Black construction paper
- Medium binder clips
- Paper clips

- 2 radishes with leaves and obvious root hairs
- paper plate
- cutting board
- dissection knives
- magnifier
- centimeter ruler
- Book - What If There Were No Bees by Slade
- Mystery Science subscription
- Book - Cactus Hotel by Brenda Gulberson

**Episode 1**  
**Engage/Elicit Ideas**  
**Days: 1 day**

**Lessons**

**Resources**

**Lesson 1: Elicit Ideas about Plant Growth**

**Gather** - Students watch phenomena video [link](#)

**Reason** - In a journal, students draw a model of what they saw occur in the video. Jot down their noticings and wonderings about the corn growing in water.

**Communicate** - Students share what they drew and wrote in their journals. Teacher uses a class KWL to chart their findings about what they know about plant growth.

**Lesson 1:**

- Phenomena Video - [link](#)

**Episode 2**  
**Explore**  
**Days: 6 days**

**Lessons**

**Resources**

**Lesson 2: Investigate whether plants need sunlight and water to grow**

**Gather** - Students watch the Sunlight and Water Experiment Video [link](#)

**Reason** - Students draw a model of what they saw occur in the videos focusing on the causes and effects of the different variables.

**Communicate** - Students use a cause and effect chart to jot down effects of water/no water and sunlight/no sunlight on the growth of plants.

**Lesson 3: Discovering the Best Water for Plants**

**Gather** - Read Aloud - The Tiny Seed - [The Tiny Seed by](#)

**Lesson 2:**

- Sunlight and Water Experiment video - [link](#)
- Cause and Effect Chart - [link](#)
- Recording Sheet - [link](#)

**Lesson 3:**

- experiment - [best-water-for-plants.pdf](#)
- Book - The Tiny Seed by Eric

[Eric Carle](#). Ask questions before, during and after your read aloud:

What did this seed need to grow?

How did the seed move?

**Reason** - Discuss with the class what a plant needs to grow based on the book read above. Then ask students what is the best water for seeds/plants to grow. Science groups will explore the best water for seeds/plants (rainwater, tap water, spring water, distilled water, sugar water, salt water) and record data and observations over a week time period. Using 6 plants of the same size and shape, water with each of the six types of water. Measure each plant and create a bar graph to keep record of their growth. [Generic Bar Graph Template](#) Use this link to conduct the experiment - [best-water-for-plants.pdf](#)

- At the same time every day, students will give each plant the type of water that's listed on its sticky label. Give each plant the same amount of water each day (such as 1/2 cup) to make sure that all plants are treated the same. Water each plant daily for one week.

**Communicate** - Have students create a table in their notebooks with the 6 different types of water. For each type of water, students predict in their science notebooks what will happen to the plants after one week.

#### **Lesson 4: How Water Flows in Plants** (2 days)

\*\*\*\*\*Before this new lesson students give each plant the 6 different water types each day and record any changes in the plants. Measure the heights of the plants and record them on the bar graph.

**Gather** - Ask students - How do you think these plants are drinking these 6 types of water? Discuss their knowledge and add to the KWL chart. Tell students that today we will find out the flow of water through a plant.

**Reason** - Student partnerships will put pieces of Romaine lettuce leaves in red or blue-colored water. (Butter lettuce works well too.) Let this sit overnight. The next day students will draw a model of the veins of the lettuce. Students should use arrows to show the flow of water/food coloring through the plant. Students write

Carle - [link](#).

- 6 plants of the same size and shape
- 1 gallon rainwater
- 3 gallons tap water, divided
- 1 gallon bottled spring water
- 1 gallon distilled water
- 1 cup sugar
- 1 cup salt
- Watering can
- Sticky labels
- Ruler
- Notebook
- Pencil
- Marker
- Bar graph - [Generic Bar Graph Template](#)

#### **Lesson 4:**

- Romaine Lettuce leaves
- Paper towels
- Food coloring
- cups

down their observations.

