

Unit 1 - Motion and Stability	Grade 3	Days - 19
<p>Standards: Students who demonstrate understanding can:</p> <p>3-PS2-1. Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. [Clarification Statement: Examples could include an unbalanced force on one side of a ball can make it start moving; and, balanced forces pushing on a box from both sides will not produce any motion at all.] [Assessment Boundary: Assessment is limited to one variable at a time: number, size, or direction of forces. Assessment does not include quantitative force size, only qualitative and relative. Assessment is limited to gravity being addressed as a force that pulls objects down.]</p> <p>3-PS2-2. Make observations and/or measurements of an object’s motion to provide evidence that a pattern can be used to predict future motion. [Clarification Statement: Examples of motion with a predictable pattern could include a child swinging in a swing, a ball rolling back and forth in a bowl, and two children on a see-saw.] [Assessment Boundary: Assessment does not include technical terms such as period and frequency.]</p> <p>3-PS2-3. Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other. [Clarification Statement: Examples of an electric force could include the force on hair from an electrically charged balloon and the electrical forces between a charged rod and pieces of paper; examples of a magnetic force could include the force between two permanent magnets, the force between an electromagnet and steel paperclips, and the force exerted by one magnet versus the force exerted by two magnets. Examples of cause and effect relationships could include how the distance between objects affects strength of the force and how the orientation of magnets affects the direction of the magnetic force.] [Assessment Boundary: Assessment is limited to forces produced by objects that can be manipulated by students, and electrical interactions are limited to static electricity.]</p> <p>3-PS2-4. Define a simple design problem that can be solved by applying scientific ideas about magnets.* [Clarification Statement: Examples of problems could include constructing a latch to keep a door shut and creating a device to keep two moving objects from touching each other.]</p>		
<p>Anchoring Question:</p>		
<ul style="list-style-type: none"> • How do unbalanced and balanced forces such as gravity, friction, and magnetism affect my life and cause objects around me to move? 		
<p>Essential Questions:</p>		
<ol style="list-style-type: none"> 1. What is a force? 2. What is the difference between an unbalanced and a balanced force? 3. Why do some forces require two objects to touch, while others do not (magnetism)? 4. What causes an object to move? 5. How can I predict how an object will move? 6. How do “unseen” forces (i.e. friction, gravity, wind resistance) impact our lives? 7. How does understanding how magnets attract (pull) and repel (push) other objects help us? 		
<p>Enduring Understandings:</p>		

- Motion is caused by a push or a pull. A push or pull is called a force. An object can be set in motion by forces that come from direct contact, moving air, magnets or by gravity pulling it down toward the earth. Pushes and pulls can start motion, stop motion, speed it up, slow it down or change its direction.
- A magnet's push or pull can cause a magnetic object or another magnet to move without direct contact. The strength of a magnet's attractive force can be measured by recording the number or mass of the objects it attracts or the distance.
- The greater the force, the greater the change in motion.
- The amount of force needed to move (accelerate) an object is related to the object's mass. The greater the object's mass, the greater the force needed to move it, stop it or change its speed or direction.
- When an object does not move in response to a push or a pull, it is because another equal-sized force, such as gravity or friction, is counteracting the push or pull. Gravity (the Earth's pulling force) and friction (the force between two surfaces) are common forces that work against motion.
- Different forces are responsible for the transfer of the different forms of energy (namely kinetic and potential).

Storyline Narrative / Big Ideas:

This introductory unit on forces will give students a new understanding of the invisible pushes and pulls that operate in the world around them. They will gain a very basic understanding of Newton's Three Laws of Motion, which involve concepts such as inertia, momentum, and acceleration.

In addition, students learn to determine the effects of balanced and unbalanced forces on the motion of an object as well as the cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

What students learn in this unit will connect to the world around them, leading them to think about such things as the force of friction as they slide down a playground slide, how forces acting on an object can affect the object's motion, or the invisible force that makes magnets cling to certain objects / surfaces. Hands-on activities focus on engineering, investigation, and discovery.

Vocabulary Words: force, motion, push, pull, potential energy, kinetic energy, Newton's Laws, gravity, magnetism, friction, pendulum, swing, inertia, balanced, unbalanced

Science and Engineering Practices	Disciplinary Core Ideas	Cross Cutting Concepts
<p><u>Asking Questions and Defining Problems</u> Asking questions and defining problems in grades 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.</p> <p>Ask questions that can be investigated based on patterns such as cause and effect relationships. (3-PS2-3)</p>	<p>PS2.A: Forces and Motion: Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can</p>	<p>Patterns - Patterns of change can be used to make predictions.</p> <p>Cause and Effect - Cause and effect relationships are routinely identified. Cause and effect relationships are routinely identified, tested, and used to explain change.</p>

<p>Define a simple problem that can be solved through the development of a new or improved object or tool. (3-PS2-4)</p> <p><u>Planning and Carrying Out Investigations</u></p> <p>Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.</p> <p>Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-PS2-1)</p> <p>Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (3-PS2-2)</p>	<p>cause changes in the object’s speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this level.)</p> <p>The patterns of an object’s motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.)</p> <p>PS2.B: Types of Interactions:</p> <p>Objects in contact exert forces on each other. (3-PS2-1) Electric and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other.</p>	
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Consolidated Supply List:

- rulers
- stiff cardboard (needs to measure at least 12" by 16")
- different sized rubber bands
- styrofoam or craft foam
- sandpaper
- buttons
- string
- Marbles
- popsicle sticks
- large straws
- yard/meter stick
- paper plates
- round magnets (2 per student),
- paper clips
- plastic cups
- Mystery Science subscription
- Book - Equal Shmequal by Virginia Kroll
- Brainpop subscription

See additional items listed in the lessons that may be donated from home to plan for future lessons

Episode 1
Engage/Elicit Ideas
Days: 2 days**Lessons****Lesson 1: Phenomena #1**

Gather - Watch Newton's cradle video - [video](#)

Reason - Ask students to draw observations of what happens in their science notebook. If you feel students need more guidance, use a [beginning, middle end graphic organizer](#)

After students draw a picture, ask students to try and explain in words what is happening to the other spheres once the sphere on the end hits it. (What is actually happening is that the force from the one ball is being transferred to the other balls as they touch each other, causing the last ball to swing upward)

Communicate - Ask guiding questions such as:
"Who wants to try and explain what they think is happening?"
"What do you think causes the sphere on the opposite end to move?"
"Do you think a force can be transferred from one object to the next?"

Resources**Lesson 1:**

- [video](#)
- Newton's cradle [Beginning, middle end graphic organizer](#)

<p>Have students brainstorm a list of questions that they have about how this works. The teacher will chart the questions on the board. (Newton’s Cradle proves that Newton’s 3rd Law (For every action, there is an equal and opposite reaction) is true. Keep referring back to Newton’s cradle throughout the unit as students learn about Newton’s 3rd Law, kinetic energy (what starts as potential energy is transferred to kinetic energy as energy is transferred from one sphere to another as the energy moves down the line), potential energy (When the spheres are raised before they drop, they have potential energy - just like a roller coaster at the top of the hill), and that a force can be transferred from one object to another.</p> <p>Lesson 2: Phenomena #2 Gather - Watch video - Crazy Magnetic Goo https://www.youtube.com/watch?v= WYTt8VEOxE&t=54s</p> <p>Reason - Students draw a model of one phenomena that they saw in the video. Write down what they notice and wonder.</p> <p>Communicate - Share noticings and wonders with the class. Make a claim about magnets.</p>	<p>Lesson 2:</p> <ul style="list-style-type: none"> • Video - https://www.youtube.com/watch?v= WYTt8VEOxE&t=54s
<p>Episode 2 Explore Days: 6 days</p>	
<p>Lessons</p>	<p>Resources</p>
<p>Lesson 3: Balanced and Unbalanced Forces Experiment “How can you win a game of tug of war against adults Gather - _Gather the students on the carpet and explain that they will be learning about balanced and unbalanced forces by thinking about the game “Tug of War.” Ask students - What do we know about the game “Tug of War?” What causes a team to win or lose?</p> <p>Reason - Show students the Mystery Science video “How can you win a game of tug of war against adults” (part 1: Exploration).</p> <ul style="list-style-type: none"> - Have students write down their ideas in their science notebook. Use this possible recording sheet. Either students can all use this recording sheet, or the teacher can use it under the document camera to chart the students ideas. Here’s a sample recording sheet with some really great ideas that the students came up with on how 	<p>Lesson 3:</p> <ul style="list-style-type: none"> • Mystery Science Video - “How can you win a game of tug of war against adults” • Tug of War Recording Sheet

to make the students win against adults.

Communicate - Class Discussion: (cause and effect)

- How do you win the game Tug of War?
- How do you lose the game Tug of War?
- What causes a team to win or lose?
- How do you think this applies to balanced or unbalanced forces?

**Make sure to stop the videos before the “Hopper Popper” hands on activity - they will do that the following day.

Lesson 4: Creating and Experimenting with “Hopper Poppers”

Gather - Gather the students on the carpet and review their ideas from the previous day. Introduce the [Mystery Science Experiment](#) and walk students through the construction and experimentation of “Hopper Poppers.”

Reason - Have students work in partnerships to experiment with their poppers. Have partnerships discuss: How did the rubber band affect the popper in this experiment? How did it act as a force?

Communicate - Class Discussion: How did this experiment relate back to the tug of war game?
Journal Entry - Cause and effect - write about how you and your partner caused the hopper to go higher.

Possible extension: Play a game of tug of war!

Lesson 5: Friction and Pattern of Motion

Experiment: [How Can you Go Faster Down a Slide?](#)

Introduction to the Experiment

Gather - Gather the students on the carpet and explain that we are going to explore slides and how we can make people go slower or faster down a slide.

