Mystery science

Units & Storylines Overview



A Glimpse into Our Curriculum

Mystery Science is a hands-on curriculum that is fully standards-aligned.

Mystery Science's units of study contain:

- Hands-on activities with every lesson
- Real-world investigative phenomena
- Thoughtful discussions to build background knowledge
- Lesson & unit assessments to evaluate comprehension
- Curated, cross-curricular extensions

Other tools:

<u>Standards Alignment Guides</u> <u>Pacing Guides</u> <u>Anchor Layer Teacher Guides</u>

About Mystery Science Units

Each of our standards-aligned lessons begin with real-life phenomena, have in-depth discussion questions, and feature hands-on activities. There are curated extensions, vocabulary resources, and more offered with every lesson. With the Anchor Layer off, teachers can choose to teach our science unit lessons in any order they need or in isolation.





The Anchor Layer

The Anchor Layer is for teachers who are prepared to teach units in their entirety, as it builds ideas off of the concepts presented in each lesson within the unit. Turning on the Anchor Layer adds:

- A unit-level anchor phenomenon before the first lesson,
- A connection at the end of every lesson where students apply what they've learned to the anchor phenomenon, and
- A performance task where students apply what they learned to a new project.



Science Units with Anchor Layer ON

Kindergarten

Life Science	Page 4
Animal Needs	-
Plant Needs	
Earth & Space Science	Page 6
Severe Weather	
Weather Patterns	
Physical Science	Page 8
Sunlight & Warmth	-
Pushes & Pulls	

3rd Grade

Life Science	Page 22
Fossils & Changing	
Environments	
Life Cycles	
Heredity, Survival, &	
Selection	
Earth & Space Science	Page 27
Weather & Climate	
Physical Science	Page 29
Forces, Motion, & Magnets	

1st Grade

Life Science	Page 11
Animal Traits & Survival	
Plant Traits & Survival	
Earth & Space Science	Page 13
Day Patterns	
Night Patterns	
Physical Science	Page 15
Light, Sound, &	_
Communication	

4th Grade

Life Science	Page 31
Human Body, Vision, & The	-
Brain	
Animal & Plant Adaptations	
Earth & Space Science	Page 33
Earth's Features &	
Processes	
Physical Science	Page 35
Sound, Waves, &	-
Communication	
Energy & Energy Transfer	
Electricity, Light, & Heat	

2nd Grade

Life Science	Page 16
Animal Biodiversity	-
Plant Adaptations	
Earth & Space Science	Page 18
Erosion & Earth's Surface	-
Physical Science	Page 20
Material Properties	-

5th Grade

Life Science Ecosystems & The Food	Page 38
Web Earth & Space Science	Page 40
Water Cycle & Earth's	
Systems	
Earth & Space Patterns	
Stars & Planets	
Physical Science	Page 44
Chemical Reactions	

Animal Needs • Unit Summary

See Anchor Layer Teacher Guide

In this unit, students use observations to understand the basic needs of animals. Students explore how animals need things to eat and a safe place to live, and also how animals can change their environments to meet those needs.

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
 K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive. 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. K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) 	 Analyzing and Interpreting Data Developing and Using Models Engaging in Argument from Evidence Obtaining, Evaluating, and 	 LSI.C. Organization for Matter and Energy Flow in Organisms ESS3.A. Natural Resources ESS2.E. Biogeology 	• Systems and System Models • Patterns
can change the environment to meet their needs	Communicating Information		







Plant Needs • Unit Summary

See Anchor Layer Teacher Guide

In this unit, students use observations to understand the basic needs of plants, such as water and sunlight. They also observe young plants and the changes they undergo as they grow from seed to seedling.

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
• K-LS1-1. Use observations to describe patterns of what plants and animals	 Analyzing and Interpreting Data Planning and Carrying Out 	• LS1.C. Organization for Matter and Energy Flow in	 Cause and Effect Patterns
(including humans) need to survive.	Investigations	Organisms	
• K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land,	• Obtaining, Evaluating, and Communicating Information	• ESS3.C: Human Impacts on Earth Systems	
water, air, and/or other living things in the local environment.			