**Communicate** - Share their understanding of the flow of water through the plants with the class. Add new learning to the class KWL chart.

### **Lesson 5: How did a Tree Travel Halfway Around the World?**

\*\*\*\*\*Before this new lesson students give each plant the same amount of water types each day and record any changes in the plants. Measure the heights of the plants and record them on the bar graph.

**Gather** - Using Mystery Science - [How did a tree travel halfway around the world?](#)

Plant Adventures Lesson 1 - Tell students that in this lesson, you will learn how seeds must get away from their parent plant in order to survive.

**Reason** - In the activity, Fly Your Own Seed, students will create a model seed from paper. Then, they release these seeds to model how they disperse and observe if any seeds are able to escape the parent plant's "Zone of Darkness" and survive.

**Communicate** - Students reflect on their new learning from this experiment on seed dispersal. Draw a model of the best way to disperse a seed to grow successfully.

#### **Lesson 5:**

- black construction paper
- medium binder clips
- Paper clips
- Lesson - [How did a tree travel halfway around the world?](#)

**Episode 3**  
**Explain**  
**Days: 9 days**

#### **Lessons**

### **Lesson 6: Vocabulary Splash**

\*\*\*\*\*Before this new lesson students give each plant the same amount of water types each day and record any changes in the plants. Measure the heights of the plants and record them on the bar graph.

**Gather** - Display all the unit's vocabulary words on the board. Read each word to the class with a brief explanation of the words.

#### **Resources**

#### **Lesson 6:**

- Vocabulary Words - survive, behavior, mimic, pollinate, predatory, survival, migrate, ecosystem, roots

**Reason** - partners sort these words in an open sort using their prior knowledge. Label each group of words.

**Communicate** - share how they sorted these words to the class.

### **Lesson 7: Pollination Power! (2 days)**

\*\*\*\*\*Before this new lesson students give each plant the same amount of water types each day and record any changes in the plants. Measure the heights of the plants and record them on the bar graph.

**Vocab. Focus** - choose a few vocabulary words to focus on. Students write the word, draw a picture of the word and write the word in a sentence in their journals.

**Gather** - Watch Video on Pollination - [Flowers and Their Pollinators](#)

**Reason** - Students are placed in expert groups to research a power pollinator. (bat, hummingbird. Bees, butterflies, flies, moths, ladybugs) You have to research how your assigned pollinator helps pollinate flowers. Students use the expert graphic organizer on the Pollination Power Lesson website.

Students use this website and other books from the school library to research about their pollinator.

[Pollinators – Kids Growing Strong](#)

Use their expert graphic organizer to record information they learned from their research. [Pollination Expert.pdf](#)

**Communicate** - Experts share their research with the class.

### **Lesson 8: Discovering the Best Water for Plants Follow Up**

**Gather** - Measure the final heights of the plants and record them on the bar graph.

**Reason** - Students finish their bar graphs for the last day of feeding these plants different types of water. Students analyze the data. Students write down what they noticed. Students should use numbers to explain the data.

**Communicate** - Students write their final reflections about the different types of water. In their science journals they write their opinions based on evidence from the graph data.

### **Lesson 7:**

- Video - [Flowers and Their Pollinators](#)
- Research website - [Pollinators – Kids Growing Strong](#)
- Graphic organizer - [Pollination Expert.pdf](#)
- Pollination Power Lesson Details and Resources - [link](#)
- School Library books on bats, bees, butterflies, flies. Moths, ladybugs

### **Lesson 8:**

- 6 plants
- Graph from previous lessons

## Lesson 9: Why Do We Need Bees?

**Vocab. Focus** - choose a few vocabulary words to focus on. Students write the word, draw a picture of the word and write the word in a sentence in their journals.