- Show the video (part 1 - about 15 mins) in the Mystery Science Lesson. Stop to discuss the questions posed by the narrator. Stop the video at the “natural stopping point.”

**By this time, students will have looked at their materials and made some theories based on what they learned in the phenomenon videos - this is a natural stopping point, giving time for students to reflect on their ideas.*

Reason - Turn and Talk:: What is your idea? How do you think you can go faster down a slide WITHOUT making it steeper? (cause and effect)

Lesson 4:

- Mystery Science Video - [“How can you win a game of tug of war against adults”](#)
- [High Hop Scorecard](#)
- [Hopper Popper Teacher Tips](#)
- [Launch Pad Printout](#)
- Pen
- Rulers
- Scissors
- Chipboard (or recycled cardboard)
- Rubber Bands (different sizes and thicknesses, or hair ties)
- Science Notebook

Lesson 5:

- experiment - [How Can you Go Faster Down a Slide?](#)

Communicate - Draw a diagram in your science notebook of your idea. Challenge! Try to use the vocabulary words introduced in the lesson: friction, gravity.

Lesson 6: Friction Investigation

Gather - Bring students to the carpet and pose the question:

- What ideas did you have from yesterday's time working with your materials?
- How do you and your group think you can make your object go down the slide faster?

Reason - **Go through the steps and complete the experiment with trails.** [Friction Investigation!](#) Work with your groupmates to experiment what makes the "sliders" go fastest.

Communicate - After the experiment: Reflect with your group:

- What made the sliders go the fastest?
- Is that what you expected?

Journal Entry - Draw and reflect in your science notebook using pictures, labels, vocabulary and an explanation of how your slides worked..

Lesson 7: Force and Motion

Experiment: [Rock-a-Bye Pendulum](#)

Gather - Gather students on the carpet and show them a pendulum picture from google, Ask: What do you think happens when you apply force to an object in motion?

Reason - Conduct the experiment: Have students work in their partnerships (or small groups) to construct the pendulum and experiment (all of those instructions are here on the [Rock a Bye Pendulum Worksheet](#)).

Look for patterns in the data. What do you notice?

Communicate - After the experiment:

- Discuss the patterns they saw in their data on the recording worksheet..
- Discuss the question at the end of the experiment:
- Name three things that could happen when a force acts on a moving object.
- Have students reflect in their science notebook using a diagram, labels and writing to describe how a force affects an object.

Lesson 6:

- [Friction Investigation Worksheet](#)
- Rulers
- Chipboard (or cardboard for "slides")
- Foam (styrofoam)
- Glue / Tape
- Buttons
- Pennies (to be used as weights on "sliders")
- Hardcover books (to create incline)
- Science Notebook

Lesson 7:

- Ruler
- Tape
- 2 feet of string
- 2in ball
- [Rock A Bye Pendulum Worksheet](#)
- Marble
- Popsicle Sticks
- Large Straw
- Yard or Meter Stick
- Science Notebook

Possible extension:

- Newton's 2nd Law virtual simulation
https://phet.colorado.edu/sims/html/forces-and-motion-basics/latest/forces-and-motion-basics_en.html
- Friction Video Demonstration:
<https://video.link/w/woRS>

<p>Lesson 8: The Magnetic Force Field Gather - Have students gather on the carpet and ask students what a magnet is. They will probably mention fridge magnets or point out magnets in the classroom. Ask them if they ever took the time to play with magnets and investigate all the cool properties they have. Explain the Experiment's objective. Investigating the Magnetic Force Field</p> <p>Reason - Pose the questions: How far do you think a magnet can reach?" Allow them to have a short discussion and set them up for the experiment. The procedure can be found here.</p> <p>Communicate - At the conclusion of the experiment, partnerships and / or groups will discuss the findings from their experiment and form theories about what they learned about magnetic fields. Journal Entry - Have them draw a diagram with labels in their scientific notebook of the magnetic field.. They can then explain their drawings to their groups / the class.</p>	<p>Lesson 8:</p> <ul style="list-style-type: none"> • Bar magnet • 20+ large metal paper clips • Roll of masking tape • Ruler • Science journal • Pencil to record the experiment, data, and results.
<p>Episode 3 Explain Days: 5 days</p>	
<p>Lessons</p>	<p>Resources</p>
<p>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.</p> <p>Reason - partners sort these words in an open sort using their prior knowledge. Label each group of words.</p> <p>Communicate - share how they sorted these words to the class.</p> <p>Lesson 8: Balanced and Unbalanced 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.</p> <p>Gather - Read Aloud Equal Schmequall.by Virginia</p>	<p>Lesson 7:</p> <ul style="list-style-type: none"> • Vocabulary words - force, motion, push, pull, potential energy, kinetic energy, Newton's Laws, gravity, magnetism, friction, pendulum, inertia, balanced, unbalanced • Sentence Strips of vocab words or display digitally <p>Lesson 8:</p> <ul style="list-style-type: none"> • Equal Shmequal • Activity - BalancedUnbalancedForcesNotes-1.pdf

Kroll Discussion questions:

- Use this book to explain the concept of balanced and unbalanced forces. Point to different pictures in the book and ask students to identify if the forces are balanced or unbalanced.
- Explain that tug of war isn't just a game of pulling, but also pushing. The floor exerts an upward force on your feet, just as your feet push down on the floor.
- Newton's 3rd Law can also be explained using tug of war.

Reason - As a class, complete the activity and paste into your science journal.

[BalancedUnbalancedForcesNotes-1.pdf](#)

Communicate - Turn and talk to a partner and explain the difference between unbalanced and balanced forces.

Lesson 9: Potential and Kinetic Energy

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 Brainpop - Forms of Energy
<https://www.brainpop.com/science/energy/formsenergy/>

Reason - partners sort pictures into either potential or kinetic energy [PotentialvsKineticEnergy](#)

Communicate - Share sorts

Lesson 10: Motion and Forces

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 - Show students the phenomena video again. Ask students to go back to their model of the phenomena from the beginning of the unit. They should now label the model with the vocabulary words they have used throughout the unit: push, pull, gravity, friction

Reason: Watch the following videos of how a rollercoaster works and potential and kinetic energy.
<https://www.youtube.com/watch?v=YyxjQrOJwWg>
https://www.youtube.com/watch?v=zCKenikIH_c

Communicate: Have students add any more labels like

Lesson 9:

- Video - <https://www.brainpop.com/science/energy/formsenergy/>
- Activity - [PotentialvsKineticEnergy](#)

Lesson 10:

- <https://www.youtube.com/watch?v=YyxjQrOJwWg>
- https://www.youtube.com/watch?v=zCKenikIH_c

potential and kinetic energy to their model. Have students share their models with the class.

Lesson 11: Learning more about Magnets

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 - Gather students on the carpet and ask: “From our previous experiment, what have we learned about magnets and magnetic fields?” Show Brainpop’s [Magnetism Video](#)

Pose the following questions for students to answer with their partner or group:

- “What does this video teach us about magnets?”
- “Does a magnet have to be touching an object to make it move?”
- “What happens if a magnet moves far, far away from an object?”

Reason - Provide students with two magnets, paper plates, and a maze printed from online. Have them glue the maze to the paper plate. Students should place one magnet underneath the plate and the other magnet on top of the plate. While holding the magnet underneath the plate, students should try and see if they can get the magnet on top to the center of the maze.

Communicate - As a class complete the Brainpop quiz on Magnetism.

Lesson 11:

- **Video:** [Magnetism Video](#)
- [Magnet maze](#)
- Paper plates
- Two magnets per student/ pair of students
- [Circular mazes printed from the internet such as this one](#)

Episode 4
Elaborate/Build New Content/Apply new Content
Days: 3 days

Activity

Lesson 12: Marble Run Challenge

Day 1 - Marble Run Challenge (3 days)
 Students will work in groups to create a marble run, which replicates a small roller coaster. Their challenge is to create a track that makes a marble run for the longest period of time.

Student designs will place their marble on the track, and the teacher will time each marble as it flows through the track.

There are two methods of doing this. Option 1: If you have cardboard tubes available, groups of students can

Resources

Lesson 12:

Option 1:

- Paper towel rolls
- Toilet paper rolls
- Wrapping paper rolls
- Cardboard
- 4 - 6 pieces of thick foam board or large flat cardboard pieces (for students to build on top of)
- Tape (masking or duct works best)

use these, attach them to the foam or cardboard board, and use these to make their track. See this [resource](#) for more information about this type of marble run.

The second method if you don't have cardboard tubes available, is to print roller coaster foldable pieces ([found here](#)) onto cardstock. Students will work in groups to fold and assemble them. The video shows how. You may still want to provide students with a board to build on top of.

Gather: Say to students, "Today you are going to use what you learned about forces and motion to build your own marble run."

To get students thinking, quickly review some important concepts that they learned by asking questions such as

- "What is the vocabulary term that we learned for what a roller coaster has when it is at the top of the lift hill?" (potential energy)
- Do you think it is important for your roller coaster to start at a high place and end at a low place?
- How can you build pieces that work like a real roller coaster?

It may be helpful to show students the video of Nitro that they watched at the beginning of the unit to jog their memories.

Students should get together with their groups and begin planning. They should draw or write their plan in their science notebooks.

Once students are finished planning, they should check with the teacher to get approval before beginning to build.

Day 2: Students are given the entire period to receive materials and time to build. The teacher should walk around and help students test their designs throughout the period so that students have time to make changes if necessary.

Day 3: Students finish up their designs, and the teacher begins to time the marble runs to see how long the marble can flow through the track.

Gather students as a whole class and discuss what worked and what didn't work. Have students respond to this question in their journals. "If you had unlimited time to design your creation, what would you work to improve about your roller coaster?" If time allows, have students share their journal entries.