Severe Weather • Unit Summary

See Anchor Layer Teacher Guide

In this unit, students explore storms and severe weather! They obtain information from weather forecasts to prepare for storms and stay safe. They also practice describing the various characteristics of weather (wind, clouds, temperature, and precipitation) in order to make their own predictions about storms.

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
• K-ESS2-1. Use and share observations of	• Obtaining, Evaluating, and	• ESS3.B: Natural Hazards	• Cause and Effect
local weather conditions to describe	Communicating Information	• ESS2.D: Weather and	• Patterns
patterns over time.	 Asking Questions and Defining 	Climate	
• K-ESS3-2. Ask questions to obtain	Problems		
information about the purpose of weather	 Analyzing and Interpreting Data 		
forecasting to prepare for, and respond to,			
severe weather.			





Weather Patterns • Unit Summary

In this unit, students gather evidence in order to identify daily and seasonal weather patterns. They use those patterns to explain mysteries like why you might lose your jacket during the day or why birds lay their eggs at certain times of the year.

Performance	Science & Engineering	Disciplinary	Crosscutting
Expectations	Practices	Core Ideas	Concepts
 K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time. K-ESS2-2. Construct an argument supported by evidence for how plants & animals (including humans) can change the environment to meet their needs. 	 Obtaining, Evaluating, and Communicating Information Asking Questions and Defining Problems Analyzing and Interpreting Data Engaging in Argument from Evidence Developing and Using Models 	• ESS2.E: Biogeology • ESS2.D: Weather and Climate	 Systems and System Models Patterns Structure and Function





See Anchor Layer Teacher Guide

Sunlight & Warmth • Unit Summary

designed to solve the same problem to compare the strengths and weaknesses of how each performs.

See Anchor Layer Teacher Guide

In this unit, students make observations to explore how sunlight warms the Earth's surface. The Sun's energy heats up the pavement, keeps us warm, and can even melt marshmallows. Using what they learn, students think about ways that shade and structures can reduce the warming effect of the Sun.

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
• K-PS3-1. Make observations to determine the effect of	Analyzing and Interpreting	• LSI.C. Organization	 Systems and
sunlight on Earth's surface.	Data	for Matter and Energy	System Models
• K-PS3-2. Use tools and materials to design and build a	 Developing and Using 	Flow in Organisms	 Patterns
structure that will reduce the warming effect of sunlight on	Models	• ESS3.A. Natural	
an area.	 Engaging in Argument 	Resources	
• K-2-ETS1-1. Ask questions, make observations, and gather	from Evidence	• ESS2.E. Biogeology	
information about a situation people want to change to	 Obtaining, Evaluating, and 		
define a simple problem that can be solved through the	Communicating		
development of a new or improved object or tool.	Information		
 K-2-ETS1-3. Analyze data from tests of two objects 			

Foot Anchor Lesson 1 Lesson 2 Lesson 3 Phenomenon And Ball make Sunlight, Heat, & Earth's Sunlight, Warming, & Sunlight, Heat, & Earth's Sunlight & Warmth Surface Surface Engineering Why does it get cold in How could you walk barefoot Solar Sizzle How could you warm up winter? across hot pavement without a frozen playground? burning your feet? \bigvee **Anchor Connection Anchor Connection Anchor Connection**



Surface Can you use the Sun to cook food?

Pushes & Pulls • Unit Summary (pg 1 of 2)

In this unit, students are introduced to pushes and pulls and how those affect the motion of objects. Students observe and investigate the effects of what happens when the strength or direction of those pushes and pulls are changed.