**Gather** - Read aloud [What If There Were No Bees?](#) by Slade - [What If There Were No Bees? Read Aloud](#) Or [What If There Were No Bees?](#)

Discuss what a food chain is using this website [Food Chain - Kid's Corner](#)

**Reason** - Students use the journal page Why Do We Need Bees paper to write down why we need bees. Share ideas, [Why Do We Need Bees](#)

**Communicate** - Students create a food chain that involves bees using the Pollination Bee Chain paper on the lesson website. [Pollination Bee Chain paper](#)

## Lesson 10: Investigation of Roots: Dissecting Roots

\*\*\*\*\*Before this new lesson students give each plant the same amount of water types each day and record any changes in the plants. Measure the heights of the plants and record them on the bar graph.

**Vocab. Focus** - choose a few vocabulary words to focus on. Students write the word, draw a picture of the word and write the word in a sentence in their journals.

**Gather** - Watch Video - [Structure and Function of Roots](#)  
Teacher will Dissect/cut open a radish - the students will use all of their senses to examine both the outside and inside of the radish root

**Reason** - Together draw a diagram of the radish with labels to identify its structure. Encourage them to make detailed measurements and drawings and record their observations.

**Communicate** - What is the importance of the roots to a

## Lesson 9:

- Book - What If There Were No Bees by Slade [What If There Were No Bees? Read Aloud](#) or [What If There Were No Bees?](#)
- Food Chain website - [Food Chain - Kid's Corner](#)
- Why Do We Need Bees journal page - [Why Do We Need Bees](#)
- Food Chain Paper - [Pollination Bee Chain paper](#)
- Lesson Details - Why Do We Need Bees Lesson and Resources - [link](#)

## Lesson 10:

- 2 radishes with leaves and obvious root hairs
- paper plate
- cutting board
- dissection knife
- magnifiers
- centimeter ruler

<p>plant? Write their reflections in their science journals.</p> <p><b>Lesson 11: Living Things in Ecosystem</b>  <b>Vocab. Focus</b> - choose a few vocabulary words to focus on. Students write the word, draw a picture of the word and write the word in a sentence in their journals.</p> <p><b>Gather</b> - What is an ecosystem? Discuss how all living and nonliving things work together. Listen to Read Aloud Cactus Hotel by Brenda Gulberson- <a href="#">Cactus Hotel Storytime</a></p> <p><b>Reason</b> - Students identify how the cactus provides an ecosystem for living and nonliving things to survive. Use a graphic organizer web (pg 16) <a href="#">link</a> to show how the cactus is connected to so many living and non living things.</p> <p><b>Communicate</b> - Students reflect by answering this question. What would happen if the cactus became extinct? (cause and effect)</p>	<p><b>Lesson 11:</b></p> <ul style="list-style-type: none"> <li>• <b>Book</b> - Cactus Hotel by Brenda Gulberson- <a href="#">Cactus Hotel Storytime</a></li> <li>• Graphic Organizer Web - pg 16 - <a href="#">link</a></li> </ul>
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**Episode 4**  
**Elaborate/Build New Content/Apply new Content**  
**Days: 3 days**

Activity	Resources
<p><b>Activity to show Knowledge Transfer -</b>            Design a model that will transfer pollen from one flower to another. Students plan out this investigation and create a supply list of materials they need. Gather materials from in the classroom. Students record results of their experiment. Make adjustments as needed to improve their pollen transfer design.</p>	<ul style="list-style-type: none"> <li>• Classroom Materials</li> <li>• Materials donated from home if necessary</li> </ul>

**Episode 5 -**  
**Evaluate**  
**Days: 1 day**

Assessment	Resources
<p>Print both pages and administer the assessment:</p> <p>Plant Needs - <a href="#">What Do Plants Need to Grow</a> and            Pollination - <a href="#">Bees and pollination</a></p>	

## Common Core Curriculum Connections:

### ELA/Literacy –

- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-LS2-1)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-LS2-1) SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-LS2-2)

### Mathematics –

- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems. (2-LS2-2)