- Plastic cups
- Scissors
- [Marble Run Information PDF](#)
- marbles

Option 2:

- Cardstock with [roller coaster pieces](#) printed on it
- [Sample Paper Roller Coaster](#) video that shows students how to do it.
- 4 - 6 pieces of thick foam board or large flat cardboard pieces (for students to build on top of)
- Tape
- Scissors
- Marbles
- Plastic cups

Possible extension: Give students time to improve their designs with their groups.	
Episode 5 Evaluate Days: 3 days	
Assessment	Resources
<p>Lesson 13: Inventions for Tomorrow: Write an essay defining a simple design problem using magnets to make it better. See lesson for some examples: https://betterlesson.com/lesson/637343/5-inventions-of-tomorrow-that-will-rely-on-magnetism-a-writing-activity</p> <p>Rubric - https://drive.google.com/file/d/1pTDY1pFsJxxxEEFZHaNuP_cMMCNyPYBi/view?usp=sharing</p>	
Common Core Curriculum Connections	
<p>ELA/Literacy –</p> <ul style="list-style-type: none"> ● RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-PS2-1),(3-PS2-3) ● RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-PS2-3) ● RI.3.8 Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence). (3-PS2-3) ● W.3.7 Conduct short research projects that build knowledge about a topic. (3-PS2-1),(3-PS2-2) ● W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-PS2- 1),(3-PS2-2) ● SL.3.3 Ask and answer questions about information from a speaker, offering appropriate elaboration and detail. (3-PS2-3) <p>Mathematics –</p> <ul style="list-style-type: none"> ● 3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (3-PS2-1) 	
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 2 - Ecosystems/ Interactions		Grade 3	Days - 14
<p>Standards: Students who demonstrate understanding can: 3-LS2-1. Construct an argument that some animals form groups that help members survive.</p>			
<p>Question:</p> <ul style="list-style-type: none"> How does being a part of a group benefit animals? 			
<p>Essential Questions:</p> <ol style="list-style-type: none"> How does being a part of a group help animals survive? What role(s) do different animals in the group fulfil? How do different groups of animals vary in size? What are some ways that organisms interact within ecosystems? 			
<p>Enduring Understandings:</p> <ul style="list-style-type: none"> Some animals form groups in order to survive. Forming groups can be helpful to some animals in order to find food, shelter, and protection against predators. Groups of animals may vary in function and size. Animals interact with the nonliving parts of their environment to form an ecosystem. (soil, water, air, All animals and most plants depend on both other organisms and their environments for their basic needs. 			
<p>Storyline Narrative / Big Ideas: This introductory unit will give students an understanding that organisms rely on each other in unique relationships that ensure each other's survival. Students will study different animal groups and learn about how they rely on each other to get food, defend themselves, and adjust to changes. Students will make lots of observations about different animal groups and come to the big understanding that living in a group helps animals survive and thrive.</p>			
<p>Vocabulary Words: colony, roles, population, competition, resource, organism, survival, behavior</p>			
Science and Engineering Practices	Disciplinary Core Ideas	Cross Cutting Concepts	
<p>Engaging in Argument from Evidence Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).</p>	<p>LS2.D: Social Interactions and Group Behavior: Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different</p>	<p>Cause and Effect - Cause and effect relationships are routinely identified and used to explain change.</p>	

Construct an argument with evidence, data, and/or a model.	functions and vary dramatically in size.	
Consolidated Supply List: <ul style="list-style-type: none"> • Science Notebooks • Mystery Science subscription • Epic Books subscription • Box • Animal figurines 		
Episode 1 Engage/Elicit Ideas: Days: 1 day		
Lessons	Resources	
Lesson 1: Phenomena Gather - Show the two phenomenon videos about how ants work together. Video 1: Colony of Ants Dragging a Worm All Together Video 2: Weaver Ants Build a Horizontal Bridge Reason - Have students draw and label a diagram of what they saw and hypothesize what the ants are doing (through writing or drawing). Students write down what they notice and wonder about both of the ant colonies. Noticing/Wonders pdf - link Communicate - Chart common ideas on a chart paper that you may return to over time. Possible Prompts: <ul style="list-style-type: none"> • What do you think the ants were doing? • Why do you think the ants were behaving that way? • Does this remind you of any other animal group you've seen? Have a class discussion: encourage students to share their ideas and hypotheses about the ants in the videos.	Lesson 1: <ul style="list-style-type: none"> • Phenomenon: • Video 1: Colony of Ants Dragging a Worm All Together • Video 2: Weaver Ants Build a Horizontal Bridge • Noticing/Wonders pdf - link 	
Episode 2 Explore Days: 3 days		
Lessons	Resources	
Lesson 2: Mystery science Why do dogs wag	Lesson 2: <ul style="list-style-type: none"> • Mystery Science lessons - Why 	

their tails?

****Please preview science activity prep to understand how to prepare and facilitate this lesson**** [Why do dogs wag their tails?](#)

Gather - Watch introduction videos on animals and how they communicate. [Why do dogs wag their tails?](#)

Reason - In the next part of the Mystery Science lesson students will go on a virtual field trip to make observations of how animals communicate. Students will make a field journal to record their journey and observations. Follow steps in the Mystery Science lesson.

Communicate - Discuss finding with the class. Students independently complete the assessment and reflection sheet. [Reflection](#)

Lesson 3: How does this animal benefit from living in groups?

Gather - Ask students - How many members are in your family? What are the important roles each member contributes to your survival? Today we look at 4 different animals and discover how many members are in their family and how they each contribute to their survival.

Reason - In groups students will research the 4 different groups of animals finding what the benefits of living in groups is. Students record their findings along with the number of animals in a pack.

[Animal Groups Reading Passages.docx](#)
[Groups Recording Sheet](#)

Communicate - Discussion -Students reflect on how their families are the same or different from these animals when it comes to survival.

Lesson 4: Roles of Bees

Gather - Today we are going to do a gallery walk to learn about the roles of the bees in a hive. (Before this lesson, the teacher should print out [cards](#) and hang them around the classroom. It may also be a good idea to provide your students with a note-taking sheet/ graphic organizer if you feel it's necessary. Students can also take notes in their science notebooks)

Reason - As students go around, students will jot down their job on the recording sheet. [Roles of Bees](#)
Teacher circulates the room and listens to class

[do dogs wag their tails?](#)

- [Reflection](#)

Lesson 3:

- Reading - [Animal Groups Reading Passages.docx](#)
- [Groups Recording Sheet](#)

Lesson 4:

- Roles of Bees - [cards](#)
- Recording Sheet - [Roles of Bees](#)
- [CauseandEffectGraphicOrganizer](#)

<p>discussion. Ask guiding questions such as,</p> <ul style="list-style-type: none"> • “Wow, what do you think would happen if this type of bee didn’t exist?” • How would the rest of the bees be affected? • Could the hive live on without these bees?” <p>Communicate - Students should come back to their seats to choose which bee they would want to be in the colony. Then complete the cause (job)and effect of this job on the stability of the colony. Teachers - you may want to model this task first. CauseandEffectGraphicOrganizer</p>	
<p>Episode 3 Explain Days: 5 days</p>	
<p>Lessons</p>	<p>Resources</p>
<p>Lesson 5:- 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.</p> <p>Reason - partners sort these words in an open sort using their prior knowledge. Label each group of words.</p> <p>Communicate - share how they sorted these words to the class.</p> <p>Lesson 6: Honey 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.</p> <p>Gather - The Honeybee Man Teaching point: Today I want to teach you that honey bees perform a dance in order to help the other bees find good and resources. Engage: Sometimes even dances as humans give us directions! Play a dance that gives directions and ask students to follow the directions.</p> <ul style="list-style-type: none"> • Play bit of Cha Cha slide that has the lyrics/ directions The Cha Cha Slide Dance • Students should dance along • Then play it instrumentally. https://www.youtube.com/watch?v=KzukIbINjSI • Have students try to dance. Can they follow it? <p>Reason - “Ask students if it was hard to follow the movements of the song without the words. Guess what.</p>	<p>Lesson 5:</p> <ul style="list-style-type: none"> • Vocabulary Words - colony, roles, population, competition, resource, organism, survival, behavior • Sentence Strips of vocab words or display digitally <p>Lesson 6:</p> <ul style="list-style-type: none"> • Bee dance game: https://askbiologist.asu.edu/bee-dance-game/

Bees have to follow directions from other bees just by dancing!"

Then, show students the waggle dance video. A short video on their "dance"

<https://www.youtube.com/watch?v=12Q8FfyLLso>

Have students go to this [game](#): Read directions and explain to students. Teacher will demo one time.

Communicate - Have students come back together and ask them if they were able to find the correct nectar the first time. Ask if you think it would be hard to follow directions without the teacher talking.

Lesson 7: Insects Work Together

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 - Students watch video Aesop Fable The Ant and the Grasshopper -

https://www.youtube.com/watch?v=_svBrlehmMo

Reason - Students will do a group research project. Using this resource - [Insects That Work Together](#) and [How Do Insects Work Together?](#)

students will research one of the insects below. Separate students into 3 groups.

Group 1: Honey Bees

Group 2: Wasps

Group 3: Ants

Group 4: Termites

They can present their research using a JamBoard, Google Slide, or Paper Diagram.

Communicate - Have each group share, then discuss:

- How were the different groups of insects similar?
- How were the different groups of insects different?
- How do you think these groups work together to survive?
- Why do you think they live and work together?