Performance	Science & Engineering	Disciplinary	Crosscutting
Expectations	Practices	Core Ideas	Concepts
 K-PS2-1. Plan & conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. K-PS2-2. 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-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. 	 Analyzing and Interpreting Data Developing and Using Models Engaging in Argument from Evidence Obtaining, Evaluating, and Communicating Information 	 LSI.C. Organization for Matter and Energy Flow in Organisms ESS3.A. Natural Resources ESS2.E. Biogeology 	 Systems and System Models Patterns

Pushes & Pulls Lesson Flow on Next Page

<u>See Anchor Layer Teacher Guide</u>

Pushes & Pulls • Lesson Flow (pg 2 of 2)



Animal Traits & Survival • Unit Summary

In this unit, students explore how the external characteristics of animals are essential for their survival. Students also make observations of parents and their offspring, determining how they are similar and how their behaviors help offspring survive.

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
 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-LS1-2. 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. 	 Constructing Explanations and Designing Solutions Developing and Using Models Planning and Carrying Out Investigations Analyzing and Interpreting Data Obtaining, Evaluating, and Communicating Information Engaging in Argument from Evidence 	 LS3.A: Inheritance of Traits LS3.B: Variation of Tro LS1.A: Structure and Function LS1.B: Growth and Development of Organisms 	 Structure and function Patterns
Anchor Phenomenon Animal Structures and Behaviors Squirrel Secrets Animal Structures and Behaviors	help a lost Survival	ctures & A O M	esson 3 We be a base We we
Anchor Co	onnection Anchor Co	onnection	Anchor Connection









Plant Traits & Survival • Unit Summary

See Anchor Layer Teacher Guide

In this unit, students explore the different parts of plants and how those parts are essential for plant survival.

Performance Expectations

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

• 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.

• K-2-ETSI-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-ETSI-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	Disciplinary Core Ideas	Crosscutting Concepts
	Constructing	• LS3.A:	Structure
like,	Explanations and	Inheritance of	and function
	Designing Solutions	Traits	• Patterns
ı by	 Developing and Using 	• LS3.B: Variation	
С	Models	of Traits	
	 Planning and Carrying 	• LS1.A: Structure	
	Out Investigations	and Function	
a	 Analyzing and 	• LS1.B: Growth	
fa	Interpreting Data	and Development	
	• Obtaining, Evaluating,	of Organisms	
lel to	and Communicating		
d to	Information		
	 Engaging in Argument 		
)	from Evidence		







Mystery science

Day Patterns • Unit Summary

See Anchor Layer Teacher Guide

In this unit, students make observations of the Sun and shadows throughout the day and across the seasons. They use their observations to understand patterns that occur throughout the day.

Performance	Science & Engineering	Disciplinary	Crosscutting
Expectations	Practices	Core Ideas	Concepts
 I-ESSI-I. Use observations of the sun, moon, and stars to describe patterns that can be predicted. I-ESSI-2. Make observations at different times of year to relate the amount of daylight to the time of year. 	 Analyzing and Interpreting Data Planning and Carrying Out Investigations Developing and Using Models Engaging in Argument from Evidence Obtaining, Evaluating, and Communicating Information 	• ESS1.A: The Universe and its Stars • ESS1.B: Earth and the Solar System	• Patterns







Mystery science

Night Patterns • Unit Summary

See Anchor Layer Teacher Guide

In this unit, students explore the Moon and stars. They observe and record the appearance of the Moon to determine its cyclical pattern. They also determine why stars are only visible at night.

Performance	Science & Engineering	Disciplinary	Crosscutting
Expectations	Practices	Core Ideas	Concepts
• 1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted.	 Analyzing and Interpreting Data Planning and Carrying Out Investigations Developing and Using Models Constructing Explanations and Designing Solutions Obtaining, Evaluating, and Communicating Information 	• ESS1.A: The Universe and its Stars	• Patterns • Cause and Effect





Light, Sound, & Communication • Unit Summary

In this unit, students investigate light and sound! They explore how materials vibrate and how vibrating materials can make sounds. They also investigate light and illumination and use those investigations to create simple devices that allow them to communicate across a distance.

