BUILT FOR
NGSS USED IN HAWAII

PreK-5 Science
Scope and Sequence

COMPLETE PHENOMENA-BASED
SCIENCE CURRICULUM MADE EASY



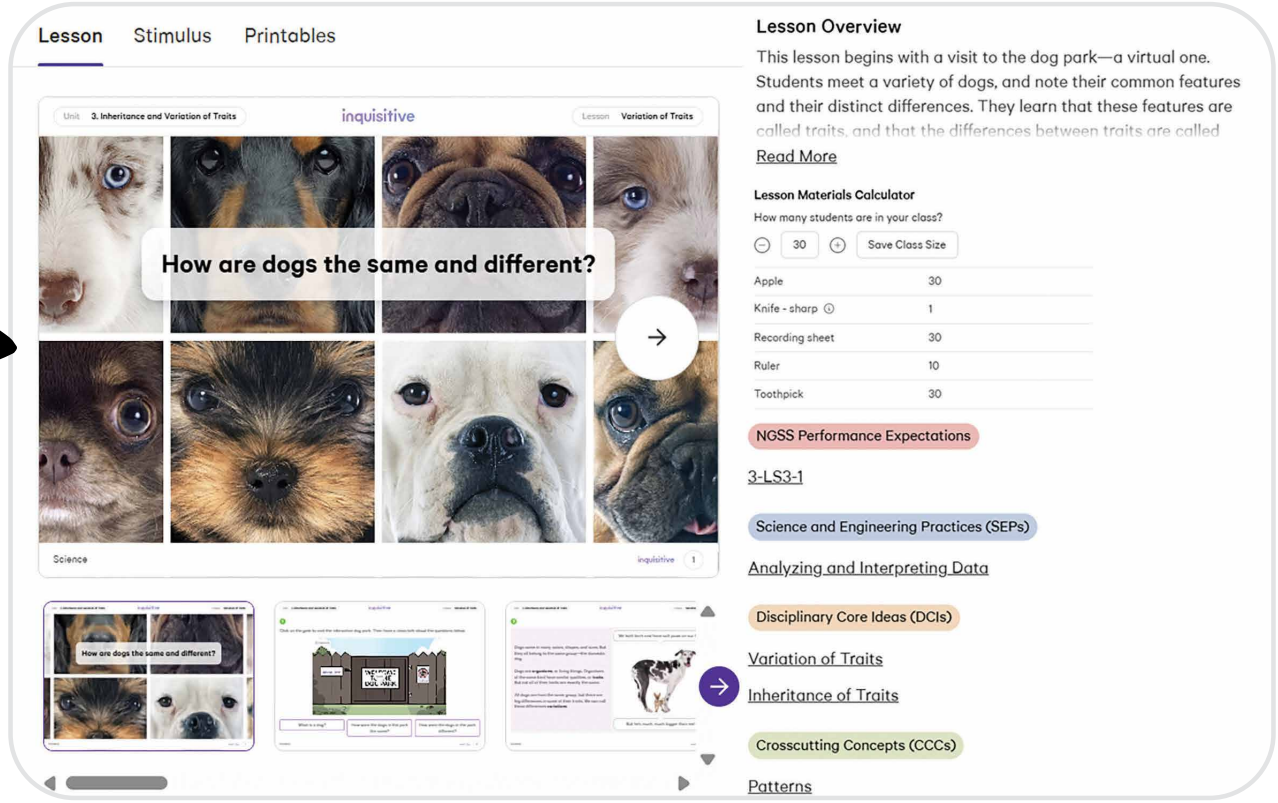
RECOMMENDED
BY OFFICE OF CURRICULUM AND INSTRUCTIONAL DESIGN AS A COMPREHENSIVE INSTRUCTIONAL SCIENCE PROGRAM
RECOMMENDED

- ✓ PHENOMENA-BASED
- ✓ OPEN-AND-GO LESSONS
- ✓ HANDS-ON INVESTIGATIONS
- ✓ AVAILABLE IN 50+ LANGUAGES
- ✓ ASSESSMENTS & PROGRESS MONITORING

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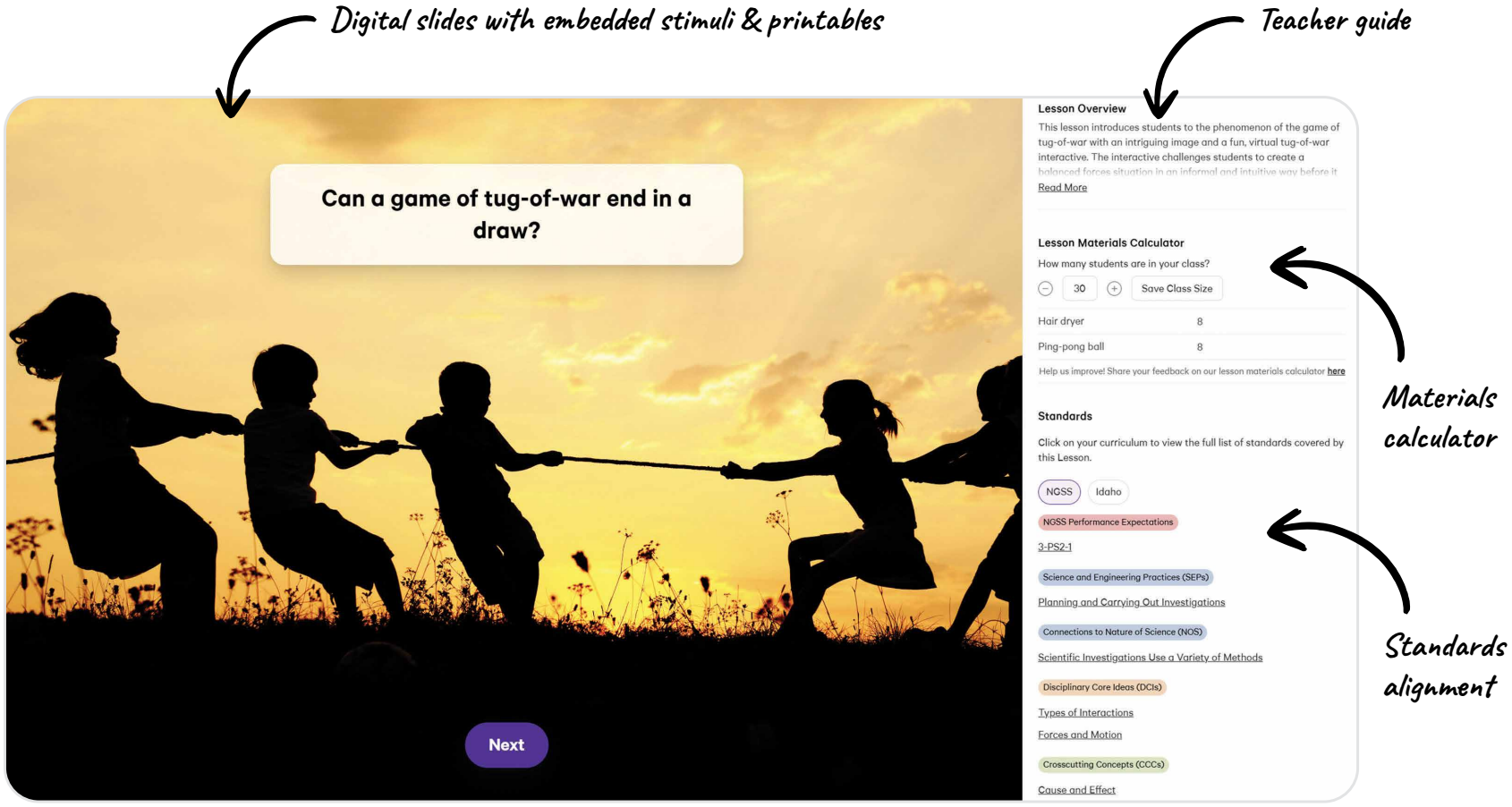
Ready to teach lesson slides

Phenomena-based Learning

Each lesson is anchored in a compelling phenomenon that gives students a meaningful reason to investigate, ask questions, and make sense of the world around them.

Designed for three-dimensional learning, students integrate Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts as they gather evidence, collaborate, develop explanations, and design solutions.

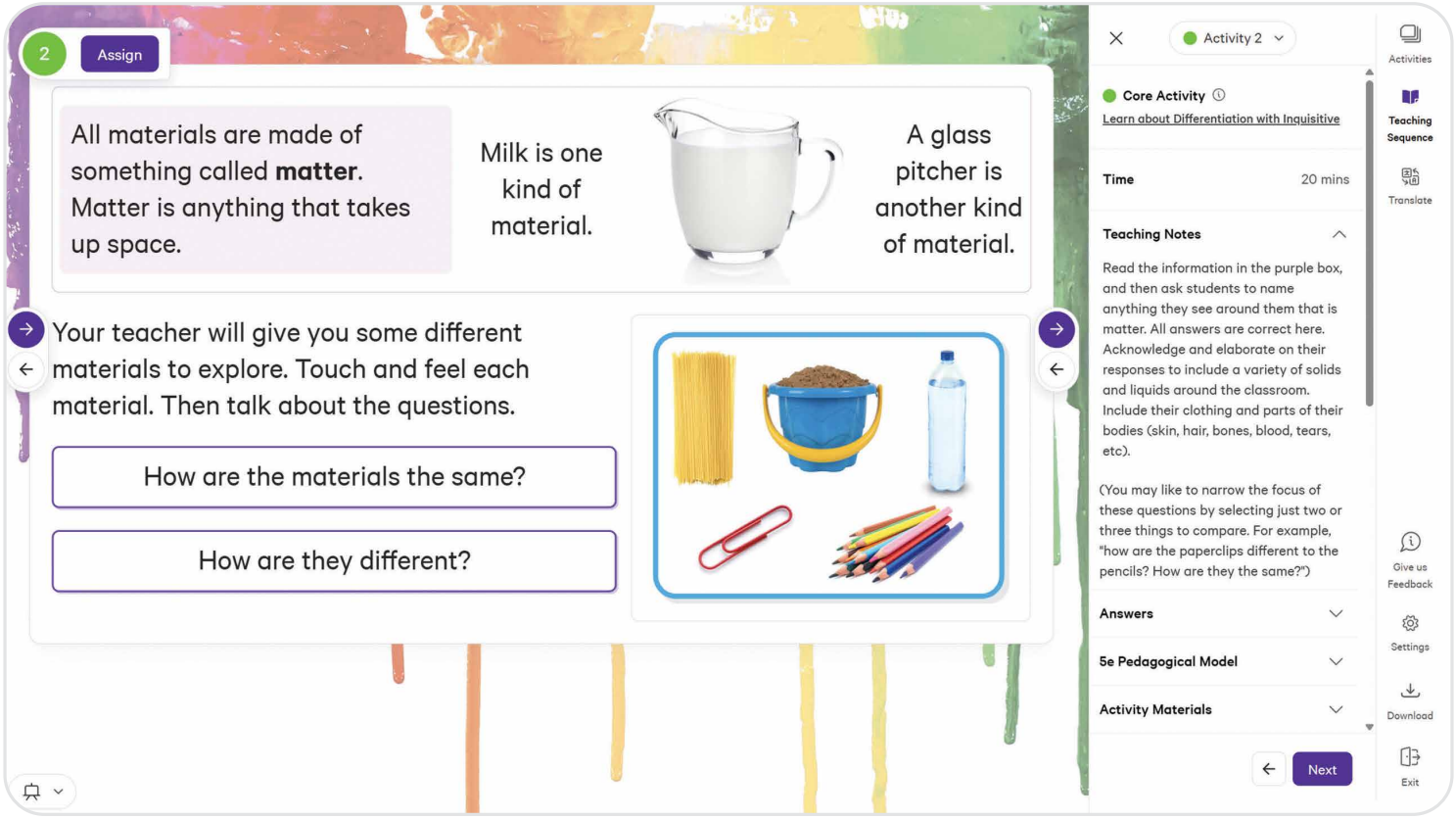
The result is science learning that is rigorous, relevant, and engaging for every learner.



HQIM and Standards-aligned

Inquisitive provides coherent, standards-aligned instruction designed to build knowledge and skills. Comprehensive state-specific crosswalks provide lesson-by-lesson evidence of alignment, while embedded assessments, differentiation strategies, accessibility supports, and research-based instructional practices help every student access grade-level learning.