Lesson 8: Animals Working Together

Gather - Read Aloud - Have you ever seen a smack of jellyfish? An animal alphabet. By Sarah Smit

Reason - Students watch a series of videos to learn about how these animals work in groups to get food
Dolphins [Dolphins trick fish with mud "nets" | One Life |](#)
Whales

Lesson 7:

- Epic Book - [Insects That Work Together](#)
- Epic Book - [How Do Insects Work Together?](#)
- Aesop Fable video - https://www.youtube.com/watch?v=_svBrlehmMo

Lesson 8:

- Videos [Dolphins trick fish with mud "nets" | One Life | BBC](#) And [Whales' Bubble Net Fishing | Nature's Great Events | BBC Earth](#)
- Cause and Effect Template [3-LS2-1+Animal+Group+Effects+](#)

<p>Whales' Bubble Net Fishing Nature's Great Events</p> <p>Communicate - As a class fill out the cause and effect template - 3-LS2-1+Animal+Group+Effects+(Student+Version).pdf</p>	<p>(Student+Version).pdf</p>
<p>Episode 4 Elaborate/Build New Content/Apply new Content Days: 2 days</p>	
<p>Activity</p>	<p>Resources</p>
<p>Design an Experiment</p> <p>In this project, students will work in a group. They will be provided with a box with a flag attached. They will plan and design an experiment to test who is better at defending their territory: A single animal, or a group of animals. The box will be their “territory” that they must protect, and other students will try to take the box. For teacher directions, click here.</p> <ul style="list-style-type: none"> Note: rules should be discussed as a class ahead of time as to what will be allowed and what will not be allowed when “defending” their box Have students come up with possible guidelines and rules as a class before running the experiment. Students argue that working in groups is better than working alone. 	<ul style="list-style-type: none"> Click here to see the “Who Has The Advantage” Teacher Overview Box with a paper flag Animal figurines or pictures of animals to tape, attach to “Territory” boxes Open space (consider going outside on the playground/ to the gym if available) For part 3, supplies they need to represent one of the three scenarios of environmental change. Teacher Notes for Part 3
<p>Episode 5 Evaluate Days: 2 days</p>	
<p>Assessment</p>	<p>Resources</p>
<p>Writing Task:</p> <p>Give students the option of how they want to synthesize all they have learned. Students can be scored on the third grade Narrative Writing rubric, or the third grade Informational Writing Unit. This may take up to two days for students to complete.</p> <p>Prompt 1: Write a story from the viewpoint of an ant explaining your role in helping the colony survive.</p> <p>Prompt 2: Compare the group roles of humans and ants in being a part of a group to benefit the whole . How are they alike?</p>	<p>Narrative Writing Rubric</p> <p>Informational Writing Rubric</p>

How are they different?

Common Core Curriculum Connections

- ELA/Literacy**
- RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS2-1)
 - RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-LS2-1)
 - W.3.1 Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-LS2-1)
- Mathematics**
- 3.NBT Number and Operations in Base Ten (3-LS2-1)

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		

Differentiated 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

Standards:

Students who demonstrate understanding can:

3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. [Clarification Statement: Examples of data could include type, size, and distributions of fossil organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and fossils of extinct organisms.] [Assessment Boundary: Assessment does not include identification of specific fossils or present plants and animals. Assessment is limited to major fossil types and relative ages.]

3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. [Clarification Statement: Examples of cause and effect relationships could be plants that have larger thorns than other plants may be less likely to be eaten by predators; and, animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring.]

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. [Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.]

3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.* [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.] [Assessment Boundary: Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.]

Anchoring Question:

- How do organisms change, survive and evolve over time?

Essential Questions:

1. What is biological evolution?
2. How do organisms change over time?
3. What causes organisms to change over time?
4. What do fossils tell us about the living organisms of yesterday and of today?
5. How do animals change over time to survive?
6. What happens to the plants and animals when the environment changes?
7. How do humans impact how animals adapt?
8. Why do some animals survive in some habitats but not others?

Enduring Understandings:

- Students should understand that some animals that lived on earth long ago are no longer alive today (analyze and interpret data from fossils)
- Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.
- Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.*

Storyline Narrative / Big Ideas:

To explore biological evolution, students study fossils of dinosaurs, focusing on their teeth to determine what food they eat. Students learn that over time, an environment changes by exploring how a place that is now the desert is a place where whales once lived. They further their understanding of environmental changes over time by exploring books that explain that sometimes changes to an environment are caused by humans, while other times they are caused by a lack of resources.

Vocabulary Words: extinction, population, region, endangered, species, independent, climate, adaptations, deforestation, evolution, environment, habitat, natural selection

Science and Engineering Practices	Disciplinary Core Ideas	Cross Cutting Concepts
<p><u>Analyzing and Interpreting Data</u> Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.</p> <p>Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS4-1)</p> <p><u>Constructing Explanations and Designing Solutions</u> Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify</p>	<p>LS2.C: Ecosystem Dynamics, Functioning, and Resilience: When the environment changes in ways that affect a place’s physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die.</p> <p>LS4.A: Evidence of Common Ancestry and Diversity: Some kinds of plants and animals that once lived on Earth are</p>	<p>Cause and Effect - Cause and effect relationships are routinely identified and used to explain change. (3-LS4-2),(3-LS4-3)</p> <p>Scale, Proportion, and Quantity - Observable phenomena exist from very short to very long time periods. (3-LS4-1)</p> <p>Systems and System Models - A system can be described in terms of its components and their interactions. (3-LS4-4)</p>

<p>variables that describe and predict phenomena and in designing multiple solutions to design problems.</p> <p>Use evidence (e.g., observations, patterns) to construct an explanation. (3-LS4-2)</p> <p><u>Engaging in Argument from Evidence</u> Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).</p> <p>Construct an argument with evidence. (3-LS4-3)</p> <p>Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4)</p>	<p>no longer found anywhere.</p> <p>Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments.</p> <p>LS4.B: Natural Selection: Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing.</p> <p>LS4.C: Adaptation: For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.</p> <p>LS4.D: Biodiversity and Humans: Populations live in a variety of habitats, and change in those habitats affect the organisms living there.</p>	
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Consolidated Supply List:

- 2-liter plastic soda bottle
- Cotton or felt strips
- Growing medium - coconut coir or hydroponics clay pebbles
- green leafy plant - lettuce, spinach, oregano or basil
- Purified, filtered or bottled water
- Flora Grow
- Dot stickers
- Book - Backyard Bear by Anne Rockwell

- Mystery Science subscription
- Brainpop subscription
- Newsela subscription

Episode 1
Engage/Elicit Ideas
Days: 1 day

Lessons

Resources

Lesson 1: A Tale of Two Birds

Gather - Show anchor phenomenon video <https://www.calacademy.org/educators/a-tale-of-two-birds> about the tale of two birds. The video raises good questions that will get students excited for the unit. Students write down their noticings and wonderings. [NoticingandWonderingTemplate](#)

Reason - Discuss what they noticed from their noticings and wonderings chart. Ask students to think about/discuss the questions the video raises:

- Have these juncos evolved into a different species in such a short amount of time?
- Are they different species?
- What is going on?
- Could it be possible that all of these different juncos once looked alike?

Communicate - Create a KWL chart based on the unit's question. What do they know about how organisms change, survive and evolve over time?

Lesson 1:

- Video - <https://www.calacademy.org/>
- Template - [NoticingandWonderingTemplate](#)

Episode 2
Explore
Days: 5 days

Lessons

Lesson 2: How do we know what dinosaurs looked like?

Mystery Lesson - [How do we know what dinosaurs looked like?](#)

Gather - Ask students - How do we know what dinosaurs looked like? The teacher will play the intro. video for students on the mystery science lesson above.

Reason - Students will complete the what do these animals eat worksheet. [worksheet](#)

Communicate - Students share their responses, and discuss. Close lesson as a whole group. "Today we learned that looking at an animal's teeth can tell us what they ate. We will continue to learn that analyzing the body parts of fossils can help us learn about the environment in which they lived.

Lesson 3: Can Natural Selection Happen without People?

Mystery Lesson - [Can selection happen without people?](#)

Gather - What do you think natural selection means? Tell the students, in this lesson they will learn about an example of how nature, not human beings, can slowly change the appearance of an animal using the process of selection.

Reason - In the activity, Lizard Island, students simulate how natural selection affects a group of tree-climbing green lizards when their island is invaded by hungry brown lizards.

Communicate - Quick write - what is natural selection. Use examples to explain.

Lesson 4: Hydroponics STEM Project

Lesson - [Hydroponics Made Easy | STEM Activity](#)

Gather - Discuss with students that our environment is changing due to human activity, so we need to think of other ways to grow plants. In today's lesson, the students will begin to explore the question "Why would someone choose hydroponic planting or soil planting?" After the students gather, I will ask what they know about the prefix "hydro" and if they have ever heard of it. I will also explain that "hydro" means water

Lesson 2:

- Lesson - [How do we know what dinosaurs looked like?](#)
- Dinosaur [worksheet](#)

Lesson 3:

- Worksheet - [How many lizards?](#)
- Worksheet - [Baby lizard](#)
- Worksheet - [Adopt a lizard](#)
- Lesson - [Can selection happen without people?](#)

Lesson 4:

- Lesson - [Hydroponics Made Easy | STEM Activity](#)
- 2-liter plastic soda bottles
- Cotton Ball strips
- Growing medium - coconut coir or hydroponics clay pebbles
- green leafy plant - lettuce, spinach, oregano or basil
- Purified, filtered or bottle water
- Flora Grow

<p>Reason - Do you think plants can grow without soil? If you've tried growing veggies, you probably planted the seeds or seedlings in soil. Soil gives the plants the nutrients they need to grow. However, plants can grow without soil, too, using a process called <i>hydroponics</i>. In this activity, you will transform a 2-liter soda bottle into a mini-garden that needs only light, air, and nutrient-rich water to grow! Students will create the hydroponics planting using the lesson instructions above. Teachers - To compare the difference between hydroponics and solid, make one class sample with soil.</p> <p>Communicate - Students when they finish setting up experiments will draw a diagram for the hydroponics and the class soil sample. They will also measure the plant lengths on to this recording sheet - Hydroponics.docx Note - For the next few days, check daily to make sure the area around the seed or tiny plant is moist. Add a little water if needed. As the plant grows, its roots will extend deeper and get better access to the water and nutrients sucked up by the wick.</p>	<ul style="list-style-type: none"> Aluminum foil
<p>Episode 3 Explain Days: 9 days</p>	
<p>Lessons</p>	<p>Resources</p>
<p>Lesson 5:- Vocabulary Splash Hydroponics - check daily to make sure the area around the seed or tiny plant is moist.</p> <p>Gather - display all the unit's vocabulary words on the board. Read each word to the class with a brief explanation of the words.</p> <p>Reason - partners sort these words in an open sort using their prior knowledge. Label each group of words.</p> <p>Communicate - share how they sorted these words to the class.</p> <p>Lesson 6: Where Can You Find Whales in the Desert? Lesson - Where can you find whales in a desert?</p> <p>Hydroponics - check daily to make sure the area around the seed or tiny plant is moist</p>	<p>Lesson 5:</p> <ul style="list-style-type: none"> Vocabulary words - extinction, population, region, endangered, species, independent, climate, adaptations, deforestation, evolution, environment, habitat, natural selection <p>Lesson 6:</p> <ul style="list-style-type: none"> Lesson - Where can you find whales in a desert? Dot stickers Fossil Dig - mystery-science (2).pdf Fossil Dig Worksheet -

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 - Today I want to teach you that over time, animals' habitats change. This can cause them to die out or be forced to move to a new place. The teacher will show students this Mystery Science [Episode](#). (In this episode, Doug finds a shark tooth on the ground in Indiana, which is a landlocked state.