Performance	
Expectations	

Anchor

Phenomenon

Light, Sound, &

Communication

Everglades Adventure

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

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

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

• 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.

• 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.

Lesson 1

Sounds & Vibrations

sounds in cartoons?

How do they make silly

Anchor Connection

Practices	Core Ideas
Constructing	• PS4.A: Wave
Explanations and	Properties
Designing Solutions	• PS4.B:
 Planning and Carrying 	Electromagnetic
Out Investigations	Radiation
 Engaging in Argument 	• PS4.C:
from Evidence	Information
• Obtaining, Evaluating,	Technologies and
and Communicating	Instrumentation
Information	• ETS1.B: Developing

Science & Engineering

Lesson 2

from?

Sounds & Vibrations

Where do sounds come

Anchor Connection

See Anchor Layer Teacher Guide

Disciplinary

Possible Solutions

Lesson 3 Light, Materials, Transparent & Opaque What if there were no windows? Anchor Connection

Performance Lesson 4 Lesson 5 Lesson 6 and Task Light & Illumination Light, Communication, & Light, Sounds & Light & Sound Can you see in the dark? Engineering How could Communication What do we see and hear you send a secret message How do boats find their in the Everglades at to someone far away? way in the fog? night? Anchor Connection **Anchor Connection** Anchor Connection

Crosscutting Concepts

Cause and

Effect

Patterns

• 2-LS4-1. Make observations of plants and animals to

• 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

physical model to illustrate how the shape of an object

helps it function as needed to solve a given problem.

• K-2-ETS1-2. Develop a simple sketch, drawing, or

compare the diversity of life in different habitats.

In this unit, students begin to develop an understanding of the world's animal biodiversity. They explore animal classification and the traits that define each group. Students then turn their focus to habitats and how the surrounding environment affects what organisms live in a particular environment. Assessments

Performance **Expectations**

or tool.

Science & Engineering Practices

- Obtaining, Evaluating, and **Communicating Information**
- Analyzing and Interpreting Data
- Planning and Carrying Out
- Investigations
- Engaging in Argument from Evidence
- Asking Questions and Defining Problems
- Constructing Explanations and **Designing Solutions**

Disciplinary Core Ideas

• LS4.D:

Humans

Concepts

Crosscutting

- Patterns
- Cause and Effect
- **Biodiversity and**

See Anchor Layer Teacher Guide

- Developing and Using Models





Lesson 4



Biodiversity, Habitats, & Species Where else do bats live?

Mystery science

Plant Adaptations • Unit Summary

In this unit, students explore the needs of plants through hands-on investigations. They explore how and why plants disperse their seeds, what those seeds need in order to grow, and what the adult plants need in order to survive and thrive. <u>Assessments</u>

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
• K-2-ETS1-2. Develop a simple sketch, drawing, or	 Developing and Using 	• LS2.A: Interdependent	• Structure and
physical model to illustrate how the shape of an object	Models	Relationships in	Function
helps it function as needed to solve a given problem.	 Planning and Carrying 	Ecosystems	 Cause and Effect
 2-LS2-1. Plan and conduct an investigation to 	Out Investigations		
determine if plants need sunlight and water to grow.	 Analyzing and 		
• 2-LS2-2. Develop a simple model that mimics the	Interpreting Data		
function of an animal in dispersing seeds or pollinating			
plants.			