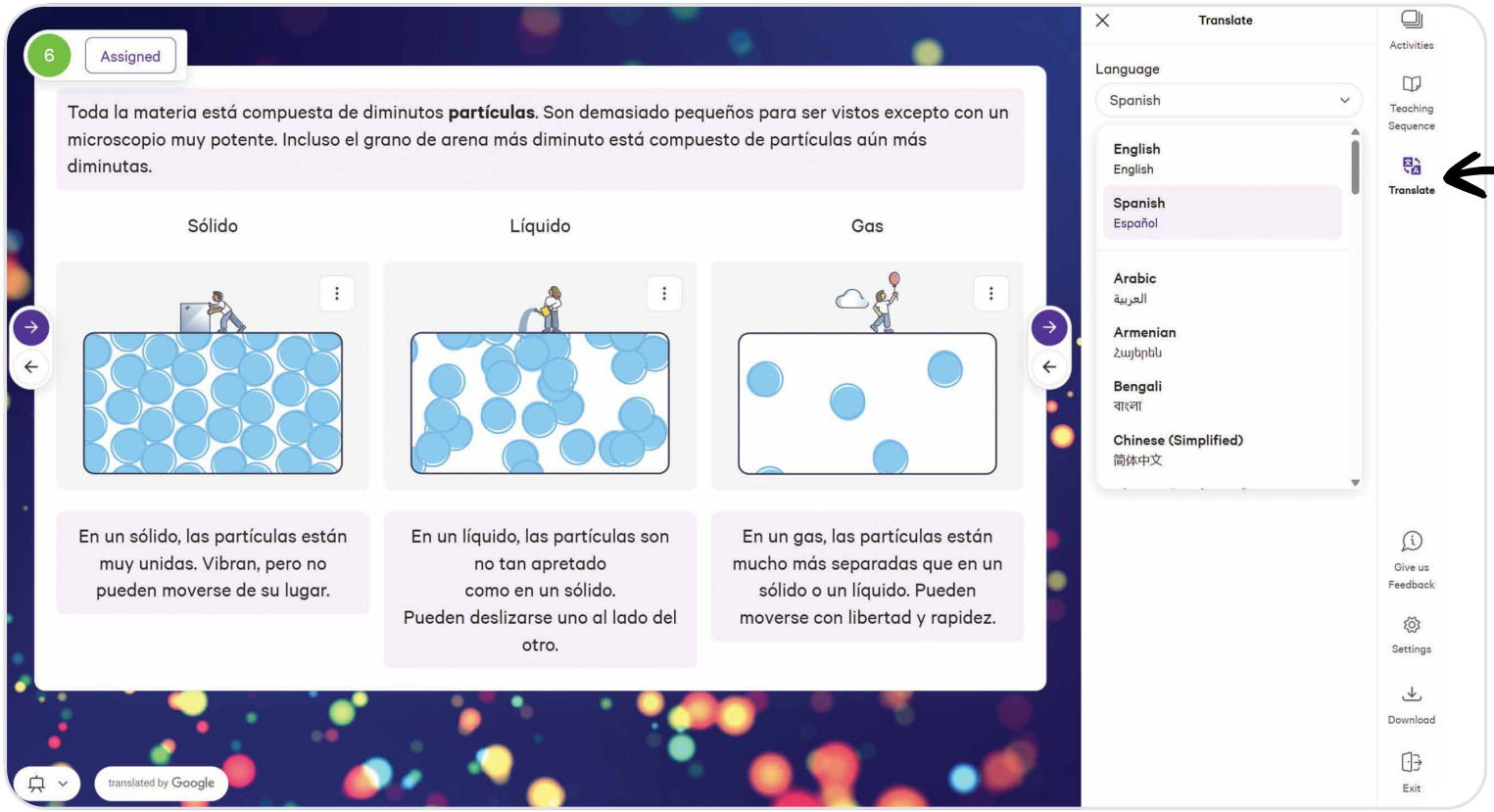
Every lesson includes ready-to-teach digital slides, embedded stimuli, printable resources, teacher guidance, modeled responses, background science, and a materials calculator. Everything teachers need to deliver high-quality science instruction, simply open and go.



Hands-On Science That Builds Sensemaking

Hands-on investigations combine easy-to-source materials with engaging digital interactives, helping teachers spend less time preparing and more time teaching.

Students ask questions, make observations, gather evidence, test ideas, and develop explanations as they make sense of real-world phenomena. They learn science by thinking and acting like scientists and engineers, not simply watching science happen. Optional grade-level kits and refill kits make implementation even easier. Each kit is designed to support a class of up to 30 students.

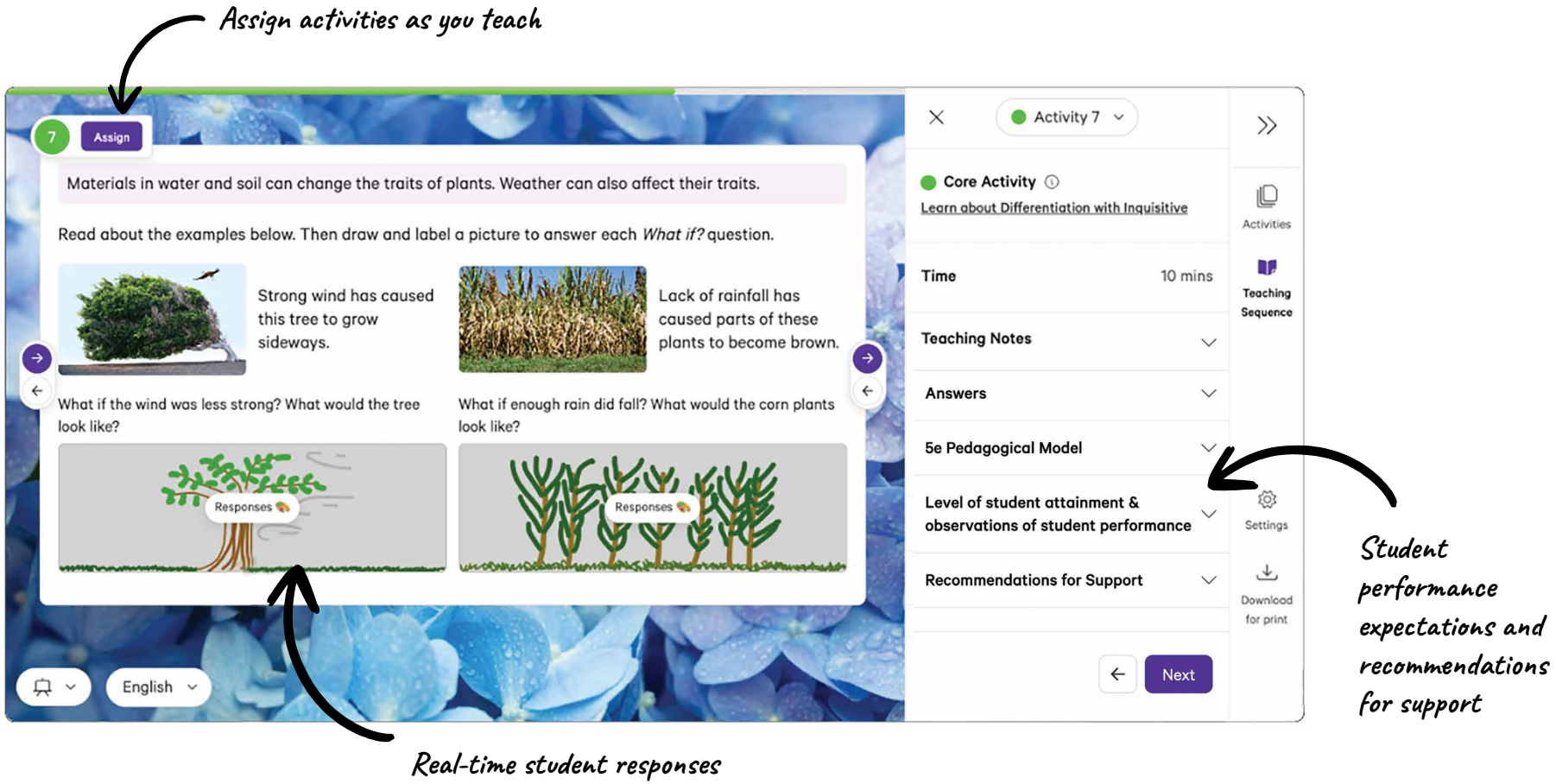


Available in 50+ Languages

Equity, Access, and Differentiation

Built-in scaffolds, differentiation strategies, and culturally responsive content help reduce barriers to rigorous science learning while keeping students engaged in shared phenomena, investigations, and evidence-based thinking.

Language and accessibility supports are embedded directly into lessons, including text-to-speech, assistive technology compatibility, WCAG compliance, and translation into 50+ languages. These integrated supports help more students access grade-level science while giving teachers practical tools to respond to diverse learning needs.

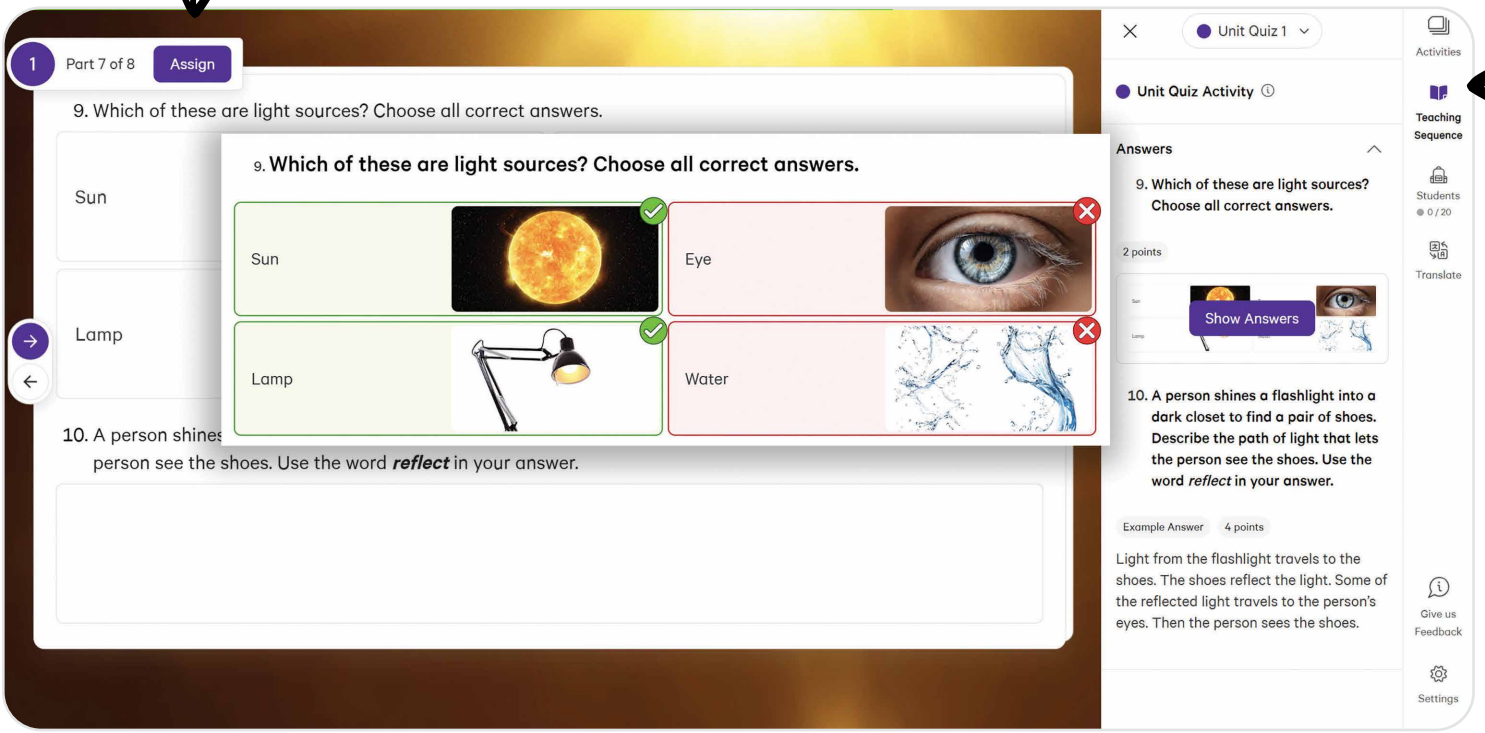


Check for Understanding in Real-Time

Live student responses provide immediate insights into student thinking, enabling teachers to identify misconceptions, adjust instruction, and facilitate meaningful student discussions and collaborations.

For instructional leaders, this means formative data is captured in the moment, supporting evidence-based decisions at the classroom and grade level, not just at the end of a unit.

Assign digitally or print in 50+ languages.