## Instructional Strategies: Supports for English Language Learners

Sensory Supports	Graphic Supports	Interactive Supports
Real-life objects (realia)	Charts	In pairs or partners
Manipulatives	Graphic organizers	In triads or small groups
Pictures & photographs	Tables	In a whole group
Illustrations, diagrams, & drawings	Graphs	Using cooperative group structures
Magazines & newspapers	Timelines	With the Internet (websites) or software programs
Physical activities	Number lines	In the home language
Videos & films		With mentors
Broadcasts		
Models & figures		

## Differentiation Strategies

Accommodations	Interventions	Modifications
Allow for verbal responses	Multi-sensory techniques	Modified tasks/ expectations
Repeat/confirm directions	Increase task structure (e.g., directions, checks for understanding, feedback)	Differentiated materials
Permit response provided via computer or electronic device	Increase opportunities to engage in active academic responding (e.g., writing, reading aloud, answering questions in class)	Individualized assessment tools based on student need
Audio Books	Utilize prereading strategies and activities: previews, anticipatory guides, and semantic mapping	Modified assessment grading

Unit 4 - Biological Evolution	Grade 2	Days - 17
<p><b>Standards:</b>            Students who demonstrate understanding can:  <b>2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.</b> [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]</p>		
<p><b>Question</b></p>		
<ul style="list-style-type: none"> <li>• Can plants and animals of many diversities live in different habitats?</li> </ul>		
<p><b>Essential Questions:</b></p>		
<ol style="list-style-type: none"> <li>1. What plants and animals live on land.</li> <li>2. What plants and animals live in water?</li> <li>3. What do plants and animals need to live on land?</li> <li>4. What do plants and animals need to live in water?</li> <li>5. Do plants and animals depend on each other to live on land and in water?</li> </ol>		
<p><b>Enduring Understandings</b></p>		
<ul style="list-style-type: none"> <li>• Various kinds of plants and animals live on land and water.</li> <li>• Plants and animals need food, shelter and space in their habitats.</li> <li>• Plants and animals use resources from each other to survive in their habitats.</li> </ul>		
<p><b>Storyline Narrative / Big Ideas:</b>            Students will plan and carry out investigations on different external <u>structures</u> of animals to determine what habitats they would live and survive in and argue from the evidence why animals need to have specific <u>structures to function</u> in a habitat.. Students will then evaluate all of the information they have collected in the storyline to develop models of a new animal/plant that's <u>structures</u> would survive in a particular habitat. Students communicate about their model to the class and describe why they chose the <u>structures</u> for their particular habitat.</p>		
<p><b>Vocabulary Words:</b> behavior, mimic, pollination, predatory, survival, ecosystem, species, habitat, characteristic, extinct</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Cross Cutting Concepts
<p><b><u>Planning and Carrying Out Investigations</u></b>            Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to</p>	<p><b>LS4.D: Biodiversity and Humans:</b>            There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)</p>	

support explanations or design solutions. Make observations (firsthand or from media) to collect data that can be used to make comparisons. (2-LS4-1)		
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**Consolidated Supply List:**

- styrofoam peanuts
- clay, shaped like a fish,
- Pipe cleaner,
- Sunflower seeds
- Rice grains
- Cotton balls
- Grass clippings or paper shredded
- maraschino cherries
- One pair of chopsticks
- One small and one large clothespin
- One slotted spoon or pasta server
- One pair of tweezers
- One set of tongs
- Thin straws or coffee stirrers (1 per student)
- One pair of pliers
- Bowls
- Book - Cactus Hotel by Brenda Guiberson
- Brainpop Jr. subscription

**Episode 1**  
**Engage/Elicit Ideas**  
**Days: 1 day**

**Lessons**

**Lesson 1: Phenomena**

**Gather** - Can plants and animals of many diversities live in different habitats? google slide to Show Pictures of a parking lot, pond, meadow - [Habitat Link](#)

**Reason** - Print pictures and have students jot down what animals and plants live in these habitats and any other observations they can make on this [Recording Sheet](#)

**Communicate** - Share findings, Students choose one of the habitats and draw a model of that habitat with the animals and plants that they think live there. Label the pictures with the important things that help these animals and plants survive. (Keep this model available to refer