Erosion & Earth's Surface • Unit Summary (pg 1 of 2)

See Anchor Layer Teacher Guide

In this unit, students explore how water shapes the Earth's surface. Students construct and use models of mountains to demonstrate that water flows downhill, and in the process, transforms huge rocks into the tiny grains of sand we find at the beach. Students also construct and use model hills to determine the causes of erosion, and to design solutions to problems caused by erosion. <u>Assessments</u>

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
• 2-ESSI-1. Use information from several sources to	• Developing and Using	• ESS2.B: Plate Tectonics	• Patterns
provide evidence that Earth events can occur quickly or	Models	and Large-Scale System	Cause and Effect
slowly.	 Planning and Carrying 	Interactions	 Stability and
• 2-ESS2-1. Compare multiple solutions designed to	Out Investigations	• ESS2.C: The Roles of	Change
slow or prevent wind or water from changing the shape	Constructing	Water in Erosion & Earth's	
of the land.	Explanations and	Surface	
• 2-ESS2-2. Develop a model to represent the shapes	Designing Solutions	• ESSI.C: The History of	
and kinds of land and bodies of water in an area.		Planet Earth	
• 2-ESS2-3. Obtain information to identify where water		• ESS2.A: Earth Materials	
is found on Earth and that it can be solid or liquid.		and Systems	
• 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			

Erosion & Earth's Surface Lesson Flow on Next Page

helps it function as needed to solve a given problem.
K-2-ETSI-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Erosion & Earth's Surface • Lesson Flow (pg 2 of 2)



Material Properties • Unit Summary (pg 1 of 2)

In this unit, students explore the properties of materials and matter! They describe and classify different types of materials by properties like hardness, flexibility, and absorbency, and they investigate how those properties are useful in meeting basic human needs (such as clothing and cooking). They also investigate how heating and cooling affect the properties of materials. The anchor phenomenon for this unit can be found inside of a special type factory called a Foundry. Foundries are places where people melt solid metal into a liquid that can be poured into new shapes. Foundries can be dangerous places to work, so how do the people that work in foundries stay safe? <u>Assessments</u>

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
• 2-PS1-1. Plan and conduct an investigation to describe	 Asking Questions and 	• PS1.A: Structure and	 Structure and
and classify different kinds of materials by their	Defining Problems	Properties of Matter	Function
observable properties.	 Planning and Carrying 	• PS1.B: Chemical	Cause and Effect
• 2-PS1-2. Analyze data obtained from testing different	Out Investigations	Reactions	• Energy and Matter
materials to determine which materials have the	Constructing	• ETS1.A: Defining and	• Patterns
properties that are best suited for an intended purpose.	Explanations and	Delimiting Engineering	
 2-PS1-3. Make observations to construct an 	Designing Solutions	Problems	
evidence-based account of how an object made of a	 Analyzing and 	• ETS1.B: Developing	
small set of pieces can be disassembled and made into	Interpreting Data	Possible Solutions	
a new object.	 Developing and Using 	• ETS1.C: Optimizing the	
• 2-PS1-4. Construct an argument with evidence that	Models	Design Solution	
some changes caused by heating or cooling can be			
reversed and some cannot.			

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

Material Properties • Lesson Flow (pg 2 of 2)



Fossils & Changing Environments • Unit Summary

In this unit, students develop an understanding of how animals and their environments have changed through time. The anchor phenomenon for this unit is a water-filled cave that contains footprints, fossils, and ancient fire pits. Fossils provide a window into the animals and habitats of the past. Analyzing the traits of animals that are alive today and comparing them to fossils, provides evidence of how these ancient organisms and environments of the past may have appeared. The anchor phenomenon for this unit is a water-filled cave that contains footprints, fossils, and ancient fire pits. How can these things be found deep underwater? <u>Assessments</u>

Performance Ex	pectations
----------------	------------

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

- **Science & Engineering Practices**
- Analyzing and Interpreting Data
- Engaging in Argument from
- Evidence
- Using Mathematics and Computational Thinking
 Planning and Carrying Out Investigations
- Disciplinary Core Ideas

• LS4.A: Evidence of Common Ancestry and Diversity

Crosscutting Concepts

- Scale, Proportion, and Quantity
- Structure and Function
- Patterns





Mystery science

See Anchor Layer Teacher Guide

Life Cycles • Unit Summary (pg 1 of 2)