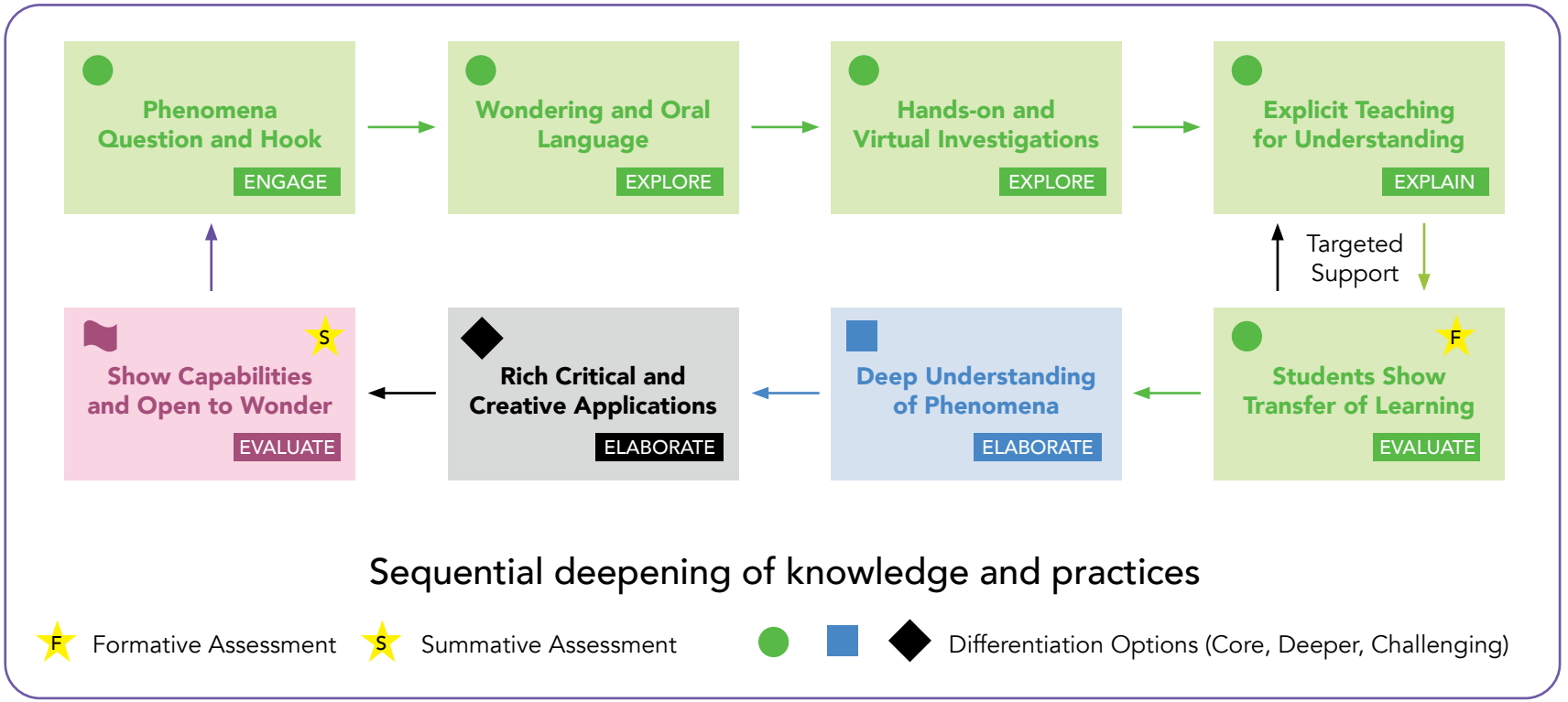
Auto-graded assessment data is displayed in a digital grade book.

Assessment and Standards Mastery

Formative and summative assessments include 3D performance tasks and auto-graded end-of-unit assessments.

Results are summarized in a digital grade book with recommendations for support, giving teachers clear next steps for instruction.

Assessment items are mapped to specific Performance Expectations, so districts can track standards mastery and support MTSS and RTI documentation needs.



Pedagogical Model of Lessons

Every lesson is built around the research-based 5E instructional model, guiding students through engagement, exploration, explanation, elaboration, and evaluation.

High-impact teaching strategies and visible thinking activities support student-centered sensemaking, conceptual understanding, and knowledge transfer while helping all learners access rigorous science learning.

	PreK	K	1	2	3	4	5
PHYSICAL SCIENCE	 **Pushes and Pulls** Explore pushes and pulls	 **Forces and Interactions** Compare strength and direction	 **Waves: Light and Sound** Make sound and light travel	 **Structure of Matter** Describe and change materials	 **Forces and Interactions** Balanced and unbalanced forces	 **Energy** Motion, collisions, and transfer	 **Gravity** Apply force ideas to earth and space
LIFE SCIENCE	 **Living Things** What makes something alive	 **What Living Things Need** Needs of plants and animals	 **Structure and Function** Parts that help survival	 **Interdependent Relationships** Habitats and food	 **Inheritance and Variation** Life cycles and traits	 **Structure and Function** Food energy & cycling through ecosystems	 **Matter and Energy** Internal systems and senses
EARTH & SPACE SCIENCE	 **Weather** Observe local weather	 **Weather and Climate** Describe weather patterns	 **Space Systems** Patterns of the sun, moon, and stars	 **Processes That Shape Earth** Fast and slow land change	 **Weather and Climate** Predict patterns and climate	 **Earth's Changing Surface** Weathering, erosion, and mapping	 **Earth's Systems** Interacting Earth systems

ENGINEERING DESIGN
Engineering design is integrated across all grades as students ask questions, design and test solutions, and use evidence to improve their ideas.

Knowledge Builds Year After Year

Across every discipline, students revisit core science ideas with increasing depth. They move from observing familiar phenomena to investigating patterns, developing models, using evidence, and explaining complex systems.

PreK

LIFE SCIENCE



Living Things

4 lessons



Observing and Sorting Living Things

6 lessons



Home Sweet Home

5 lessons

PHYSICAL SCIENCE



Light and Shadows

4 lessons



Exploring Changes in Objects and Materials

4 lessons



Ready, Set, Move!

4 lessons

EARTH & SPACE SCIENCE



Sky Watchers

4 lessons



Weather

4 lessons

Life Science
Living Things

View Unit Online



Living Things Grow



Living Things Change

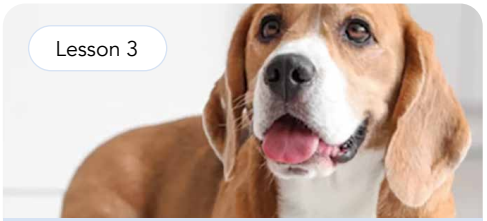
Phenomena & Learning Targets

What makes something a living thing?
- Identify a living thing.
- Describe a living thing as something that grows.

How do living things change as they grow?
- Identify that living things (including humans) change as they grow.

Performance Expectations

PK-LS1-1 Use observations to describe the difference between living and nonliving things and recognize that living things grow and change.



Animals Have Needs



Plants Have Needs

Phenomena & Learning Targets

What do animals need?
- Identify that animals need food, water, and shelter to grow.

What do plants need?
- Identify that plants need sunlight and water to grow.

Performance Expectations

PK-LS1-2 Observe patterns to identify what living things need to survive.

PK-LS1-2 Observe patterns to identify what living things need to survive.

Life Science
Observing and Sorting Living Things

View Unit Online



Body Parts of Animals



Animals on the Move

Phenomena & Learning Targets

What do different animals look like?
- Identify external body parts of animals.
- Describe external body parts of animals.

How do animals move?
- Identify and describe external body parts of animals that help them move.

Performance Expectations

PK-LS1-3 Identify and describe external body parts of animals and how they help them survive.



Animals' Ears



Grouping Animals

Phenomena & Learning Targets

Why do animals have ears?
- Identify ears on different animals.
- Describe what ears do.

How can we group animals?
- Group animals based on their observable features.

Performance Expectations

PK-LS1-3 Identify and describe external body parts of animals and how they help them survive.

PK-LS1-4 Group animals and plants based on their observable features.

Life Science

Home Sweet Home

View Unit Online



Features of Plants

Phenomena & Learning Targets

What different parts of plants can we see?

- Identify and describe external features of plants (leaves, flowers, and stems).

Performance Expectations

PK-LS1-5 Identify and describe external parts of plants.



Wetlands



Forest



Grassland

Phenomena & Learning Targets

How can animals live in the wetlands?

- Identify animals that live in the wetlands.
- Describe features of animals that help them survive in the wetlands habitat.

How can animals live in the forest?

- Identify animals that live in the forest.
- Describe how animals use camouflage to protect themselves.

How can animals live in the grasslands?

- Identify nocturnal behavior and building underground burrows as two ways animals survive in the grasslands.
- Identify animals that live in grasslands.

Performance Expectations

PK-LS1-6 Recognize that living things have different habitats suited to their unique needs.



Grouping Plants

Phenomena & Learning Targets

How can we group plants based on their parts?

- Group plants based on their observable features.

Performance Expectations

PK-LS1-4 Group animals and plants based on their observable features.



Desert



Snowy Mountain Rainforest

Phenomena & Learning Targets

How can animals live in the desert?

- Identify ways animals stay cool in the desert.
- Describe how roadrunners survive in the heat of a desert habitat.

How can animals live in different habitats?

- Identify the reasons a lynx is suited to a snowy mountain forest.
- Identify different habitats that animals live in.
- Explain that animals need the right food, water, and shelter.

Performance Expectations

PK-LS1-6 Recognize that living things have different habitats suited to their unique needs.

Physical Science
Light and Shadows

View Unit Online



Finding Shadows



Blocking Light

Phenomena & Learning Targets

Can we always see our shadow?
- Identify a shadow.
- Understand that we need light to see a shadow.

What makes a good shadow?
- Understand that a shadow is created when light is blocked.
- Identify objects that make a good shadow.

Performance Expectations

PK-PS4-1 Observe and describe changes in shadows by manipulating different objects.



Matching Shadows



Changing Shadows

Phenomena & Learning Targets

Are shadows always the same?
- Identify ways a shadow is similar to the object that makes it.

How might your shadow change without you moving?
- Understand how the position of a light source changes a shadow.
- Make and test predictions about how the position of a light source changes a shadow.

Performance Expectations

PK-PS4-1 Observe and describe changes in shadows by manipulating different objects.

PK-PS4-2 Make and test predictions about the behavior of shadows.

Physical Science
Exploring Changes in Objects and Materials

View Unit Online



Changing Shape



Changing Size

Phenomena & Learning Targets

How can we make something change shape?
- Observe that an object remains the same even though its shape may change.

How can we make something change size?
- Recognize that a single object can be broken into smaller pieces while it remains the same material.

Performance Expectations

PK-PS1-1 Identify and describe changes in objects and materials using their senses.



Hot and Cold



Mix it Up

Phenomena & Learning Targets

How do things change when it warms up or gets cold?
- Describe how adding or removing heat changes how a material looks and feels.

What changes can we make by mixing?
- Observe that mixing substances combines them into a new-looking mixture.

Performance Expectations

PK-PS1-1 Identify and describe changes in objects and materials using their senses.

PK-PS1-2 Plan and conduct an investigation to compare changes in matter when combined with other substances.

Physical Science

Ready, Set, Move!

View Unit Online



Movement and Stillness



Pushing as a Force



Pulling as a Force



Pushing and Pulling in the Playground

Phenomena & Learning Targets

How can we tell if something is moving or still?

- Classify objects and living things as either moving or still based on observable characteristics.

What is a push?

- Identify pushing as a force.
- Demonstrate and compare the effect of applying different levels of force (gentle vs. strong) when pushing objects.

What is a pull?

- Identify pulling as a force.
- Demonstrate and compare the effect of applying different levels of force (gentle vs. strong) when pulling objects.

How do we use pushes and pulls when we play outside?

- Demonstrate their understanding of pushing and pulling in a playground environment.

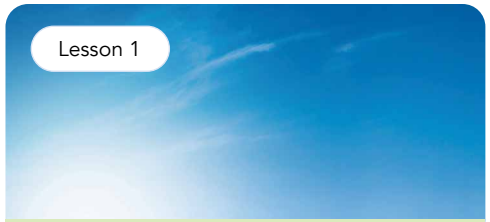
Performance Expectations

PK-PS2-1 Observe and describe the effect of forces on different objects.

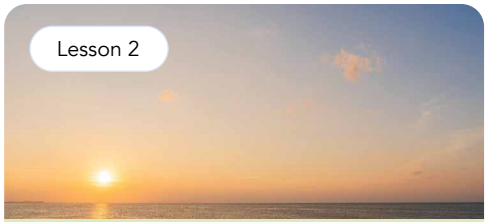
PK-PS2-2 Make and test predictions about how objects start and stop moving and can change direction during play.