**Resources**

**Lesson 1:**

- Pictures - [Habitat Link](#)
- [Recording Sheet](#)

back to add to the model or edit the model)	
<b>Episode 2</b> <b>Explore</b> <b>Days: 5 days</b>	
<b>Lessons</b>	<b>Resources</b>
<p><b>Lesson 2: Animal Characteristics</b>  <b>Gather</b> - What does it mean to sort? Let's look at these animals. Model sorting and thinking aloud why you put them together.</p> <p><b>Reason</b> - Students in groups/pairs will sort the rest of the animals into groups with similar characteristics <a href="#">photos</a>, Students should label with categories,</p> <p><b>Communicate</b> - Students share with the class ways the animals were sorted and why. List the different categories that were used to sort. Ask - Do these characteristics/ categories help an animal survive. In journal - Have students write down one characteristic/category and why this would help an animal survive in their environment/habitat.</p> <p><b>Lesson 3: Plant and Animal Dependency</b>  <b>Gather</b> - Go on a Rainforest Virtual Field Trip - <a href="#">link</a>, Check out all of the animals that live in one habitat/environment.</p> <p><b>Reason</b> - Students record the animals and plants mentioned in the video on the note taking sheet attached <a href="#">Rain Forest Note Taking Chart</a></p> <p><b>Communicate</b> - In their science journals name two animals or plants that need each other to live in the rainforest. How do they help with their survival?</p> <p><b>Lesson 4: Life in Habitats</b>  <b>Gather</b> - Show data from a scientist and discuss some noticings and wonderings they made about the animals in these different habitats - <a href="#">data</a> - Example questions or wonderings. I see amphibians don't live in oceans. Why do they not live in oceans?</p> <p><b>Reason</b> - Students graph each habitat. Do it together and the rest with a partner. <a href="#">Graph</a>. Students write some statements about the graphs they created.</p>	<p><b>Lesson 2:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Photos</a></li> </ul> <p><b>Lesson 3:</b></p> <ul style="list-style-type: none"> <li>• Virtual Field Trip - <a href="#">link</a></li> <li>• Note Taking Sheet - <a href="#">Rain Forest Note Taking Chart</a></li> </ul> <p><b>Lesson 4:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Data</a></li> <li>• <a href="#">Graph</a></li> </ul>

**Communicate** - Share statements/noticings. Refer back to the question - Can plants and animals of many diversities live in different habitats? Go back to their model of their habitat in the first episode and see if they want to add or revise their pictures.

**Lesson 5: Animal Structures** - bird beaks (lesson - use this link for details [link](#) and prepping.

**Gather** - Show pelican beak and tongs - [pelican and tongs](#). Ask the question - how is the pelican beak and tongs alike?

**Reason** - Students visit stations to see what beaks are best for picking up different items. Use the bird beak worksheet in the lesson link above or here - [BirdsandBeaksWorksheet.pdf](#)

- Station 1: Several styrofoam peanuts floating in a bowl of water and one lump of clay, shaped like a fish, to sink to the bottom.
- Station 2: Pipe cleaner, cut into 1" pieces, buried in a bowl of sand or soil.
- Station 3: Sunflower seeds in a bowl.
- Station 4: Rice grains pressed into a piece of clay.
- Station 5: Cotton balls
- Station 6: Grass clippings or paper shredded in a bowl of water.
- Station 7: Several maraschino cherries on a skewer, sitting in a shallow dish of water and/or their own juices (to keep them moist).