In this unit, students compare and contrast the life cycles of both animals and plants. Students create models to build an understanding that all organisms share certain stages in their life cycles: birth, growth, reproduction, and death. Students also explore how an understanding of life cycles can aid in solving problems that occur when there are too many or too few organisms in a particular environment. <u>Assessments</u>

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
• 3-LS2-1. Construct an argument that some animals form	 Analyzing and 	• LS3.A: Inheritance of	• Patterns
groups that help members survive.	Interpreting Data	Traits	 Cause and Effect
 3-LS3-1. Analyze and interpret data to provide evidence 	 Constructing 	• LS3.B: Variation of	 Systems and
that plants and animals have traits inherited from parents	Explanations and	Traits	System Models
and that variation of these traits exists in a group of similar	Designing Solutions	• LS4.B: Natural	 Stability and
organisms.	 Planning and Carrying 	Selection	Change
• 3-LS3-2. Use evidence to support the explanation that	Out Investigations	 LS4.C: Adaptation 	
traits can be influenced by the environment.	 Engaging in Argument 	• LS2.D: Social	
• 3-LS4-2. Use evidence to construct an explanation for how	from Evidence	Interactions and	
the variations in characteristics among individuals of the	 Obtaining, Evaluating, 	Group Behavior	
same species may provide advantages in surviving, finding	and Communicating		
mates, and reproducing.	Information		
• 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.			

<u>See Anchor Layer Teacher Guide</u>

Life Cycle • Lesson Flow (pg 2 of 2)



mates, and reproducing.

Heredity, Survival, & Selection • Unit Summary (pg 1 of 2) See Anchor Layer Teacher Guide

In this unit, students explore the inherited and acquired traits of plants and animals. Analyzing traits provides evidence for how those traits vary, how they are inherited, and how they have changed over time through both artificial and natural selection. Students also examine how a particular environment can affect traits, including inherited traits that provide animals with an advantage for survival. <u>Assessments</u>

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
• 3-LS2-1. Construct an argument that some animals form	 Analyzing and 	• LS3.A:	• Systems and
groups that help members survive.	Interpreting Data	Inheritance of	System Models
• 3-LS3-1. Analyze and interpret data to provide evidence that	Constructing	Traits	• Patterns
plants and animals have traits inherited from parents and	Explanations and	• LS3.B: Variation	 Stability and
that variation of these traits exists in a group of similar	Designing Solutions	of Traits	Change
organisms	 Planning and Carrying 	• LS4.B: Natural	Cause and Effect
• 3-LS3-2. Use evidence to support the explanation that traits	Out Investigations	Selection	
can be influenced by the environment.	• Engaging in Argument	• LS4.C:	
• 3-LS4-3. Construct an argument with evidence that in a	from Evidence	Adaptation	
particular habitat some organisms can survive well, some	• Obtaining, Evaluating,	• LS2.D: Social	
survive less well, and some cannot survive at all.	and Communicating	Interactions and	
• 3-LS4-2. Use evidence to construct an explanation for how	Information	Group Behavior	
the variations in characteristics among individuals of the			
same species may provide advantages in surviving, finding			

Heredity, Survival, & Selection • Lesson Flow (pg 2 of 2)



See Anchor Layer Teacher Guide

Weather & Climate • Unit Summary (pg 1 of 2)

In this unit, students investigate and make predictions about the weather through careful observation of the clouds and wind. Students also learn to differentiate between weather and climate and use models to reveal global climate patterns. <u>Assessments</u>