Earth and Space Science
Sky Watchers

View Unit Online



Sky Search



The Sun Makes Day and Night

Phenomena & Learning Targets

What can we see in the sky during the day?
- Find and name things in the sky during the day.

How does the Sun help us know when our day starts and when it ends?
- Show how the sun appears to move in a pattern from morning to night.

Performance Expectations

PK-ESS1-1 Observe and describe natural objects in the sky.

PK-ESS1-2 Describe patterns of movement and apparent changes in the sun, moon, and stars to recognize predictable patterns.



Twinkle Twinkle Little Star



Moon Shapes

Phenomena & Learning Targets

What pictures can we find when we join the stars in the night sky?
- Observe that stars form fixed patterns in the sky and use their imagination to create "star pictures."

How does the moon's shape appear to change in a pattern?
- Identify that the moon's lit-up shape appears to change over time into different recognizable shapes.

Performance Expectations

PK-ESS1-2 Describe patterns of movement and apparent changes in the sun, moon, and stars to recognize predictable patterns.

Earth & Space Science
Weather

View Unit Online



Talking About the Weather



Picture the Weather

Phenomena & Learning Targets

What is the weather like now?
- Identify types of weather.
- Use their senses to describe what the weather is like today.

How can we show the weather with a picture?
- Choose a picture that shows today's weather.

Performance Expectations

PK-ESS2-1 Observe and describe changes in the weather.

PK-ESS2-3 Collect and record data on weather patterns to recognize how local weather changes daily.



Weather Wear



Animals and Plants Changing with the Weather

Phenomena & Learning Targets

What should we wear today?
- Identify appropriate clothes to wear for the weather outside.

What happens to plants and animals in different types of weather?
- Identify what happens to plants and animals in different types of weather.

Performance Expectations

PK-ESS2-2 Identify examples of the effects of changes in weather and season on their own lives.

Kindergarten

LIFE SCIENCE



Interdependent Relationships in Ecosystems

Where do plants and animals live and why do they live there?

5 lessons + assessment

PHYSICAL SCIENCE



Forces and Interactions: Pushes and Pulls

What happens if you push or pull an object?

4 lessons + assessment

EARTH AND SPACE SCIENCE



Weather and Climate

How does weather change and why do we need to know about it?

5 lessons + assessment

ENGINEERING DESIGN



Build Me a House

Why is the shape of something important?

2 lessons + assessment

Life Science

Interdependent Relationships in Ecosystems

View Unit Online

Anchor Question: Where do plants and animals live and why do they live there?



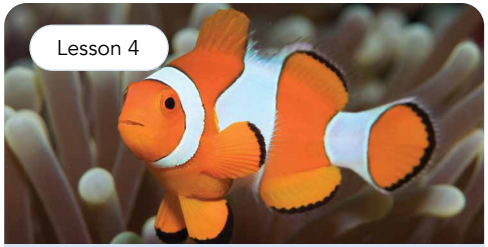
Staying Alive!



What Do Plants Need?



Change, Change, Change!



This is Home

Phenomena & Learning Targets

Do all animals need water?

- Identify living things and nonliving things.
- State that animals need food and water to survive.
- Describe the foods that different animals eat.

What keeps plants alive?

- Identify the needs of plants to live and grow.

What does a weaverbird weave?

- Give an example of a living thing changing its environment and explain how and why it is doing so.
- Use evidence (in images) to decide whether an animal or plant is changing its environment.

Why do fish live in the sea?

- Describe the relationships between living things, the resources they need to survive, and where they live.
- Use a model to describe how the needs of living things are met by the places in which they live and the resources found in those places.

Performance Expectations

K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.

K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.

K-ESS2-2 Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

K-ESS3-1 Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.

Science & Engineering Practices

Analyzing and Interpreting Data

Analyzing and Interpreting Data

Engaging in Argument from Evidence

Developing and Using Models

Disciplinary Core Ideas

LS1.C Organization for Matter and Energy Flow in Organisms

LS1.C Organization for Matter and Energy Flow in Organisms

ESS2.E: Biogeology
ESS3.C: Human Impacts on Earth Systems

ESS3.A: Natural Resources

Crosscutting Concepts

Patterns

Patterns

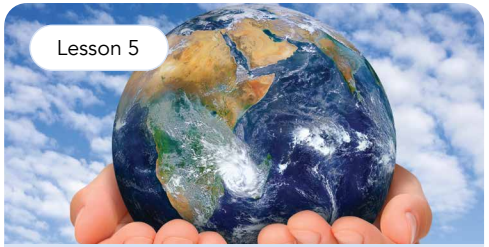
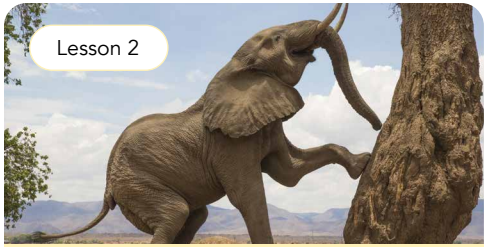
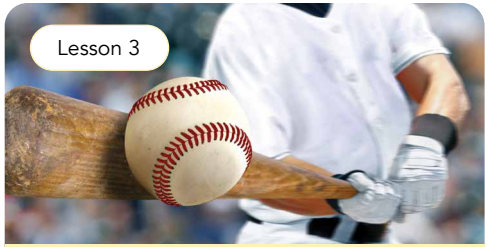
Systems and System Models

Systems and System Models

Physical Science
Forces and Interactions: Pushes and Pulls

View Unit Online

Anchor Question: What happens if you push or pull an object?

Lesson 5	Lesson 1	Lesson 2	Lesson 3
			
Helping Earth	**Push and Pull**	**Speed it Up! Slow it Down!**	**Which Way?**
Phenomena & Learning Targets			
Does our trash harm Earth? • Describe how people affect the land, water, air, and other living things in the local environment • Communicate solutions that will reduce the impact of humans.	**How do you make a funny face?** • Understand that pushes and pulls are used to start and stop the motion of objects. • Identify and classify pushes and pulls.	**Can an elephant move a tree?** • Demonstrate how pushes and pulls of different strengths can cause the speed of objects to change.	**How does a ball move?** • Demonstrate how pushes and pulls can cause the direction of objects to change. • Explain that when objects collide, objects will move in different directions.
Performance Expectations			
K-ESS3-3 Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.	**K-PS2-1** Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.	**K-PS2-1** Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.	**K-PS2-1** Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
Science & Engineering Practices			
Obtaining, Evaluating, and Communication Information	Planning and Carrying out investigations	Planning and Carrying out investigations	Planning and Carrying Out Investigations
Disciplinary Core Ideas			
ESS3.C: Human Impacts on Earth Systems ETS1.B: Developing Possible Solutions	PS2.A: Forces and Motion	PS2.A: Forces and Motion PS3.C: Relationship Between Energy and Forces	PS2.A: Forces and Motion PS2.B: Types of Interactions
Crosscutting Concepts			
Cause and Effect	Cause and Effect	Cause and Effect	Cause and Effect

Earth and Space Science

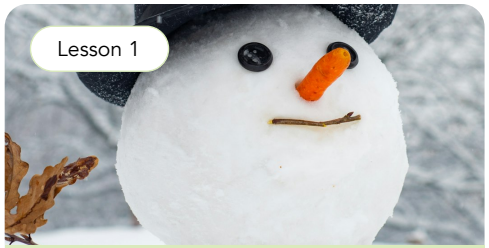
Weather and Climate

View Unit Online

Anchor Question: What is the weather and how does weather affect us?



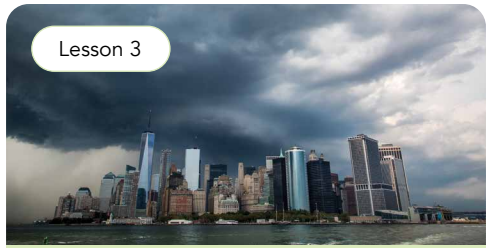
Does it work?



What is Weather?



Watching the Weather



Weather Warning!

Phenomena & Learning Targets

Can you move a toy without touching it?

- Understand that there are several ways to solve a problem.
- Analyze data from a design solution and draw a conclusion.
- Explain how changing the force acting on an object changes the speed of its motion.

What's the weather like today?

- Observe the current local weather.
- Describe the weather as a combination of different conditions at a particular time.

How does the weather change?

- Recognize the symbols used to depict weather.
- Understand that the weather changes daily.
- Record weather over time and look for patterns.

What is severe weather?

- Ask questions about severe weather in their local area.
- Describe how people plan and prepare for severe weather.

Performance Expectations

K-PS2-2 Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.

K-ESS2-1 Use and share observations of local weather conditions to describe patterns over time.

K-ESS2-1 Use and share observations of local weather conditions to describe patterns over time.

K-ESS3-2 Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.

Science & Engineering Practices

Analyzing and Interpreting Data

Analyzing and Interpreting Data

Analyzing and Interpreting Data

Asking Questions and Defining Problems
Obtaining, Evaluating, & Communicating Info

Disciplinary Core Ideas

ETS1.A: Defining and Delimiting Engineering Problems
PS2.A: Forces and Motion

ESS2.D: Weather and Climate

ESS2.D: Weather and Climate

ESS3.B: Natural Hazards
ETS1.A: Defining and Delimiting Engineering Problems

Crosscutting Concepts

Cause and Effect

Patterns

Patterns

Cause and Effect

Engineering Design
Build Me a House

View Unit Online

Anchor Question: Why is the shape of something important?



Sunlight Warms Earth

Phenomena & Learning Targets

What happens when the sun shines?

- Describe the warming effect of the sun on Earth's surface.

What can we do when it's too sunny?

- Explain negative effects from too much sunlight and heat.
- Plan, design, and build a structure to provide shade and protection from the sun's light and heat.

Performance Expectations

K-PS3-1 Make observations to determine the effect of sunlight on Earth's surface.

K-PS3-2 Use tools and materials provided to design and build a structure that will reduce the warming effect of sunlight on an area.

Science & Engineering Practices

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Disciplinary Core Ideas

PS3.B: Conservation of Energy and Energy Transfer

PS3.B: Conservation of Energy and Energy Transfer

Crosscutting Concepts

Cause and Effect

Cause and Effect



Shelter from the Sun



What is a House?

Phenomena & Learning Targets

What should a house do?

- Identify that a house is designed to protect us from heat, cold, wind and rain.
- Explore and consider the different materials used to build houses.
- Generate a design of a "dream" house.

What type of house can't be blown down by a wolf?

- Develop a simple model of a house.
- Test and evaluate their model.
- Understand the importance of the materials used in helping the shape and stability of a structure.

Performance Expectations

K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

Science & Engineering Practices

Asking Questions and Defining Problems

Developing and Using Models

Disciplinary Core Ideas

ETS1.A: Defining and Delimiting Engineering Problems

ETS1.B: Developing Possible Solutions

Crosscutting Concepts

N/A

Structure and Function



I'll Huff and I'll Puff!

Grade 1

LIFE SCIENCE



Structure, Function, and Information Processing

How do external parts and behaviors help animals and plants survive and grow? Are young plants and animals exactly like their parents?

8 lessons + assessment

PHYSICAL SCIENCE



Waves: Light and Sound

What happens when things vibrate? What happens when there is no light?

7 lessons + assessment

EARTH AND SPACE SCIENCE



Space Systems: Patterns and Cycles

What objects are in the sky and how do they seem to move?

4 lessons + assessment

ENGINEERING DESIGN



Farm to Family

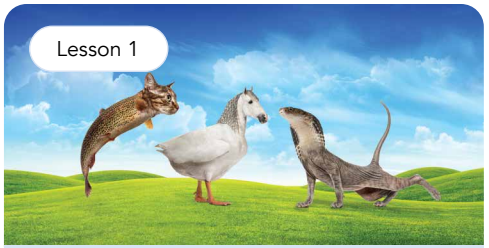
How can we protect living things?

3 lessons + assessment

Life Science
Structure, Function, and Information Processing

Anchor Question: How do plants and animals survive and grow?

View Unit Online



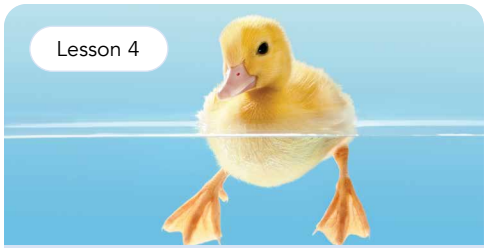
How Useful!



Plant Parts



Scaredy Cat!



Mimic Nature

Phenomena & Learning Targets

Can we name an animal by its body parts?