Reason - In the activity, Fossil Dig, students use paper to create a model fossil dig. They identify traits of fossils to determine what the habitat looked like when these organisms were alive. Then they use this information to figure out where some Mystery Fossils belong in their fossil dig.

Communicate - Students discuss findings. Play wrap up video:

Have students choose one of the following questions to answer in their journals.

- 1) How do you think land changing over time would make an animal's body change over time?
- 2) Imagine you were a shark/ other sea animal living in the ocean at the time when it began to change to grassland? Would it be tough for you to live? Why or why not?

Lesson 7: What Killed the Dinosaurs?

Hydroponics - check daily to make sure the area around the seed or tiny plant is moist

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 - Students watch this video [What killed the dinosaurs? | Walking With Dinosaurs | Earth Unplugged](#)

Reason - After students watch this video about how dinosaurs became extinct, they will fill out this [recording sheet](#) as a group or pair. Here is the [teacher answer key](#).

Communicate - Choose one of the theories of why dinosaurs are extinct. Write an opinion piece with reasons

[mystery-science \(3\).pdf](#)

- Mystery Fossils - [mystery-science \(4\).pdf](#)

Lesson 7:

- Video - [What killed the dinosaurs? | Walking With Dinosaurs | Earth Unplugged](#)
- Recording sheet - [recording sheet](#)

and evidence. Use the recording sheet to support this writing.

Lesson 8: Human's Activity

Hydroponics - check daily to make sure the area around the seed or tiny plant is moist. This time measure the lengths and add to the recording sheet from lesson 4.

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/listen to the book "Backyard Bear" by Anne Rockwell ["Backyard Bear"](#)

Reason - Have students jot down the causes and effects human activity has on the environment.

[CauseandEffectTemplate-1.pdf](#)

Communicate - Share cause and effects chart.

Ask students the following questions.

- What did humans do to the environment that the bear lived in?
- What causes the bear to lose his home?
- Why do you think the mother bear ran away?
- How did the environment change over time?

Lesson 9: Habitats

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.

Hydroponics - check daily to make sure the area around the seed or tiny plant is moist.

Gather - [What Is a Habitat? | Science Video for Kids](#)

Reason - Split into groups, groups choose a habitat (artic, desert, forest, freshwater, grasslands, ocean, rainforest) and make a poster/buncee all about their habitat to share with the class. Use the Brainpo jr videos for students to research their habitat. Go to Brainpopjr/science/habitats.

<https://jr.brainpop.com/science/habitats/>

Communicate - Share posters or buncee with their classmates

Lesson 8:

- Book - [Backyard Bear](#) by Anne Rockwell
- [CauseandEffectTemplate-1.pdf](#)

Lesson 9:

- Video - [What Is a Habitat? | Science Video for Kids](#)
- Research video - <https://jr.brainpop.com/science/habitats/>

<p>Lesson 10: Hydroponics revisited 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.</p> <p>Hydroponics - last time - measure the plants and make observations of both types of growing techniques. Ask questions comparing lengths.</p> <p>Gather - students read article on Newsela - “Native community in Alaska grows plants indoors with help from company” https://newsela.com/read/arctic-farming/id/24018/</p> <p>Reason - Prepare for Debate - students choose a side - hydroponics or soil farming. Using the article above they gather evidence and reasons for their opinion. Debate Template</p> <p>Communicate - Debate</p>	<p>Lesson 10:</p> <ul style="list-style-type: none"> • Article - https://newsela.com/read/arctic-farming/id/24018/ • Debate Template
<p>Episode 4 Elaborate/Build New Content/Apply new Content Days: 3 days</p>	
<p>Activity</p>	<p>Resources</p>
<p>How to Save and Endangered Species: Students will choose and research an endangered species through the suggested websites, epic books and newsela. They write up a summary of what we can do to save these animals. Then they will make a diorama of the animal in its habitat. Celebrate by sharing with their community of learners.</p>	<ul style="list-style-type: none"> • Website - https://www.activewild.com/list-of-endangered-animals/ • Epic books • Newsela • Books from the library • Shoebox from home • Materials from home and the classroom to make habitat
<p>Episode 5 Evaluate Days: 1 day</p>	
<p>Assessment</p>	<p>Resources</p>
<p>Endangered Species Presentation rubric</p>	<p>OralPresentationRatingRubricforanysubjectarea-1.pdf</p>
<p>Common Core Curriculum Connections:</p>	

ELA/Literacy –

- RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS4-1),(3-LS4-2),(3-LS4-3) (3-LS4-4)
- RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS4-1),(3-LS4-2),(3-LS4-3),(3LS4-4)
- RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-LS4-1),(3-LS4-2),(3-LS4-3),(3-LS4-4)
- W.3.1 Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-LS4-1),(3-LS4-3),(3-LS4-4)
- W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS4-1),(3-LS4-2),(3-LS4-3),(3-LS4-4)
- W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-LS4-1)
- SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. (3-LS4- 2),(3-LS4-3),(3-LS4-4)

Mathematics –

- 3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. (3-LS4-2),(3-LS4-3)
- 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS4-1)

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Broadcasts		
Models & figures		

Differentiation Strategies

Accommodations	Interventions	Modifications
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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 - From Molecules to Organisms: Structures and Processes	Grade 3	Days - 16
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Standards:

Students who demonstrate understanding can:

3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. [Clarification Statement: Changes organisms go through during their life form a pattern.] [Assessment Boundary: Assessment of plant life cycles is limited to those of flowering plants. Assessment does not include details of human reproduction.]

Anchoring Question:

- How can we use models to describe how organisms have unique and diverse life cycles with birth, growth, reproduction and death in common?

Essential Questions:

1. What is a life cycle?
2. What affects an organism’s life cycle?
3. What parts of a life cycle do all organisms have in common?
4. How are life cycles of plants and animals similar? How are they different?

Enduring Understandings:

- Organisms have unique and diverse life cycles but all have in common birth, growth, reproduction and death

Storyline Narrative / Big Ideas:

Students engage in gathering evidence from readings, videos, and interactive activities to **develop a model** that there are patterns of change that all organisms in their life cycles. Through gathering of information, students are able to determine the four main stages of the life cycle as: BIRTH, GROWTH, REPRODUCTION, and DEATH. Students explore both plant and animal organisms and find similarities in all organisms in the life cycle.

Vocabulary Words: adult, growth, life cycle, parent, plant growth, pollination, predator, shelter, Larva, chrysalis, metamorphosis, system

Science and Engineering Practices	Disciplinary Core Ideas	Cross Cutting Concepts
<p><u>Developing and Using Models</u> Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. Develop models to describe phenomena. (3-LS1-1)</p>	<p>LS1.B: Growth and Development of Organisms: Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.</p>	<p>Patterns - Patterns of change can be used to make predictions. (3-LS1-1)</p>

(3-LS1-1)

Consolidated Supply List:

- caterpillars
- [Butterfly Grow Kit](#),
- Science notebook
- brainpop jr, subscription
- newsela subscription
- epic books - subscription
- Glue sticks
- Markers
- Scissors
- dixie cups
- File folder stickers
- Pipe cleaners
- Cinnamon
- Ground coffee
- Cutting board
- Paper plates
- Toothpicks
- Book - Tadpole to Frog by Wendy Pfeffer

Episode 1
Engage/Elicit Ideas
Days: 2 days

Lessons

Lesson 1: Phenomenon

Gather - Gather students at the carpet or at their seats and show the phenomenon video - [Phenomenon](#). You may have to show it a few times. Have them sketch in their science notebooks what they see. Elicit ideas by asking students what they notice and wonder about the phenomenon.

Reason - Have students write down what they notice and wonder about the phenomenon - [Notice Wonder Catcher.pdf](#).

Communicate - Have students share their thinking and chart it. You may want to have a prepared chart of the big ideas and ask how the video supports some big ideas in the unit. Take a blank piece of paper. Draw a line down the middle. Have them attempt to draw a model of the life cycle of a butterfly on one side. You can use words and drawings to build your model. Label important parts and explain your thinking.