Beaks -

- One pair of chopsticks
- One small and one large clothespin
- One slotted spoon or pasta server
- One pair of tweezers
- One set of tongs
- Thin straws or coffee stirrers (1 per student)
- One pair of pliers

**Communicate** - Share which beak was best for each of the items in the bowls.

**Lesson 5:**

- Bird beaks lesson - [link](#)
- styrofoam peanuts
- clay, shaped like a fish,
- Pipe cleaner,
- Sunflower seeds
- Rice grains
- Cotton balls
- Grass clippings or paper shredded
- maraschino cherries
- One pair of chopsticks
- One small and one large clothespin
- One slotted spoon or pasta server
- One pair of tweezers
- One set of tongs
- Thin straws or coffee stirrers (1 per student)
- One pair of pliers
- bowls

**Episode 3**  
**Explain**  
**Days: 4 days**

**Lessons**

**Lesson 6:- Vocabulary Splash**

**Gather** - display all the unit's vocabulary words on the board. Read each word to the class with a brief explanation of the words.

**Reason** - partners sort these words in an open sort using their prior knowledge. Label each group of words.

**Communicate** - share how they sorted these words to the class.

**Lesson 7: Brainpop - Classifying Animals**

**Vocab. Focus** - choose a few vocabulary words to focus on. Students write the word, draw a picture of the word and write the word in a sentence in their journals.

**Gather** - Watch the brainpopjr video on classifying animals under science tab - [Classifying Animals](#)

**Reason** - Together Students and teacher classify mammals, reptiles and fish [Animal Classification Worksheets | K5 Learning](#)

**Communicate** - Draw an animal and label the parts of the animal that are characteristics of either a mammal, reptile or fish

**Lesson 8: What is a habitat?**

**Vocab. Focus** - choose a few vocabulary words to focus on. Students write the word, draw a picture of the word and write the word in a sentence in their journals.

**Gather** - Ask students what is a habitat? Discuss. Then read or listen aloud Cactus Hotel <https://www.youtube.com/watch?v=uSdU2B0t1Fg>

**Reason** - Ask Questions as your read - stop and ask How did a \_\_\_\_\_ use the cactus to survive? Repeat this question throughout the book.

**Communicate** - Turn to a partner and tell how all the

**Resources**

**Lesson 6:**

- **Vocabulary Words** - behavior, mimic, pollination, predatory, survival, ecosystem, species, habitat, characteristic, extinct

**Lesson 7:**

- Video - [Classifying Animals](#)
- [Animal Classification Worksheets | K5 Learning](#)

**Lesson 8:**

- Book - Cactus Hotel by Brenda Guiberson

<p>animals used the cactus to survive in their habitat. Go back to the questions - Can plants and animals of many diversities live in different habitats? How? Go back to the model created in the beginning of this unit. See if they need to add anything else to show how animals and plants live in their habitat together.</p>	
<p><b>Episode 4</b>  <b>Elaborate/Build New Content/Apply new Content</b>  <b>Days: 4 days</b></p>	
<p><b>Activity</b></p>	<p><b>Resources</b></p>
<p>1. <b>Choosing an Ecosystem/Habitat</b> where animals and plants coexist. Students choose an ecosystem like a rainforest, desert, forest, ocean etc. Research this kind of habitat and the animals and plants that live in it. Create this habitat as a diorama or picture and describe how the plants and animals interact with one another.</p> <p style="text-align: center;">Or</p> <p>2. <b>Design a solution</b> to a human problem by mimicking the <u>structure and function</u> of plants and/or animals and how they use their external parts to help them survive, grow, and meet their needs.</p>	<p>Materials from your classroom or from home.</p>
<p><b>Episode 5</b>  <b>Evaluate</b>  <b>Days: 3 days</b></p>	
<p><b>Assessment</b></p>	<p><b>Resources</b></p>
<p>Use the habitat model students created from the beginning of the unit. Add to the pictures all the animals and plants that live there. Recall how these plants and animals live together and help each other survive. Write an informational text about your habitat using Buncee or paper booklet.</p>	
<p><b>Common Core Curriculum Connections</b></p>	
<p><b>ELA/Literacy –</b></p> <ul style="list-style-type: none"> <li>● W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-LS4-1)</li> <li>● W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-LS4-1)</li> </ul> <p><b>Mathematics –</b></p> <ul style="list-style-type: none"> <li>● 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems. (2-LS4-1)</li> </ul>	

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