- Identify that animals use their body parts in different ways.
- Identify that animals use their body parts to survive and grow.

What makes a plant a plant?

- Identify that plants have different external structures (parts).
- Identify that plants use these external structures to survive and grow.

What do different sounds make you do?

- Identify that animals have body parts that capture and convey different kinds of information needed for growth and survival.
- Identify that animals respond to these stimuli with behaviors that help them survive.
- Identify that plants also respond to some external stimuli.

Could you swim better if you had duck feet?

- Identify that plants and animals use their body parts to survive and grow.
- Use materials to design a solution to a human problem that mimics how plants or animals use their external parts.
- Recognize the shape and stability of structures of natural and designed objects relate to their function.

Performance Expectations

1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Science & Engineering Practices

N/A

N/A

N/A

Constructing Explanations and Designing Solutions

Disciplinary Core Ideas

LS1.A: Structure and Function

LS1.A: Structure and Function

LS1.D: Information Processing

LS1.A: Structure and Function
LS1.D: Information Processing

Crosscutting Concepts

Structure and Function

Structure and Function

Structure and Function

Structure and Function



Offspring



Are We Alike?



Plants Have Parents Too



Same but Different

Phenomena & Learning Targets

How do parents help their babies survive?

- Identify behaviors of parents and offspring that help the offspring survive.
- Read grade-appropriate texts and use media to obtain scientific information.
- Determine patterns in the natural world.

How do babies look like their parents?

- Explain that young animals are very much, but not exactly like, their parents.

Do plants have moms and dads?

- Determine that young plants are similar but different from the adult version of the same plant.

Do all tigers look the same?

- Explain that types of plants or animals are recognizable as similar but can also vary in many ways.

Performance Expectations

1-LS1-2 Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.

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

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Science & Engineering Practices

Obtaining, Evaluating, and Communicating Information

Constructing Explanations and Designing Solutions

Constructing Explanations and Designing Solutions

Constructing Explanations and Designing Solutions

Disciplinary Core Ideas

LS1.B: Growth and Development of Organisms

LS3.A: Inheritance of Traits

LS3.A: Inheritance of Traits

LS3.B: Variation of Traits

Crosscutting Concepts

Patterns

Patterns

Patterns

Patterns

Physical Science
Waves: Light and Sound

View Unit Online

Anchor Question: How can I make sound? What happens when there is no light?



Good Vibrations



Move to the Sound



Sound Signals



Turn on the Light!

Phenomena & Learning Targets

How can you make sound?

- Identify what happens when materials vibrate.
- Investigate materials and their relationship with sound.
- Determine that vibrating materials make sound.

Can sound make things move?

- Identify what happens to materials when sound is played.
- Investigate sound and its relationship to materials
- Determine that sound can make materials vibrate.

Can we use sound to send a message?

- Identify that devices allow us to communicate.
- Design and build a device that uses sound to communicate.
- Determine communication means to send and receive.

What do we need to be able to see?

- Identify that light can cause objects to be seen.
- Investigate what happens when objects are illuminated.
- Determine that some objects give off their own light and others can be seen if light is available.

Performance Expectations

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

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

1-PS4-4 Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.

1-PS4-2 Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated.

Science & Engineering Practices

Planning and Carrying Out Investigations

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Constructing Explanations and Designing Solutions

Disciplinary Core Ideas

PS4.A: Wave Properties

PS4.A: Wave Properties

PS4.C: Information Technologies and Instrumentation

PS4.B: Electromagnetic Radiation

Crosscutting Concepts

Cause and Effect

Cause and Effect

N/A

Cause and Effect



Beam of Light



Mirror Mirror



Light Signals

Phenomena & Learning Targets

What happens when we shine a light on an object?

- Identify that a beam of light shines in one direction.
- Investigate what affects a beam of light has on objects made from different materials.
- Determine that some objects allow all light to pass through, some allow a portion of the light to pass through, and some block light and create shadows.

Can light bounce?

- Identify a beam of light can reflect off objects.
- Investigate what effects a beam of light has on objects made from different materials.
- Determine that some objects allow light to bounce off them and light their surrounding space.

Can we use light to send a message?

- Identify what devices allow us to communicate using light.
- Design and build a device that uses light to communicate.
- Determine communication means to send and receive information using light.

Performance Expectations

1-PS4-3 Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light.

1-PS4-3 Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light.

1-PS4-4 Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.

Science & Engineering Practices

Planning and Carrying Out Investigations

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Disciplinary Core Ideas

PS4.B: Electromagnetic Radiation

PS4.B: Electromagnetic Radiation

PS4.C: Information Technologies and Instrumentation

Crosscutting Concepts

Cause and Effect

Cause and Effect

N/A

inquisitive

Earth and Space Science

Space Systems: Patterns and Cycles

View Unit Online

Anchor Question: What objects can I see in the sky?

Lesson 1	Lesson 2	Lesson 3	Lesson 4
			
The Sun is Out	**Bright Moon**	**Starry, Starry Night**	**Daylight and Nighttime**
Phenomena & Learning Targets			
Is the sun always in the same place in the sky? • Identify that when the sun appears in the sky, it is daylight. • Observe, describe, and predict the pattern of motion of the sun as it appears in the sky.	**When can we see the moon?** • Identify that the moon appears brighter when it is nighttime. • Identify that the moon can appear at different times during the day and night. • Observe and describe that the moon's position in the sky appears to move.	**How do we see stars?** • Understand that the appearance of stars in the sky can be observed and predicted. • Identify that stars (other than our own sun) are visible at night but not during the day.	**Why go to bed when it's not dark?** • Identify there is more daylight in summer. • Identify there is more nighttime in winter.
Performance Expectations			
1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted.	**1-ESS1-1** Use observations of the sun, moon, and stars to describe patterns that can be predicted.	**1-ESS1-1** Use observations of the sun, moon, and stars to describe patterns that can be predicted.	**1-ESS1-2** Make observations at different times of year to relate the amount of daylight to the time of year.
Science & Engineering Practices			
Analyzing and Interpreting Data	Analyzing and Interpreting Data	Analyzing and Interpreting Data	Planning and Carrying Out Investigations
Disciplinary Core Ideas			
ESS1.A: The Universe and Its Stars	ESS1.A: The Universe and Its Stars	ESS1.A: The Universe and Its Stars	ESS1.B: Earth and the Solar System
Crosscutting Concepts			
Patterns	Patterns	Patterns	Patterns

Engineering Design
Farm to Family

View Unit Online

Anchor Question: How can we protect living things?



Food, Glorious Food



In the Making



It's in the Design

Phenomena & Learning Targets

Where does your food come from?

- Recognize that plants and animals can be used as food.

Where do your clothes come from?

- Identify items engineered and produced from fibers sourced from plants and animals.

What can we make to protect an animal?

- Identify a need or problem which needs a solution
- Develop and evaluate a simple design solution to the problem.

Performance Expectations

K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

Science & Engineering Practices

Asking Questions and Defining Problems

Asking Questions and Defining Problems

Developing and Using Models

Disciplinary Core Ideas

ETS1.A: Defining and Delimiting Engineering Problems

ETS1.A: Defining and Delimiting Engineering Problems

ETS1.B: Developing Possible Solutions

Crosscutting Concepts

N/A

N/A

Structure and Function

Grade 2

LIFE SCIENCE



Interdependent Relationships in Ecosystems

Why do living things need a habitat?

4 lessons + assessment

PHYSICAL SCIENCE



Structure and Properties of Matter

How are materials similar and different from one another, and how do the properties of the materials relate to their use?

5 lessons + assessment

EARTH AND SPACE SCIENCE



Earth's Systems: Processes that Shape the Earth

How does land change and what are some things that cause it to change?

5 lessons + assessment

ENGINEERING DESIGN



Test Kitchen

How can we keep our food safe to eat?

4 lessons + assessment

Life Science

Interdependent Relationships in Ecosystems

View Unit Online

Anchor Question: How do living things help each other?



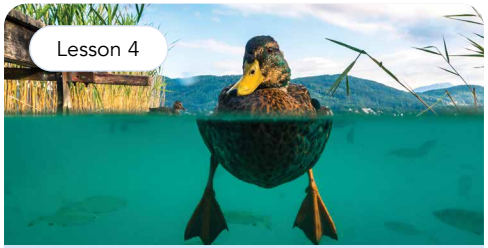
Growing Plants



Animal Helpers



Unbeelievable Bees!



Whose Habitat is This?

Phenomena & Learning Targets

How big can a plant be?

- Plan and conduct an investigation.
- Collect and interpret data about plant growth.
- Understand that plants need water and sunlight to grow.

How do seeds move around?

- Understand that animals help to spread seeds from plants.
- Develop a simple model to demonstrate how animals help spread seeds.

How do bees help plants?

- Understand that animals help spread pollen from one plant to another.
- Use a simple model to demonstrate how bees help spread pollen.

Where do we find living things?

- Identify and describe different habitats.
- Describe living things in a certain habitat.
- Compare the different plants and animals that live in a certain habitat.

Performance Expectations

2-LS2-1 Plan and conduct an investigation to determine if plants need sunlight and water to grow.

2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.

Science & Engineering Practices

Planning and Carrying Out Investigations

Developing and Using Models

Developing and Using Models

Planning and Carrying Out Investigations

Disciplinary Core Ideas

LS2.A: Interdependent Relationships in Ecosystems

ETS1.B: Developing Possible Solutions
LS2.A: Interdependent Relationships in Ecosystems

ETS1.B: Developing Possible Solutions
LS2.A: Interdependent Relationships in Ecosystems

LS4.D: Biodiversity and Humans

Crosscutting Concepts

Cause and Effect

Structure and Function

Structure and Function

N/A

Physical Science

Structure and Properties of Matter

View Unit Online

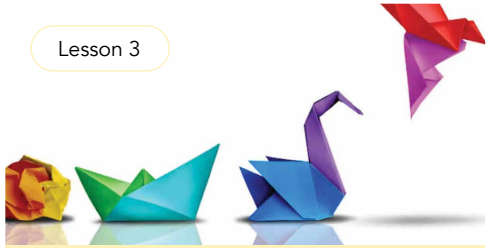
Anchor Question: How are objects described and how do objects change?



What IS This Stuff?



Sorting Our Stuff



The Best Material for the Job



Building New Things from Parts

Phenomena & Learning Targets

What's the difference between a solid and a liquid?

- Understand that matter is all of the substances we can see and feel.
- Investigate the differences between solids and liquids.
- Understand that solids keep their shape while liquids take the shape of their container.

How can we sort things?

- Explain that matter has properties.
- Classify matter by its properties.
- Observe that the properties of matter can change when heated or cooled.

Why is paper the best material for origami?

- Explain how different materials have properties that make them suited for different purposes.

Can you make a new object from old parts?

- Identify that objects are made from parts.
- Explain that an object can be disassembled into parts and these parts can be reassembled to make something new.

Performance Expectations

2-PS1-1 Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

2-PS1-1 Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

2-PS1-2 Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

2-PS1-3 Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.

Science & Engineering Practices

Planning and Carrying Out Investigations

Planning and Carrying Out Investigations

Analyzing and Interpreting Data

Constructing Explanations and Designing Solutions

Disciplinary Core Ideas

PS1.A: Structure and Properties of Matter

PS1.A: Structure and Properties of Matter

PS1.A: Structure and Properties of Matter

PS1.A: Structure and Properties of Matter

Crosscutting Concepts

Patterns

Patterns

Cause and Effect

Energy and Matter

Earth and Space Science

Earth's Systems: Processes that Shape the Earth

Anchor Question: How does the Earth change over time? View Unit Online



Changes from Heating and Cooling



Earth Changes S-l-o-w-l-y



Earth Changes Fast!



Water, Water Everywhere!

Phenomena & Learning Targets

How does heating and cooling change matter?

- Explain that heating and cooling can change matter.
- Compare and contrast changes that can be undone and cannot be undone.

How can a huge mountain become a small rock?

- Understand that elements and features on Earth (dirt, sand, rocks, hills, mountains, rivers, lakes, and seas) change over time.
- Recognize that weathering and erosion are slow changes that transform Earth's surface over a long period of time.

What happens when a volcano erupts?

- Understand that elements and features on Earth (soil, sand, rocks, hills, mountains, rivers, lakes, and seas) change over time.
- Recognize that volcanic eruptions, earthquakes, and floods are examples of changes that happen quickly and transform Earth's surface suddenly.

Where on Earth is all the water?

- Identify where water is found on Earth.
- Understand that water can be found in liquid or solid (ice) form.

Performance Expectations

2-PS1-4 Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

2-ESS1-1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

2-ESS1-1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

2-ESS2-3 Obtain information to identify where water is found on Earth and that it can be solid or liquid.