Resources

Lesson 1:

- [Phenomenon](#): Time lapse of monarch butterfly metamorphosis
- [Notice Wonder Catcher.pdf](#).
- Blank piece of paper

<p>Lesson 2: Phenomena Gather - Ask students to look at the image</p> <p>Reason - Students make observations - noticings and wonderings. Notice Wonder Catcher.pdf. (They should recognize that all the plants in the picture are dandelions but at different points in their life cycle.)</p> <p>Communicate - What connections can we make to other video from yesterday about butterflies? Take the piece of paper from yesterday's lesson and attempt to draw a model of the life cycle of a plant on the other side. You can use words and drawings to build your model. Label important parts and explain your thinking. Teachers - save this to revisit throughout the unit.</p>	<p>Lesson 2:</p> <ul style="list-style-type: none"> • Plant image • Notice Wonder Catcher.pdf.
<p>Episode 2 Explore Days: 5 days</p>	
<p>Lessons</p>	<p>Resources</p>
<p>Lesson 3: Butterfly Kit Gather- We will be learning about different life cycles. This unit, we will have a chance to observe a butterfly life cycle. Today, we will set up our butterfly habitat in our classroom.</p> <p>Reason - Class sets up the kit.</p> <p>Communicate - After setting up, have students make an observation of one of the stages of a butterfly. Draw a picture of what they see today. On this template FREEButterflyLifecycle-1.pdf Then revisit and draw the next stages as the students see a change.</p> <p>Lesson 4: Stinky Seeds Mystery Lesson - Anchoring Phenomena with Mystery Science Gather - Tell students that they will look at this mysterious case of how and why some very stinky seeds from a plant are being collected and buried.</p> <p>Reason - During the introduction, students generate observations and questions on this See Think Wonder Sheet about the phenomenon and create an initial conceptual model here System Model to explain how and why they think this is happening.</p>	<p>Lesson 3:</p> <ul style="list-style-type: none"> • caterpillars • Butterfly Kit Instructions • Life cycle template - FREEButterflyLifecycle <p>Lesson 4:</p> <ul style="list-style-type: none"> • Lesson - Anchoring Phenomena with Mystery Science • See Think Wonder Sheet • System Model

Communicate - In the next following exploration tell students you'll explore how plants make seeds and some of the ways that plants change over time. This will help you figure out what is going on with the stinky seeds.

Lesson 5: Why Do Plants Grow Flowers

Mystery Lesson - [Why do plants grow flowers?](#)

Gather - Ask how do you think flowers are pollinated?

Reason - In the activity students will make flower models out of paper and bee models out of pipe cleaners. Students fly their bees from flower to flower and observe what happens to the flower's pollen during this process. Flower template link - [flower template](#)

Communicate - Get Stinky Seed models made in the previous lesson and add to the picture using the questions in the video.

Check on butterflies. Add to model from lesson 3 anything new students see.

Lesson 6: Why do plants give us fruit?

Mystery lesson - [Why do plants give us fruit?](#)

Gather - Ask students how do plants grow fruit?

Reason - Students will examine common grocery produce and predict if each item is a science fruit or science vegetable on this worksheet - [link](#)
Then they take a closer look at slices of the produce and search for seeds.

Communicate - Go back to the "see, think and wonder" sheet to jot down any answers or questions you still have. Go back to the system model to add to the model.

Lesson 7: Are stinky seeds and dung beetles good for each other?

Mystery Lesson - [Anchoring Phenomena with Mystery Science](#)

Gather - Are all life cycles of plants and animals the same? What do you think are some similarities and differences? Go back to the system model one more last time and make changes.

Lesson 5:

- Lesson - [Why do plants grow flowers?](#)
- Glue sticks
- Markers
- Scissors
- dixie cups
- File folder stickers
- Pipe cleaners
- Cinnamon
- Ground coffee
- Flower template link - [flower template](#)

Lesson 6:

- Lesson - [Why do plants give us fruit?](#)
- Cutting board
- Knife
- Celery
- Cucumber
- Paper plates
- Potato
- Radish
- Tomato
- Toothpicks
- Worksheet - [link](#)

Lesson 7:

- Lesson - [Anchoring Phenomena with Mystery Science](#)
- [Questions.](#)
- [Diagrams](#)

<p>Reason - Partners will compare and contrast the life cycles of the dung beetle and the plant that produces the stinky seed. Use the Diagrams and Questions.</p> <p>Communicate - They will then develop their own models of how each life cycle is affected by the other organism. <u>Check on butterflies. Add to model from lesson 3 anything new students see.</u></p>	
<p>Episode 3 Explain Days: 5 days</p>	
<p>Lessons</p>	<p>Resources</p>
<p>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.</p> <p>Reason - partners sort these words in an open sort using their prior knowledge. Label each group of words.</p> <p>Communicate - share how they sorted these words to the class.</p> <p>Lesson 9: Life Cycle of a Frog 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.</p> <p>Gather - Today we are going to work with a partner to discover other life cycles besides plants: Frogs! Teacher reads aloud - Tadpole to Frog - by Wendy Pfeffer https://www.youtube.com/watch?v=V-0vIaSbRQo</p> <p>Discussion Questions:</p> <ol style="list-style-type: none"> 1. What did we learn about some animal life cycles? 2. What were some similarities compared to plant life cycles? 3. What were some differences compared to plant life cycles? <p>Reason - You are going to work with a partner to read more about a frog's life cycle, answer some questions and add to our chart what we've learned about life cycles. Distribute this Readworks article about the frog's life cycle. Encourage partnerships to</p> <ol style="list-style-type: none"> (1) Read it through one time. (2) Read it a second time underlining important 	<p>Lesson 8:</p> <ul style="list-style-type: none"> • Vocabulary words - adult, growth, life cycle, parent, plant growth, pollination, predator, shelter, Larva, chrysalis, metamorphosis, system • Word sort template - BlankWordSortTemplate <p>Lesson 9:</p> <ul style="list-style-type: none"> • Book - Tadpole to Frog by Wendy Pfeffer • Article - article • Life cycle template - Link

information.

(3) Answer the questions collaboratively on the worksheet or in science notebooks.

Communicate - Discussion - What did you learn about Frog life cycles? - Students complete the frog cycle on page 10. [Link](#). Paste in a science notebook. Check on butterflies. Add to model from lesson 3 anything new students see.

Lesson 10: Life Cycle of a Butterfly

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 BrainpopJr. Video on butterflies <https://jr.brainpop.com/science/animals/butterflies/>

Teacher Stops at points throughout the virtual video and asks possible questions:

- How does the butterfly's life begin?
- How does the egg protect itself from predators?
- Can you describe the different stages a butterfly goes through once it hatches?
- What are some things a butterfly does to protect itself from predators?

Reason - Students make a diagram of the life cycle of a butterfly - [link](#), Use vocabulary to label the diagram (Egg → Larva (Caterpillar) → chrysalis → butterfly) Paste into science notebook. With a partner look at both the frog and butterfly life cycle models. How are they similar and/or different Chart responses using a Venn Diagram. [venn.pdf](#)

Communicate - Share venn diagrams with the class.

Lesson 11: Plant Life Cycle Article and Comparisons

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.

Lesson 10:

- Video - Brainpop Jr - <https://jr.brainpop.com/science/animals/butterflies/>
- Life cycle template - [link](#)
- Venn - [venn.pdf](#)

Lesson 11:

- Article - [plant life cycles](#)

<p>Gather - Today, we are going to dig a big deeper into plant life cycles.</p> <p>Reason - Start with an anchoring question: Do you think animal and plant life cycles have any similarities? Why or why not? (Have a short class discussion before introducing the text).</p> <p>Partners read this article about plant life cycles together. They highlight important information about the stages of a plants life cycle</p> <p>Communication - Based on what we've read, sketch a plant life cycle in your science notebook. Reflect: Do you notice any similarities between animal and plant life cycles? Are there any conclusions we can begin to make to this unit question - Quick write in notebooks - How are life cycles of plants and animals similar? How are they different?</p> <p><u>Check on butterflies. Add to model from lesson 3 anything new students see.</u></p>	
<p>Episode 4 Elaborate/Build New Content/Apply new Content Days: 3 days</p>	
<p>Activity</p>	<p>Resources</p>
<p>Research Project - Choose a plant/animal to learn more about. Write an all about either in paper form, technology(buncee, google slides, jamboard) or poster. Include in your all about:</p> <p>Habitat Food Survival methods life cycle model with labels, arrows and explanation Fun facts</p> <p>Some topic ideas: pumpkins, chickens, bald eagles, snakes, bees, fish, reptile (any others you think are appropriate)</p> <p>Students will share their plant/animal with the rest of the class.</p>	<p>Research Sites: brainpop jr, readworks newsela epic books - https://www.getepic.com/app/search</p>
<p>Episode 5 Evaluate Days: 1 day</p>	

Assessment	Resources
<p>During Presentation - Check presentation formats for the Construct/explanation and drawing of a model of the life cycle of their living organisms. Check to see that they Used drawings, words and symbols (like arrows) to show how the organism moves through its life cycle and what is happening at each stage in the life cycle.</p>	

Common Core Curriculum Connections:

- ELA/Literacy –**
- RI.3.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur). (3-LS1-1)
 - SL.3.5 Create engaging audio recordings of stories or poems that demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details. (3-LS1-1)
- Mathematics –**
- 3.NBT Number and Operations in Base Ten (3-LS1-1)
 - 3.NF Number and Operations—Fractions (3-LS1-1)