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
• 3-ESS2-1. Represent data in tables and graphical	• Planning and Carrying Out	• ESS2.D: Weather and	Structure and
displays to describe typical weather conditions	Investigations	Climate	Function
expected during a particular season.	 Developing and Using 	• ESS3.B: Natural	 Stability and Change
• 3-ESS2-2. Obtain and combine information to	Models	Hazards	Cause and Effect
describe climates in different regions of the world.	 Analyzing and Interpreting 	• ETS1.A: Defining and	• Patterns
• 3-ESS3-1. Make a claim about the merit of a	Data	Delimiting Engineering	
design solution that reduces the impacts of a	 Obtaining, Evaluating, and 	Problems	
weather-related hazard.	Communicating Information	• ETS1.B: Developing	
• 3-5-ETS1-1. Define a simple design problem	 Asking Questions and 	Possible Solutions	
reflecting a need or a want that includes specified	Defining Problems	• ETS1.C: Optimizing the	
criteria for success and constraints on materials,	 Constructing Explanations 	Design Solution	
time, or cost.	and Designing Solutions		
• 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.			

Weather & Climate Lesson Flow on Next Page

• 3-5-ETSI-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.

Weather & Climate • Lesson Flow (pg 2 of 2)



Forces, Motion, & Magnets • Unit Summary (pg 1 of 2)

In this unit, students explore the forces all around them. They investigate the effects of balanced and unbalanced forces, the pushes and pulls of bridge structures, and the effects of gravity and friction on the motion of objects. Students also explore the power of magnetic forces and design solutions to everyday problems using their knowledge of these forces. <u>Assessments</u>

Performance	Science & Engineering	Disciplinary	Crosscutting
Expectations	Practices	Core Ideas	Concepts
 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. 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-PS2-4. Define a simple design problem that can be solved by applying scientific ideas about magnets. 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 possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. 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. 	 Planning and Carrying Out Investigations Developing and Using Models Asking Questions and Defining Problems Constructing Explanations and Designing Solutions 	 PS2.A: Forces and Motion PS2.B: Types of Interactions ETS1.A: Defining and Delimiting Engineering Problems ETS1.B: Developing Possible Solutions ETS1.C: Optimizing the Design Solution 	 Structure and Function Cause and Effect Patterns

Forces, Motion, & Magnets Lesson Flow on Next Page

See Anchor Layer Teacher Guide

Forces, Motion, & Magnets • Lesson Flow (pg 2 of 2)



In this unit, students investigate structures and functions of the human body. Students explore how our bones and muscles are interconnected, how our eyes interact with light and impact our vision, and how our brain responds to stimuli in our environment. <u>Assessments</u>

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
• 4-LS1-1. Construct an argument that plants and	• Planning and Carrying Out	• LS1.A: Structure and	 Systems and System
animals have internal and external structures that	Investigations	Function	Models
function to support survival, growth, behavior, and	 Developing and Using 	• PS4.B:	Cause and Effect
reproduction.	Models	Electromagnetic	
• 4-LS1-2. Use a model to describe that animals	 Analyzing and Interpreting 	Radiation	
receive different types of information through their	Data	• LS1.D: Information	
senses, process the information in their brain, and	 Constructing Explanations 	Processing	
respond to the information in different ways.	and Designing Solutions		
 4-PS4-2. Develop a model to describe that light 			
reflecting from objects and entering the eye			





Anchor Connection

Lesson 4

allows objects to be seen.





<u>See Anchor Layer Teacher Guide</u>

See Teacher Guide

Animal & Plant Adaptations • Unit Summary

In this unit, students explore the adaptations of animals and plants. Students investigate how the external and internal structures of an organism work together as an interconnected system that aid in their growth and survival. They also use models to explore how a combination of instincts and memories influence animal behavior.