Science & Engineering Practices

Engaging in Argument from Evidence

Constructing Explanations and Designing Solutions

Constructing Explanations and Designing Solutions

Obtaining, Evaluating, and Communicating Information

Disciplinary Core Ideas

PS1.B: Chemical Reactions

ESS1.C: The History of Planet Earth

ESS1.C: The History of Planet Earth

ESS2.C: The Roles of Water in Earth's Surface Processes

Crosscutting Concepts

Cause and Effect

Stability and Change

Stability and Change

Patterns

Lesson 4



The Power of Wind and Water

Lesson 5



Map It!

Phenomena & Learning Targets

Can wind and water change the land?

- Understand that sudden and slow changes caused by wind and water can change the shape of the land.
- Examine and discuss solutions that engineers and scientists have designed to prevent this damage from happening.
- Compare solutions designed to slow or prevent wind or water from changing the shape of the land.

Can we show land and water in different ways?

- Develop a model that identifies natural landforms and bodies of water.
- Understand that maps can be used to represent many types of areas.

Performance Expectations

2-ESS2-1 Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

2-ESS2-2 Develop a model to represent the shapes and kinds of land and bodies of water in an area.

Science & Engineering Practices

Constructing Explanations and Designing Solutions

Developing and Using Models

Disciplinary Core Ideas

ESS2.A: Earth Materials and Systems
ETS1.C: Optimizing the Design Solution

ESS2.B: Plate Tectonics and Large-Scale System Interactions

Crosscutting Concepts

Stability and Change

Patterns

Engineering Design
Test Kitchen

View Unit Online

Anchor Question: How can we keep food safe to eat?



Kitchen Nightmares



No Rotten Apples



Useful or Not?



Make it Last

Phenomena & Learning Targets

Why does some food need to be kept cold?

- Understand that food needs to be stored and handled correctly to keep it safe to eat.
- Follow the procedure for making a cooler and identify the engineering design involved.

Would you eat a rotten apple?

- Identify that there is a process for handling and storing food safely.
- Find out how to make a cut apple last longer.

Which kitchen gadgets are useful?

- Identify a problem that can be solved.
- Generate and develop a design for a new kitchen gadget.
- Compare the design of their kitchen gadget with other designs.

Which kitchen gadgets are useful?

- Understand that cotton and wool are natural fibers.
- Conduct an investigation to find out which sauce stain is the most difficult to remove.
- Understand that engineering design is used to develop stain resistant clothes.

Performance Expectations

K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

K-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Science & Engineering Practices

Developing and Using Models

Asking Questions and Defining Problems

Developing and Using Models

Analyzing and Interpreting Data

Disciplinary Core Ideas

ETS1.B: Developing Possible Solutions

ETS1.A: Defining and Delimiting Engineering Problems

ETS1.B: Developing Possible Solutions

ETS1.C: Optimizing the Design Solution

Crosscutting Concepts

Structure and Function

N/A

Structure and Function

N/A

Grade 3

LIFE SCIENCE



Interdependent Relationships In Ecosystems

What happens to living things when their environment changes?

5 lessons + assessment

LIFE SCIENCE



Inheritance and Variation of Traits

What are the life cycles of plants and animals, and how do their traits vary?

6 lessons + assessment

PHYSICAL SCIENCE



Forces and Interactions

What makes things move or stay still?

8 lessons + assessment

EARTH AND SPACE SCIENCE



Weather and Climate

How do we measure and prepare for different types of weather?

4 lessons + assessment

ENGINEERING DESIGN



Forces

How can we use forces in a product or system?

3 lessons + assessment

Life Science

Interdependent Relationships in Ecosystems

View Unit Online

Anchor Question: How do living things survive where they live?



Animal Groups



Group Work



Fossil Stories



Happy In My Habitat

Phenomena & Learning Targets

What kinds of animals live in groups?

- Identify animals that live in or form groups.
- Understand that some animals form large groups and that others live in small groups.
- Give an example of an animal that lives in a large group and an animal that lives in a small group.

Why do flocks of birds swoop and swirl together?

- Construct an argument with evidence that animals form groups for different reasons.
- Understand that being part of a group helps animals survive.

What kinds of stories lie buried in rock?

- Describe what a fossil is.
- Give a simple explanation of how fossils are formed.
- Give an example of the type of information we get from a fossil.
- Explain how the locations of fossils inform about environment changes over time.

Why can some turtles grow grass on their shell?

- Describe what a habitat is and give some examples of different habitats.
- Describe the features an animal has that enable it to survive in its habitat.
- Explain why an animal could not live in a different habitat.

Performance Expectations

3-LS2-1 Construct an argument that some animals form groups that help members survive.

3-LS2-1 Construct an argument that some animals form groups that help members survive.

3-LS4-1 Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

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.

Science & Engineering Practices

Engaging in Argument from Evidence

Engaging in Argument from Evidence

Analyzing and Interpreting Data

Engaging in Argument from Evidence

Disciplinary Core Ideas

LS2.D: Social Interactions and Group Behavior

LS2.D: Social Interactions and Group Behavior

LS4.A: Evidence of Common Ancestry and Diversity

LS4.C: Adaptation

Crosscutting Concepts

Cause and Effect

Cause and Effect

Scale, Proportion, and Quantity

Cause and Effect

Life Science
Inheritance and Variation of Traits

View Unit Online

Anchor Question: How do living things vary in their traits?



What Happens When Environments Change?

Why are turtles eating plastic bags?

- Describe some of the ways that environments can change.
- Describe how changes to an environment can affect the organisms that live there.
- Evaluate the effectiveness of a solution designed to solve a problem caused by changes to an environment.

Performance Expectations

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.

Science & Engineering Practices

Engaging in Argument from Evidence

Disciplinary Core Ideas

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

Crosscutting Concepts

Systems and System Models



Plant Life - From Seed to Seed

Why do apple trees grow apples?

- Produce an informative model that shows the key stages in the life cycle of a plant.

Performance Expectations

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.

Science & Engineering Practices

Developing and Using Models

Develop and/or use models to describe and/or predict phenomena.

Disciplinary Core Ideas

LS1.B: Growth and Development of Organisms

Crosscutting Concepts

Patterns



Animal Life Cycles

What happens after an animal is born?

- Produce an informative model that shows the key stages in the life cycle of a chosen animal.

Performance Expectations

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.

Science & Engineering Practices

Developing and Using Models

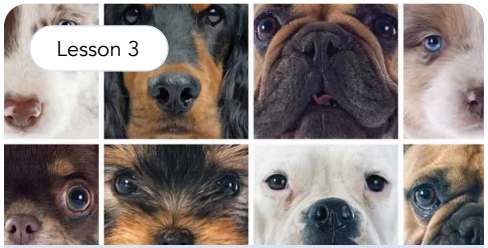
Develop and/or use models to describe and/or predict phenomena.

Disciplinary Core Ideas

LS1.B: Growth and Development of Organisms

Crosscutting Concepts

Patterns



Variation of Traits

How are dogs the same and different?

- Analyze and interpret data to provide evidence of the shared traits and variations in traits that occur in a species.

Performance Expectations

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.

Science & Engineering Practices

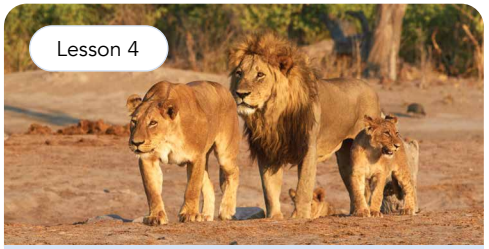
Analyzing and Interpreting Data

Disciplinary Core Ideas

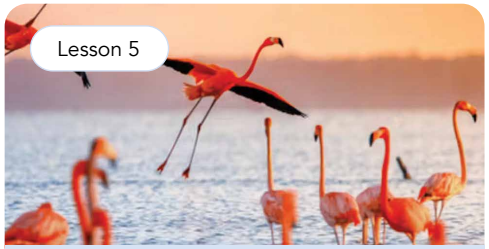
LS3.A: Inheritance of Traits
Many characteristics of organisms are inherited from their parents.
LS3.B: Variation of Traits Different organisms vary in how they look and function because they have different inherited information.

Crosscutting Concepts

Patterns



Inherited Traits



Can the Environment Affect Traits?



What's My Advantage?

Phenomena & Learning Targets

In what ways are offspring like their parents?

- Identify and use evidence to support the idea that offspring inherit traits from their parents.
- Identify and use evidence to support the idea that siblings with the same parents will have variations in their traits.

Why are flamingos pink?

- Identify and use evidence to support the idea that the environment of a living thing can affect both its physical and behavioral traits.

How can an animal's color help it survive?

- Use evidence to construct an explanation for why a variation in a trait gives certain individuals in a species a survival advantage.

Performance Expectations

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.

3-LS3-2 Use evidence to support the explanation that traits can be influenced by the environment.

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.

Science & Engineering Practices

Analyzing and Interpreting Data

Constructing Explanations and Designing Solutions

Constructing Explanations and Designing Solutions

Disciplinary Core Ideas

LS3.A: Inheritance of Traits

LS3.A: Inheritance of Traits
LS3.B: Variation of Traits

LS4.B: Natural Selection

Crosscutting Concepts

Patterns

Cause and Effect

Cause and Effect

Physical Science
Forces and Interactions

View Unit Online

Anchor Question: What makes things move?



Move It!



Falling With Style!



Balancing Forces



Forceful Friction

Phenomena & Learning Targets

How can a dog ride a skateboard?

- Identify a force as a push or a pull.
- Use arrows to represent the magnitude and direction of a force.

How can you skydive safely?

- Describe the forces of gravity and air resistance.
- Use arrows to accurately represent gravity and air resistance in a specific situation.
- Explain how the shape of an object affects the amount of air resistance it experiences.

Can a game of tug-of-war end in a draw?

- Identify when the forces on an object are balanced or unbalanced.
- Explain how balanced and unbalanced forces affect an object's motion.
- Use arrows to represent balanced and unbalanced forces.

Can sledding on grass be fun?

- Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
- Describe and represent how friction affects the motion of an object.
- Use force concepts, including friction, to explain experimental observations.

Performance Expectations

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.

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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.

Science & Engineering Practices

Planning and Carrying Out Investigations

Planning and Carrying Out Investigations

Planning and Carrying Out Investigations

Planning and Carrying Out Investigations

Disciplinary Core Ideas

PS2.A: Forces and Motion
PS2.B: Types of Interactions

PS2.A: Forces and Motion

PS2.A: Forces and Motion
PS2.B: Types of Interactions

PS2.A: Forces and Motion
PS2.B: Types of Interactions

Crosscutting Concepts

Cause and Effect

Cause and Effect

Cause and Effect

Cause and Effect



Patterns In Motion



Hair Raising!



It's Magnetic!



What's The Problem?

Phenomena & Learning Targets

Can we predict how an amusement park ride will move?

- Identify patterns in motion and use these patterns to predict future motion.
- Make observations and measurements to produce data that serves as the basis for evidence for an explanation of an observed phenomenon.

Can an object start moving all by itself?

- Identify electrostatic force as a non-contact force.
- Describe the interaction between two charged objects in terms of a cause and effect relationship.

What force can push and pull from a distance?

- Identify when a magnetic force is at work and what types of materials are magnetic.
- Describe the interaction between two magnetic objects in terms of a cause and effect relationship.

Can we use magnets to solve a problem?

- Identify and define a problem that can be solved using magnets.
- Use their knowledge of magnets and magnetic force to design a solution to the problem.

Performance Expectations

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.

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.

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.

3-PS2-4 Define a simple design problem that can be solved by applying scientific ideas about magnets.

Science & Engineering Practices

Planning and Carrying Out Investigations

Asking Questions and Defining Problems

Asking Questions and Defining Problems

Asking Questions and Defining Problems

Disciplinary Core Ideas

PS2.A: Forces and Motion

PS2.B: Types of Interactions

PS2.B: Types of Interactions

PS2.B: Types of Interactions

Crosscutting Concepts

Patterns

Cause and Effect

Cause and Effect

N/A

Earth and Space Science
Weather and Climate

View Unit Online

Anchor Question: How does weather and climate affect the way we live?



Weather Watching



Weather Patterns and Predictions



What's Your Climate?



Weatherproof!

Phenomena & Learning Targets

What can weather maps tell us?

- Understand how weather data is collected and represented.
- Can represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

Why do you need to know about the weather?

- Identify weather patterns across different times and areas.
- Make predictions about the weather.

How can our mood be like the weather?

- Obtain and combine information to explain that climate refers to weather patterns in a particular region over time.
- Describe climates in different regions of the world.
- Identify how patterns can be used to make predictions.