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		

Differentiated 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 5 : Heredity: Inheritance and Variation of Traits	Grade 3	Days - 12
<p>Standards: Students who demonstrate understanding can: 3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. [Clarification Statement: Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans.] [Assessment Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.]</p> <p>3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment. [Clarification Statement: Examples of the environment affecting a trait could include normally tall plants grown with insufficient water are stunted; and, a pet dog that is given too much food and little exercise may become overweight.]</p>		
<p>Anchoring Question:</p>		
<ul style="list-style-type: none"> ● How do members of a group look similar, but not exactly alike? 		
<p>Essential Questions:</p>		
<ol style="list-style-type: none"> 1. How can we classify animals by groups? (reptiles, amphibians, mammals, insects, birds, fish) 2. What similarities and differences do we notice between animals in the same/ different classifications? 3. How does the environment help change animals over time? 4. How do humans play a role in changing the look of animals over time? 5. What adaptations are useful and not useful for survival? 6. How do animals change over time? 		
<p>Enduring Understandings:</p>		
<ul style="list-style-type: none"> ● Plants and animals have traits inherited from parents and that variation of these traits exist in a group of similar organisms (ex: siblings) ● Traits can be influenced by the environment, humans, or evolution 		
<p>Storyline Narrative / Big Ideas: They will learn that animals in each group have similarities, but organisms have the most similarities to their parents, and parents to their offspring. Students will learn that humans can play a part in evolution over time, by studying how dogs have evolved from wolves, and that there are so many breeds of dogs today. Then, students will learn that the environment can also affect traits of animals over time by looking at species such as the green and brown anoles, peppered moths, giraffes, and different beaks that birds have. Students will learn about Lizard Island, which is a real place populated by green anoles and brown anoles, and they will design a model of a lizard island with modifications to save the green anoles from extinction. Students will also simulate evolution with some colorful “critters” and carnivorous “beaky birds” to demonstrate processes like evolution that take place over many years.</p>		
<p>Vocabulary Words: similarity, species, population, inherit, trait, adaptation, camouflage, defense,</p>		

parent, classification, selection, heredity, hybrid

Science and Engineering Practices	Disciplinary Core Ideas	Cross Cutting Concepts
<p><u>Analyzing and Interpreting Data</u> Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.</p> <p>Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1)</p> <p><u>Constructing Explanations and Designing Solutions</u> Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.</p> <p>Use evidence (e.g., observations, patterns) to support an explanation. (3-LS3-2)</p>	<p>LS3.A: Inheritance of Traits: Many characteristics of organisms are inherited from their parents. (3-LS3-1)</p> <p>Other characteristics result from individuals’ interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3- LS3-2)</p> <p>LS3.B: Variation of Traits: Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)</p> <p>The environment also affects the traits that an organism develops. (3-LS3-2)</p>	<p>Patterns - Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1)</p> <p>Cause and Effect - Cause and effect relationships are routinely identified and used to explain change. (3-LS3-2)</p>

Consolidated Supply List:

- Cardboard box for each group of students
- lizard statues
- pom pom balls
- Crayons
- Cardstock
- Markers
- Qtips
- cotton balls
- pipe cleaners

Episode 1 Engage/Elicit Ideas Days: 1 day	
Lessons	Resources
<p>Lesson 1: Hemmingway's Cats</p> <p>Gather - Watch video - phenomenon. Discuss what they notice about the cat's toes. Ask - how do you think this happens?</p> <p>Reason - Show picture of kittens to the class - Heredity Teacher says - All of the cats in the picture look similar but don't look exactly alike. Have students turn and talk to their partners and make observations.</p> <p><i>Questions to Initiate Class Discussion:</i></p> <p>Q. What is similar about the cats in the picture?</p> <p>Q. Do you think these cats are related? How can you tell?</p> <p>Q. Do any of the cats look like they are not family?</p> <p>Communicate - Students jot down what they think about how members of a group look similar, but not exactly alike.</p>	<p>Lesson 1:</p> <ul style="list-style-type: none"> • Video - phenomenon • Photos - Heredity
Episode 2 Explore Days: 4 days	
Lessons	Resources
<p>Lesson 2: Traits</p> <p>Gather - Read a story about Paint the horse. Paint's Family Tree</p> <p>Reason - Reread the story again about Paint the horse and his family. Give students several copies of the horse template to represent each family member. Students will color in each horse mentioned in the story by the descriptions. Then partners will then look at all the horses in the family colored in and discuss patterns they see about the traits or characteristics they see. Are there any patterns? Horse Template</p> <p>Communicate - Share patterns found with the class. Go back to previous questions from lesson 1 and write down more they have learned about how members of a group look similar, but not exactly alike.</p>	<p>Lesson 2:</p> <ul style="list-style-type: none"> • Paint's Family Tree • Colored pencils or crayons • Horse Template

Lesson 3: What Kinds of Animals will be in the future?
 Mystery Lesson [What kinds of animals might there be in the future?](#)
Gather - What is a cockapoo, labradoodle, etc. (website with many more - [List Of Hybrid Dogs](#))
 Tell students you will learn how people create new breeds of animals by mating (selecting) individuals with desirable traits.
Reason - Students are shown pairs of adult dogs and three potential puppies. They study the physical traits of the dogs and look for the puppy that shares these traits. [Designer Dogs](#)
Communicate - Students complete - [assessment](#)

Lesson 4: How could you make the biggest fruit in the world?
 Mystery lesson - [How could you make the biggest fruit in the world?](#)
Gather - Tell students that Students continue exploring how human beings have modified plants based on our knowledge of how plants inherit their traits.
Reason - In the activity, Odd One Out, students play a game where they guess which fruits are related to each other based on traits of leaves, flowers, and arrangement of seeds. They use this information to understand how humans create fruit varieties by selecting certain traits. [Fruit Cards](#)
[Odd One Out](#)
Communicate - Which two fruits would you combine. Draw a picture and then write the traits of each fruit that would be in your new variety/selection of fruit.

- Lesson 3:**
- Mystery Lesson [What kinds of animals might there be in the future?](#)
 - [List Of Hybrid Dogs](#)
 - [Designer Dogs](#)
 - [assessment](#)

- Lesson 4:**
- **Mystery lesson** - [How could you make the biggest fruit in the world?](#)
 - [Fruit Cards](#)
 - [Odd One Out](#)
 - scissors

Episode 3 Explain Days: 4 days	
Lessons	Resources
Lesson 5:- Vocabulary Splash Gather - display all the unit's vocabulary words on the	Lesson 5: <ul style="list-style-type: none"> • Vocabulary Words - similarity,

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 6: Classifying Animals

Gather - Watch Brainpop Jr video on [Classifying Animals](#)

Reason - Explain sorting game. Assign sorting game from this video. Students sort and then share how they sorted. [sorting game](#)

Communicate - Students share how they sorted the animals by classification.

Additional fun - Assign this website for students to explore: (Creaturepedia section)
<https://pbskids.org/wildkratts/>

Lesson 7: Bat or Bird?

Gather - Read Aloud [Stellaluna](#) by Janell Cannon or https://www.youtube.com/watch?v=q_u1WsN5x6w

Reason - Using a venn diagram, write down the characteristics of both bats and bird. [Venn Diagram](#)

Communicate - Have students write a statement piece about what Stellaluna is - bat or bird? Use evidence from their venn diagram to defend their statement.

Lesson 8: Classify That!

Gather - The teacher will tell students that today they are going to explore imaginary circumstances. Take a look at these animals created by Dr. Seuss in If I Ran the Zoo - What types of animals are these? Students should see traits from many different animals - [Classify That!](#)

Reason - Tell the students that the teacher will read each card (attached) that has descriptions of imaginary animals written out on them. The students will pull out the important information from each card to classify on the venn diagram the newly discovered species into the correct animal classification. Class Venn Diagram -

species, population, inherit, trait, adaptation, camouflage, defense, parent, classification, selection, heredity, hybrid

Lesson 6:

- [Classifying Animals](#)
- Background information about classifications linked [here](#)
- [sorting game](#)

Lesson 7:

- [Stellaluna](#) by Janell Cannon
- [Venn Diagram](#)
- Template

Lesson 8:

- [Classify That!](#)
- [Class Venn Imaginary Animals cards / Triple Venn Diagram of animal classifications](#)

<p>Imaginary Animals cards / Triple Venn Diagram of animal classifications</p> <p>Communicate - Students create their own animal on Buncee using traits from some of their favorite animals. Name the animal and then explain the traits it has.</p>	
<p>Episode 4 Elaborate/Build New Content/Apply new Content Days: 2 days</p>	
<p>Activity</p>	<p>Resources</p>
<p>Lesson 9: Peppered Moths Webquest Gather - Today you are going to use what you learned about natural selection to apply your knowledge of natural selection to a new species of animal -the peppered moths.</p> <p>Reason - Students use their chromebooks to access the peppered moth simulation here:</p> <ul style="list-style-type: none"> • Give students some time to explore the moth simulation game • After students have had ample time to play through the simulation, use the tabs in the simulation to get the answers on this attached webquest record sheet. <p>Communicate - Call on students to share what they learned. Pick a few of the most important questions from the Webquest and have students share their knowledge.</p>	<p>Lesson 9:</p> <ul style="list-style-type: none"> • Peppered Moth Game • Webquest • https://askabiologist.asu.edu/peppered-moths-game/play.html • peppered moth simulation here
<p>Episode 5 Evaluate Days: 1 day</p>	
<p>Assessment</p>	<p>Resources</p>
<p>Use the completed webquest above as the assessment.</p>	<p>webquest</p>
<p>Common Core Curriculum Connections:</p>	
<p>ELA/Literacy –</p> <ul style="list-style-type: none"> • RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS3-1),(3-LS3-2) • RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS3-1),(3-LS3-2) • RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-LS3-1),(3-LS3-2) • W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS3-1),(3-LS3-2) 	

- SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. (3- LS3-1),(3-LS3-2)

Mathematics –

- 3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS3-1),(3-LS3-2)