What can we do to prepare for extreme weather?

- Recognize types of extreme weather.
- Make a claim about a solution that reduces the impact of a weather-related hazard.
- Identify and use evidence to support a claim.

Performance Expectations

3-ESS2-1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

3-ESS2-1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

3-ESS2-2 Obtain and combine information to describe climates in different regions of the world.

3-ESS3-1 Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

Science & Engineering Practices

Analyzing and Interpreting Data

Analyzing and Interpreting Data

Obtaining, Evaluating, and Communicating Information

Engaging in Argument from Evidence

Disciplinary Core Ideas

ESS2.D: Weather and Climate

ESS2.D: Weather and Climate

ESS2.D: Weather and Climate

ESS3.B: Natural Hazards

Crosscutting Concepts

Patterns

Patterns

Patterns

Cause and Effect

Engineering Design
Forces

View Unit Online

Anchor Question: How can we use forces in a product or system?



Let's Build Bridges

Phenomena & Learning Targets

How can we design a bridge that won't fall down?

- Understand that the design process is important in generating safe products.
- Work collaboratively to generate and compare multiple solutions to a problem.
- Recognize that engineers improve existing technologies when designing new products.

Performance Expectations

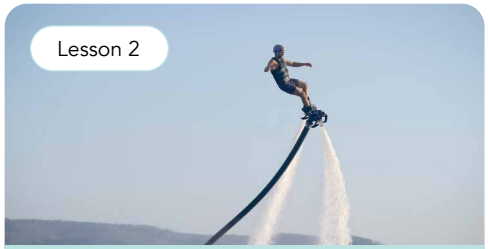
3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Science & Engineering Practices

Constructing Explanations and Designing Solutions

Disciplinary Core Ideas

ETS1.B: Developing Possible Solutions



Making Forces Work

Phenomena & Learning Targets

How can we hover?

- Identify and define a design problem that can be solved through the development of an object.
- Recognize that the success of a designed solution is determined by considering the desired features of a solution.

Performance Expectations

3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

Science & Engineering Practices

Asking Questions and Defining Problems

Disciplinary Core Ideas

ETS1.A: Defining and Delimiting Engineering Problems



Make Me Move

Phenomena & Learning Targets

Can we make something that uses force to move?

- Recognizing that they should research a problem before beginning to design a solution.
- Identifying that testing a solution involves investigating how well it performs.
- Understanding that communicating with peers about proposed solutions is an important part of the design process.

Performance Expectations

3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Science & Engineering Practices

Planning and Carrying Out Investigations

Disciplinary Core Ideas

ETS1.B: Developing Possible Solutions

Grade 4

LIFE SCIENCE	PHYSICAL SCIENCE	PHYSICAL SCIENCE	EARTH AND SPACE SCIENCE	ENGINEERING DESIGN
				
Structure, Function, and Information Processing	**Energy**	**Waves**	**Earth's Systems: Processes that Shape the Earth**	**Helping Nature**
How do internal and external structures support the survival, growth, behavior, and reproduction of plants and animals?	*How can energy be transformed and changed?*	*How do waves demonstrate patterns and transmit information?*	*How do natural processes shape the Earth?*	*How can we design and generate products to help plants and animals?*
5 lessons + assessment	7 lessons + assessment	4 lessons + assessment	5 lessons + assessment	3 lessons + assessment

Life Science

Structure, Function, and Information Processing

Anchor Question: How do plant and animal structures help them survive? View Unit Online



Plantific!



Survivors!



The Inside Story!



Sensing Information

Phenomena & Learning Targets

How can vegetables be the same and different?

- Identify important external structures of a plant and describe their function.
- Identify an important internal structure of a plant and describe its function.
- Understand that plant structures work together as a connected system.

What helps animals survive?

- Identify different external structures of a variety of animals.
- Explain how an external structure helps an animal to survive.

What is under an animal's skin?

- Identify position and function of the heart, lungs, and brain in their body.
- Explain how these structures, along with the nerves, work together to aid growth and survival.
- Give examples of animals that have internal structures similar to and different from those in humans.

What does a service dog do?

- Describe the senses as the ways in which an animal's brain receives information about the environment.
- Use a model to identify each stage in the sequence of events, that begins with a change in an animal's environment, and ends with the brain directing the body to respond.

Performance Expectations

4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

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4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

4-LS1-2 Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

Science & Engineering Practices

Engaging in Argument from Evidence

Engaging in Argument from Evidence

Engaging in Argument from Evidence

Developing and Using Models

Disciplinary Core Ideas

LS1.A: Structure and Function

LS1.A: Structure and Function

LS1.A: Structure and Function

LS1.D: Information Processing

Crosscutting Concepts

Systems and System Models

Systems and System Models

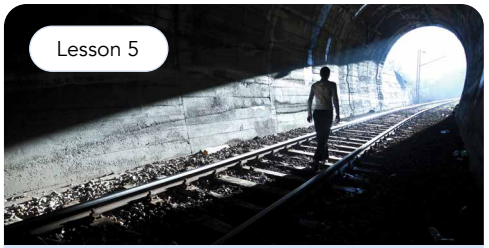
Systems and System Models

Systems and System Models

Physical Science
Unit 1: Energy

View Unit Online

Anchor Question: What is energy and how is it transferred?



Eye, Eye!



Fast Energy



When Objects Collide



Sound Moves

Phenomena & Learning Targets

Why do we see things?

- State that light travels in straight lines called rays.
- Explain that we see objects when light rays reflect off them and into our eyes.
- Describe how mirrors change the path of light and help us to see things we cannot look at directly.

Would you ride a roller coaster?

- Identify that moving objects have energy.
- Use evidence to construct an argument that the faster an object moves, the more energy it possesses.

How does a Rube Goldberg machine work?

- Ask questions and predict outcomes regarding changes in energy when objects collide.
- Demonstrate energy is transferred from objects that collide which also changes the motion
- Explain colliding objects transfer some energy to the air producing heat and light.

Why are sounds different?

- Explain how sound is produced
- State that sound travels from one place to another, and cite practical observations as evidence.

Performance Expectations

4-PS4-2 Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.

4-PS3-1 Use evidence to construct an explanation relating the speed of an object to the energy of that object.

4-PS3-3 Ask questions and predict outcomes about the changes in energy that occur when objects collide.

4-PS3-2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

Science & Engineering Practices

Developing and Using Models

Constructing Explanations and Designing Solutions

Asking Questions and Defining Problems

Planning and Carrying Out Investigations

Disciplinary Core Ideas

PS4.B: Electromagnetic Radiation

Constructing Explanations and Designing Solutions

PS3.A: Definitions of Energy
PS3.B: Conservation of Energy / Energy Transfer
PS3.C: Relationship - Energy and Forces

PS3.A: Definitions of Energy
PS3.B: Conservation of Energy and Energy Transfer

Crosscutting Concepts

Cause and Effect

Energy and Matter

Energy and Matter

Energy and Matter



Heat Moves



Switch on the Light



Converting Energy



Energy Resources

Phenomena & Learning Targets

Does heat move?

- Identify that energy comes in different forms, including heat.
- Make observations to provide evidence that energy can be transferred from place to place.
- Understand that energy can be transferred from one form to another.

When we click a switch, why does a light turn on?

- Describe how light energy travels from one place to another.
- Describe how to build a circuit that changes electrical energy into light energy.

How can wind power help charge a cell phone?

- Identify that energy can be transformed or changed from one form to another.
- Demonstrate that electrical energy can be transformed into motion, sound, light or heat energy.

What gives us energy?

- Explain the difference between a renewable and a nonrenewable energy resource.
- Describe the effects of a particular energy resource on the environment.

Performance Expectations

4-PS3-2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

4-PS3-2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

4-PS3-4 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another

4-ESS3-1 Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

Science & Engineering Practices

Planning and Carrying Out Investigations

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Obtaining, Evaluating, and Communicating Information

Disciplinary Core Ideas

PS3.A: Definitions of Energy
PS3.B: Conservation of Energy and Energy Transfer

PS3.A: Definitions of Energy PS3.B: Conservation of Energy / Energy Transfer
PS3.C: Relationship - Energy and Forces

ETS1.A: Defining Engineering Problems
PS3.B: Conservation & Transfer of Energy
PS3.D: Energy in Chemical Processes

ESS3.A: Natural Resources

Crosscutting Concepts

Energy and Matter

Energy and Matter

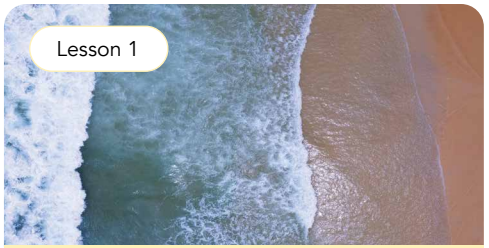
Energy and Matter
Connections to Engineering

Energy and Matter
Connections to Engineering

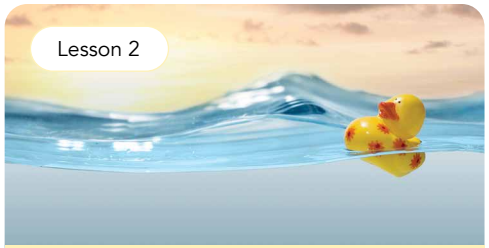
Physical Science
Unit 2: Waves

View Unit Online

Anchor Question: What are waves and what can they do?



Catch The Wave



Modeling Waves



Sending Information



Get the Message

Phenomena & Learning Targets

How are waves formed?

- Describe wave patterns found in nature.
- Describe differences in wave patterns in terms of their wavelength and amplitude.

What can waves do?

- Use a physical model to observe and analyze the natural phenomenon of wave motion.
- Develop a model to explain that waves can cause objects to move.

How did people send messages before cell phones?

- Use a code to send and receive messages.
- Compare the effectiveness of different methods for sending and receiving encoded messages.
- Appreciate how today's technology is far more effective and efficient at sending and receiving information than a hundred years ago.

What was the Arecibo message?

- Send and receive simple messages using a visual form of binary code.
- Understand that binary code is used by modern communication technologies to send and receive information.

Performance Expectations

4-PS4-1 Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.

4-PS4-1 Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.

4-PS4-3 Generate and compare multiple solutions that use patterns to transfer information.

4-PS4-3 Generate and compare multiple solutions that use patterns to transfer information.

Science & Engineering Practices

Developing and Using Models

Developing and Using Models

Constructing Explanations and Designing Solutions

Constructing Explanations and Designing Solutions

Disciplinary Core Ideas

PS4.A: Wave Properties

PS4.A: Wave Properties

PS4.C: Information Technologies and Instrumentation. ETS1.C: Optimizing the Design Solution.

PS4.C: Information Technologies and Instrumentation. ETS1.C: Optimizing the Design Solution.

Crosscutting Concepts

Patterns

Patterns

Patterns

Patterns

Earth and Space Science

Earth's Systems: Processes that Shape the Earth

Anchor Question: How does the Earth change over time?

View Unit Online



Has Earth Changed?



Weathering



Erosion



Mapping Patterns

Phenomena & Learning Targets

How can a slice of cake be like Earth's surface?

- Recognize that Earth's surface changes over time.
- Identify how patterns in rocks are evidence of Earth's changes.

How does the weather affect Earth?

- Recognize that water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around.
- Make and record observations for a given investigation to provide evidence for the effects of weathering.

Why is the land always changing?

- Give an example of an erosion process and explain how it moves weathered rock.
- Use practical observations as evidence for an explanation of how the slope of the land can affect the rate of erosion.

Where are the highest and lowest points on Earth?

- Locate land and water features on maps.
- Analyze map data to describe patterns of Earth's features.
- Interpret map data to describe patterns of Earth's features.

Performance Expectations

4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

4-ESS2-1 Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

4-ESS2-1 Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

4-ESS2-2 Analyze and interpret data from maps to describe patterns of Earth's features.

Science & Engineering Practices

Constructing Explanations and Designing Solutions

Planning and Carrying Out Investigations

Planning and Carrying Out Investigations

Analyzing and Interpreting Data

Disciplinary Core Ideas

ESS1.C: The History of Planet Earth

ESS2.E: Biogeology
ESS2.A: Earth Materials and Systems

ESS2.A: Earth Materials and Systems

ESS2.B: Plate Tectonics and Large-Scale System Interactions

Crosscutting Concepts

Patterns

Cause and Effect

Cause and Effect

Patterns

Engineering Design
Helping Nature

View Unit Online

Anchor Question: What things can we design to help living things survive and grow?



Living With Earth's Hazards



What A Pest!



How Can We Help?