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		

Differentiated 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 6: Weather (Earth’s Systems and Human Activity)	Grade 3	Days - 16
<p>Standards: Students who demonstrate understanding can: 3-ESS2-1. Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. [Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction.] [Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.]</p> <p>3-ESS2-2. Obtain and combine information to describe climates in different regions of the world.</p> <p>3-ESS3-1. Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.* [Clarification Statement: Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.]</p>		
<p>Anchoring Question:</p>		
<ul style="list-style-type: none"> ● What types of weather can be hazardous and what can we do to protect ourselves from them? 		
<p>Essential Questions:</p>		
<ol style="list-style-type: none"> 1. How can we predict the weather? 2. Does everyone experience the same climate as we? 3. Are there ways we can protect our communities from hazardous weather? 		
<p>Enduring Understandings:</p>		
<ul style="list-style-type: none"> ● We can make observations and record data about the weather to make predictions of the days to come. ● Around the world communities have many different kinds of climates that are different from ours. ● We can use preventable strategies to protect from weather that is predicted. 		
<p>Storyline Narrative / Big Ideas: In this unit we will look at different kinds of weather around the world. We will study the weather conditions like precipitation, wind and temperature to predict weather. We will also research current designs to measure their validity and merit in preventing disastrous results from weather.</p> <p>Weather conditions follow a predictable pattern during specific seasons of the year. Weather has a different pattern in each season. Scientists collect data to predict the typical weather patterns for each season. Students can graph weather data to find climate patterns.</p>		
<p>Vocabulary Words: patterns, area, prediction, precipitation, flow, glacier, surface, volcanic eruption, flood, drought, earthquake, existing, forest fire, hurricane, tornado, tsunami,</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Cross Cutting Concepts

<p><u>Analyzing and Interpreting Data</u> Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1) Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods. Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2)</p> <p><u>Engaging in Argument from Evidence</u> Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-ESS3-1)</p>	<p>ESS2.D: Weather and Climate: Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1) Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)</p> <p>ESS3.B: Natural Hazards: A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1) (Note: This Disciplinary Core Idea is also addressed by 4-ESS3-2.)</p>	<p>Patterns - Patterns of change can be used to make predictions. (3-ESS2-1),(3-ESS2-2)</p> <p>Cause and Effect - Cause and effect relationships are routinely identified, tested, and used to explain change. (3-ESS3-1)</p>
<p>Consolidated Supply List:</p> <ul style="list-style-type: none"> ● Box fan ● Meter stick(s) ● lengths of tape 		

- drinking straws
- 3x5 cards
- popsicle sticks
- tissues
- cardboard
- string
- base-10 blocks
- small rocks
- other simple materials from the classroom
- small clipboard, piece of wood, or white board for students to use as a base for their house model
- Book - [Over in the Wetlands](#) by Caroline Rose
- Subscription to Mystery Science
- Subscription to Epic
- Colored pencils

Episode 1
Engage/Elicit Ideas
Days: 2 days

Lessons

Resources

Lesson 1: Phenomenon

Gather - Show students wind damage done in two different places - picture [Hazardous Weather Phenomenon](#)

Reason - Students write down their observations on a noticings and wonderings chart - [See Think Wonder](#)

Communicate - Class discussion about their noticings and wonderings - *Suggestions for Classroom Discussion:*

- *Focus on cause and effect relationships*
- *What are some steps that people could take to reduce the impacts of these natural hazards?*
- Discuss possible solutions to reduce the effects of weather-related hazards.

Students then write to communicate their solutions to reduce the effects in their student journals.

Lesson 1:

- Picture - [Hazardous Weather Phenomenon](#)
- [See Think Wonder](#)

Episode 2
Explore
Days: 3 days

Lessons

Resources

Lesson 2: Weather Patterns

Gather - Ask students why people in our area typically barbecue outdoors or go camping in the summer rather than winter. Tell students that sometimes unexpected

Lesson 2:

- Data Sheet - [Union County NJ](#)
- [Graph](#)
- Additional Info.

weather sometimes happens such as snow in the summer. "I went on a picnic or camping in June and it began to snow."

Reason - Students look at yearly average temperatures reported on this data sheet - [Union County NJ](#). They will graph the temperatures and Teaching suggestion: Allow kids to turn and talk with partners and as a whole class before having them write their individual responses in their journal [Graph](#)

Communicate - Students write to communicate and explain the patterns of weather that occur in Utah in summer and winter.

Lesson 3: Unusual Weather

Mystery Science - [Anchoring Phenomena](#)

Gather - Ask students - Have you ever seen an icy hailstorm that happens during warm summer weather. Students generate observations and questions about the phenomenon and create an initial explanation of how it happened. [See Think Wonder](#)

Reason - How do you think this happened. Record answers here. [Summer Ice Storm](#)

Communicate - Come up with a way to protect from hailstones. [Hail Protection](#)

Lesson 4: Climates around the world

Mystery Science - [Why are some places always hot?](#)

Gather - Ask students - Is the weather the same all over the world? In Anaheim California the temperature is 85 degrees. Why is the typical temperature between our two cities so different even though it is the same season?

Reason - Students will use Climate Decoder. Students color one part of a world map to figure out the different climates of that region. Students then combine maps and search for global climate patterns. [Climates in the Americas](#), [Climates in Asia and Australia](#), [Climates in Europe and Africa](#)

Communicate - Quick write - What kind of weather, plants, and animals do you think the orange and purple zones have? Why do you think that?

- Weather website - [Union County NJ Climate Averages. Monthly Weather Conditions](#)
- [ClimateCharts.net](#)

Lesson 3:

- Lesson - [Anchoring Phenomena](#)
- [See Think Wonder](#)
- [Hail Protection](#)
- [Summer Ice Storm](#)

Lesson 4:

- Colored pencils
- Lesson - [Why are some places always hot?](#)
- [Climates in the Americas](#)
- [Climates in Asia and Australia](#)
- [Climates in Europe and Africa](#)

Episode 3
Explain
Days: 7 days

Lessons

Lesson 5: 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 6: What is the difference between weather and climate?

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 - Students watch video - [What's the Difference Between Weather and Climate? | NASA](#)

Reason - Students use a t-chart to write down characteristics of both. Weather and Climate. [T-chart](#)

Communicate - Students write in their science journals to communicate their explanation of how weather patterns differ from climate patterns.

Lesson 7: Climates Around the World

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 - What type of climate do you think we live in. Using this website <https://www.climatetypesforkids.com/> find our location on the map. Identify the climate and then learn more about that climate clicking on that link.

Reason - Students locate and label the following cities on the world map on this document - . [Climates](#)

- Panama City, Panama
- Nuuk, Greenland

Resources

Lesson 5:

- Vocabulary - patterns, area, prediction, precipitation, flow, glacier, surface, volcanic eruption, flood, drought, earthquake, existing, forest fire, hurricane, tornado, tsunami

Lesson 6:

- Video - [What's the Difference Between Weather and Climate? | NASA](#)
- [T-chart](#)

Lesson 7:

- Website - <https://www.climatetypesforkids.com/>
- Sheet - [Climates](#)

- Rome, Italy
- Casablanca, Morocco
- Omsk, Russia
- Honolulu, Hawaii
- Sydney, Australia

Students **use data** from the website to predict the probable climate by making a check mark in the correct column.

Communicate - Quick Write - Would you want to travel to any of these cities? Why?

Lesson 8: Hazardous Weather

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- Over in the Wetlands by Caroline Rose - <https://www.youtube.com/watch?v=ymHoYhsyjn0> - Discuss with kids the causes and effects of the hurricane on the swamp community. Create a t-chart on chart paper of the causes/effects - examples - strong wind/bent trees

Reason - Make a list of other hazardous weather. Groups choose to research one of the listed hazardous weather systems. Create a presentation to share with the class all about the system. Students should include in their presentation the causes and effects of these weather systems on communities like ours. Use Epic books for their research - <https://www.getepic.com/app/search>

Communicate - Share their presentations with the class. Students can present using Buncee or Jamboard.

Lesson 8:

- Book - Over in the Wetlands by Caroline Rose
- Website - <https://www.getepic.com/app/search>

Episode 4
Elaborate/Build New Content/Apply new Content
Days: 3 days

Activity

Lesson 9: Design Solution

Students, working in groups of 2-3, **make a design plan** to minimize the effect of a wind storm on a structure then use the Engineering Design Process **to build and test their design.**

Resources

Lesson 9:

- tape
- popsicle stick
- drinking straws
- tissues

1. In your journal, groups write a plan that uses a model for solving the problem of houses being damaged by hurricane winds using the following criteria:

Design Constraints:

- Structure dimensions should be no larger than 5 inches in either length or width. (5 in x 5 in)
- Structures may only be built with the provided materials.
- Plans should explain how the design will solve the problem of hurricane wind damage by withstanding the box fan.
- There is 5-10 minutes for planning and then a 10-15 minute time limit for building.

Students must check off their plan with the teacher before taking materials to build with.

2. Use the plan from your journal to build your house.

3. Test the following and record data about the damage to your house for each. [Design Recording Sheet](#)

- 3 feet away from the fan at 3 different speeds
- 2 feet away from the fan at 3 different speeds.
- 1 foot away from the fan at 3 different speeds

It stays in the wind for 10 seconds, then moves 1 foot closer to the fan. If no damage is done, it should go back to 2 feet but increase the speed of the fan to level Repeat the above steps. If no damage is done, then repeat all with the fan on level 3.

- foam board
- Cardboard
- index cards,
- foil sheets
- Any other materials in their designs
- Provide a sturdy yet movable surface for students to build on such as a clipboard, whiteboard, or other small board.
- [Design Recording Sheet](#)

Students determine if adjustments to their design are necessary. They may check and **redesign** their structures as many times as necessary to minimize the effects of the wind until the time limit is up.

Episode 5
Evaluate
Days: 1 day

Assessment

Resources

Check for Understanding:
[Assessment](#)

Common Core Curriculum Connections:

ELA/Literacy –

- RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-ESS2-2)
- RI.3.9 Compare and contrast the most important points and key details presented in two texts on the same topic. (3-ESS2-2)
- W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-ESS2-2)
- W.3.1 Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-ESS3-1)
- W.3.7 Conduct short research projects that build knowledge about a topic. (3-ESS3-1)

Mathematics –

- 3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (3-ESS2-1)
- 3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in bar graphs. (3-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		

Differentiated 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