Water Transporter

Phenomena & Learning Targets

How can we keep safe when natural disasters happen?

- Describe some natural hazards that cause problems for humans.
- Design and evaluate a potential solution to reduce harm caused by a natural hazard.

What is a pest?

- Understand that a pest can be a plant or animal in the wrong place.
- Collaborate to develop possible solutions by modifying a bike.

How can we help animals?

- Explore and define design opportunities.
- Develop and communicate design ideas through describing, drawing and modeling a sequence of steps.
- Use given components and equipment to safely make a solution.

How can we move water easily?

- Design, plan, produce, test and evaluate a model of a water irrigation system that could be used to water a vegetable garden.

Performance Expectations

4-ESS3-2 Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Science & Engineering Practices

Constructing Explanations and Designing Solutions

Constructing Explanations and Designing Solutions

Asking Questions and Defining Problems

Planning and Carrying Out Investigations

Disciplinary Core Ideas

ESS3.B: Natural Hazards
ETS1.B: Developing Possible Solutions

ETS1.B: Developing Possible Solutions
ETS1.B: Developing Possible Solutions

ETS1.A: Defining and Delimiting Engineering Problems

ETS1.B: Developing Possible Solutions
ETS1.C: Optimizing the Design Solution

Crosscutting Concepts

Cause and Effect

N/A

N/A

N/A

Grade 5

LIFE SCIENCE	PHYSICAL SCIENCE	EARTH AND SPACE SCIENCE	EARTH AND SPACE SCIENCE	ENGINEERING DESIGN
				
Matter and Energy in Organisms and Ecosystems	**Structures and Properties of Matter**	**Space Systems: Stars and the Solar System**	**Earth's Systems**	**Material Matters**
How does matter cycle through ecosystems? Where does the energy in food come from, and what is it used for?	*When matter changes, does its weight change, and can new substances be created by combining other substances?*	*What patterns are caused by the movements of Earth?*	*How do the Earth's biospheres interact?*	*Why are the properties of materials important when designing and producing?*
5 lessons + assessment	4 lessons + assessment	5 lessons + assessment	4 lessons + assessment	3 lessons + assessment

Life Science

Matter and Energy in Organisms and Ecosystems

Anchor Question: How does matter cycle through ecosystems?

View Unit Online

Lesson 1	Lesson 2	Lesson 3	Lesson 4
			
Energy for Living Things	**Plant Matters**	**Nature's Recyclers**	**A Web of Life**
Phenomena & Learning Targets			
Why do animals need to eat? • Understand that energy in animal's food was once energy from the sun. • Use models to describe the food chain. • Identify that energy from the sun that is captured by plants in the chemical process that forms plant matter.	**Do plants need soil to grow?** • Understand that plants get the materials they need for growth chiefly from air and water. • Support an argument with evidence.	**Who are nature's recyclers?** • Identify that decomposition restores some materials back to the soil. • Understand that some living things, such as fungi, are decomposers that break down dead organisms. • Develop a model to describe a phenomenon.	**How are living things in the Amazon connected?** • Recognize that the food of almost any kind of animal can be traced back to plants. • Understand that matter cycles between the air and soil and among plants, animals, and microbes. • Explain that a food web in a healthy environment is a system.
Performance Expectations			
5-LS3-1 Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	**5-LS1-1** Support an argument that plants get the materials they need for growth chiefly from air and water.	**5-LS2-1** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	**5-LS2-1** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
Science & Engineering Practices			
Developing and Using Models	Engaging in Argument from Evidence	Developing and Using Models	Developing and Using Models
Disciplinary Core Ideas			
PS3.D: Energy in Chemical Processes and Everyday Life LS1.C: Organization for Matter and Energy Flow in Organisms	LS1.C: Organization for Matter and Energy Flow in Organisms	LS2.A: Interdependent Relationships in Ecosystems LS2.B: Cycles of Matter and Energy Transfer in Ecosystems	LS2.A: Interdependent Relationships in Ecosystems LS2.B: Cycles of Matter and Energy Transfer in Ecosystems
Crosscutting Concepts			
Energy and Matter	Energy and Matter	Systems and System Models	Systems and System Models

Physical Science
Structures and Properties of Matter

View Unit Online

Anchor Question: What is matter and how does matter interact when mixed together?



A Damaged Web

Phenomena & Learning Targets

What happens when a food web is broken?

- Develop and understand that newly introduced species can affect the balance of interactions in a system like a food web.
- Identify that changing an aspect of the ecosystem will affect other aspects of the ecosystem.

Performance Expectations

5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Science & Engineering Practices

Developing and Using Models

Disciplinary Core Ideas

LS2.A: Interdependent Relationships in Ecosystems
LS2.B: Cycles of Matter and Energy Transfer in Ecosystems

Crosscutting Concepts

Systems and System Models



Too Small To Be Seen!

Phenomena & Learning Targets

If you can't see something, how do you know it's there?

- State that all matter is made of particles too small to see.
- Describe differences among the particles in solids, liquids, and gases.
- Use the movement of particles to explain observations of matter.

Performance Expectations

5-PS1-1 Develop a model to describe that matter is made of particles too small to be seen.

Science & Engineering Practices

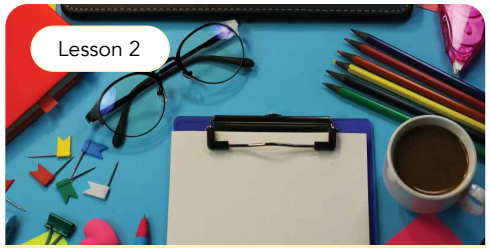
Developing and Using Models

Disciplinary Core Ideas

PS1.A: Structure and Properties of Matter

Crosscutting Concepts

Scale, Proportion, and Quantity



Material Properties

Phenomena & Learning Targets

How can we identify the properties of a material?

- Accurately describe the properties of common materials.
- Use the results of testing for particular properties to identify a material.

Performance Expectations

5-PS1-3 Make observations and measurements to identify materials based on their properties.

Science & Engineering Practices

Planning and Carrying Out Investigations

Disciplinary Core Ideas

PS1.A: Structure and Properties of Matter

Crosscutting Concepts

Scale, Proportion, and Quantity



Mixing Matter

Phenomena & Learning Targets

What can happen if we mix different substances together?

- Use experimental observations to determine whether mixing substances has produced a new substance.
- Identify variables that are changed or kept the same so that an experiment can be a fair test.

Performance Expectations

5-PS1-4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

Science & Engineering Practices

Planning and Carrying Out Investigations

Disciplinary Core Ideas

PS1.B: Chemical Reactions

Crosscutting Concepts

Cause and Effect

Earth and Space Science

Unit 1: Space Systems: Stars and the Solar System

Anchor Question: What patterns are caused by the movements of the Earth? View Unit Online



Weighing Matter



Hello Sun!



Day and Night - It's a Fine Line



Casting Shadows Great and Small

Phenomena & Learning Targets

When matter changes, does its weight change?

- Understand that the weight of matter is always conserved, even when that matter undergoes change.
- Use their own observations and measurements as evidence to support a claim.

How can we describe the sun?

- State that the sun is a star.
- Explain why the sun appears to be the biggest and brightest object in the sky.

What is the terminator line, and why does it move?

- Use a model to explain why we experience day and night.
- Graph data of the number of daylight hours and use their graphs to describe patterns.

Why do shadows come in different shapes and sizes?

- Understand that the shape & size of a shadow depends on the position & direction of the light source.
- Generate measurement data, use it to create a graph and analyze it to describe a pattern.
- Explain why their shadow changes over the course of a day.

Performance Expectations

5-PS1-2 Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.

5-ESS1-1 Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth.

5-ESS1-2 Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

5-ESS1-2 Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

Science & Engineering Practices

Using Mathematics and Computational Thinking

Engaging in Argument from Evidence

Analyzing and Interpreting Data

Analyzing and Interpreting Data

Disciplinary Core Ideas

PS1.A: Structure and Properties of Matter
PS1.B: Chemical Reactions

ESS1.A: The Universe and Its Stars

ESS1.B: Earth and the Solar System

ESS1.B: Earth and the Solar System

Crosscutting Concepts

Scale, Proportion, and Quantity

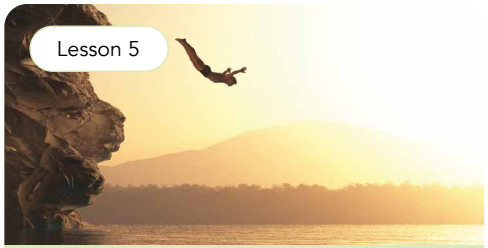
Scale, Proportion, and Quantity

Patterns

Patterns



Star Patterns



Goin' Down!

Phenomena & Learning Targets

Do stars move through space?

- Explain that the apparent movement and changing position of the stars across the night sky is due to the rotation of the Earth.
- Explain that different stars are visible at different times of the year because the Earth revolves around the sun.

Why do objects near Earth fall down?

- Explain that objects near the Earth's surface fall downwards because the force of gravity.
- Carry out an investigation and record observations.
- Make a claim and use evidence and reasoning to support it.
- Evaluate the validity of a claim.

Performance Expectations

5-ESS1-2 Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

5-PS2-1 Support an argument that the gravitational force exerted by Earth on objects is directed down.

Science & Engineering Practices

Analyzing and Interpreting Data

Engaging in Argument from Evidence

Disciplinary Core Ideas

ESS1.B: Earth and the Solar System

PS2.B: Types of Interactions

Crosscutting Concepts

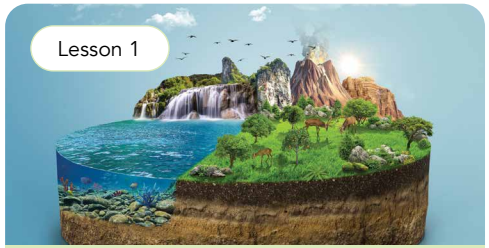
Patterns

Cause and Effect

Earth and Space Science
Unit 2: Earth's Systems

View Unit Online

Anchor Question: How can we describe Earth's systems and processes, and what are the effects of human impact on Earth?



Earth's Spheres



Interacting Systems



Water World



Science To The Rescue

Phenomena & Learning Targets

How can we describe Earth?

- Identify that the Earth's major systems are the geosphere, biosphere, hydrosphere, and/or atmosphere
- Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, or atmosphere interact.

How is planet Earth like a jigsaw puzzle?

- Identify that the Earth is a system with components that interact.
- Recognize that the ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate.

Why is Earth called the blue planet?

- Identify that nearly all of Earth's available water is in the ocean. Most freshwater is in glaciers or underground.
- Describe and graph the amounts of saltwater and freshwater to provide evidence about the distribution.

What happens to all our plastic trash?

- Identify that human activities have had major effects on Earth's natural resources.
- Recognize that individuals and communities are doing things to help protect Earth's resources and environments.

Performance Expectations

5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

5-ESS2-2 Describe and graph the amounts of saltwater and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Science & Engineering Practices

Developing and Using Models

Developing and Using Models

Using Mathematics and Computational Thinking

Obtaining, Evaluating, and Communicating Information

Disciplinary Core Ideas

ESS2.A: Earth Materials and Systems

ESS2.A: Earth Materials and Systems

ESS2.C: The Roles of Water in Earth's Surface Processes

ESS3.C: Human Impacts on Earth Systems

Crosscutting Concepts

Systems and System Models

Systems and System Models

Scale, Proportion, and Quantity

Systems and System Models

Engineering Design
Material Matters

View Unit Online

Anchor Question: Why are materials important when designing products?



Plastic- Not So Fantastic!



Fashionable Fabrics



Keeping the Rain Off

Phenomena & Learning Targets

Why is it important to reduce our use of plastic?

- Identify the properties of a material that make it suitable for a particular purpose.
- Understand that some choices of materials are more sustainable than others.

Why are different clothes made from different materials?

- Identify the properties of a material that make it suitable for a particular purpose.
- Understand some choices of materials are more sustainable than others.
- Use experimental observations to explain why certain materials are chosen for certain products.

Can we mimic nature and make a material waterproof?

- Understand that some choices of materials are more sustainable than others.
- Understand that the properties of a material can be changed.
- Design, test and evaluate a sustainable product made from a material with suitable properties.

Performance Expectations

3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2 Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.

Science & Engineering Practices

Planning and Carrying Out Investigations

Asking Questions and Defining Problems

Constructing Explanations and Designing Solutions

Disciplinary Core Ideas

ETS1.B: Developing Possible Solutions
ETS1.C: Optimizing the Design Solution

ETS1.A: Defining and Delimiting Engineering Problems

ETS1.B: Developing Possible Solutions

Crosscutting Concepts

N/A

N/A

N/A

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