Performance	Science & Engineering	Disciplinary	Crosscutting
Expectations	Practices	Core Ideas	Concepts
 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. 	 Engaging in Argument from Evidence Developing and Using Models Constructing Explanations and Designing Solutions 	 LS1.A: Structure and Function LS1.D: Information Processing 	• Systems and System Models





Earth's Features & Processes • Unit Summary (pg 1 of 2) See Anchor Layer Teacher Guide

In this unit, students investigate features and processes of the Earth's surface. Students explore the rapid process of volcanic eruptions! In contrast, students also explore the gradual Earth processes of weathering and erosion. Students apply their knowledge and design solutions to mitigate the impacts of these processes on humans. <u>Assessments</u>

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
• 4-ESS1-1. Identify evidence from patterns in rock	 Analyzing and Interpreting 	• ETS1.B: Designing	• Patterns
formations and fossils in rock layers to support an	Data	Solutions to Engineering	 Cause and Effect
explanation for changes in a landscape over time.	• Engaging in Argument from	Problems	
 4-ESS2-1. Make observations and/or 	Evidence	• ESSI.C: The History of	
measurements to provide evidence of the effects of	 Constructing Explanations 	Planet Earth	
weathering or the rate of erosion by water, ice, wind,	and Designing Solutions	• ESS2.A: Earth Materials	
or vegetation	• Planning and Carrying Out	and Systems	
• 4-ESS2-2. Analyze and interpret data from maps	Investigations	• ESS2.B: Plate Tectonics	
to describe patterns of Earth's features.	 Constructing Explanations 	and Large-Scale System	
• 4-ESS3-2. Generate and compare multiple	and Designing Solutions	Interactions	
solutions to reduce the impacts of natural Earth	 Developing and Using 	• ESS2.E: Biogeology	
processes on humans.	Models	• Ess3.B: Natural Hazards	
 3-5-ETS1-2. Generate and compare multiple 		•ETS1.B: Designing	
possible solutions to a problem based on how well		Solutions to Engineering	
each is likely to meet the criteria and constraints of		Problems	
the problem			

Earth's Features & Processes Lesson Flow on Next Page

Earth's Features & Processes • Lesson Flow (pg 2 of 2)



Sound, Waves, & Communication • Unit Summary

In this unit, students investigate the science of sound. Students construct physical devices to feel the vibrations that allow us to communicate across distances. Students also use digital devices to visualize the characteristics of different sound waves that cause us to hear different things. <u>Assessments</u>

Performance ExpectationsScience & Engineering PracticesDisciplinary Core IdeasCrosscutting Concepts• 4-PS4-1. Develop a model of waves to describe patterns• Planning and Carrying• PS4.A: Wave Properties• Patterns				
• 4-PS4-1. Develop a model of waves to describe patterns • Planning and Carrying • PS4.A: Wave Properties • Patterns				•
in terms of amplitude and wavelength and that wavesOut Investigations·PS4.C: Informationcan cause objects to move.·Developing and UsingTechnologies and·4-PS4-3. Generate and compare multiple solutions thatModelsInstrumentationuse patterns to transfer information.·Constructing Explanation·ETS1.B: Developing·3-5-ETS1-2. Generate and compare multiple possibleand Designing SolutionsPossible Solutionssolutions to a problem based on how well each is likely to·ETS1.C: Optimizing the·meet the criteria and constraints of the problem.·ETS1.S: Optimizing the·3-5-ETS1-3. Plan and carry out fair tests in which·ETS1.S: Optimizing thevariables are controlled and failure points are considered·ETS1.S: Optimizing the·to identify aspects of a model or prototype that can be·ETS1.S: Optimizing the	 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. 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-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered 	Out Investigations • Developing and Using Models • Constructing Explanations	 PS4.C: Information Technologies and Instrumentation ETS1.B: Developing Possible Solutions ETS1.C: Optimizing the 	• Patterns

improved.







Engineering How can you make sound waves visible?



Energy & Energy Transfer • Unit Summary

See Anchor Layer Teacher Guide

In this unit, students explore energy! Students investigate how energy is stored, how it can make objects move, and how collisions transfer energy between objects. Students also construct chain reaction machines to explore the many different ways that energy can be transferred. Assessments

Practices

Performance **Expectations**

Anchor Connection

• 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-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. • 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 possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

• 3-5-ETSI-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.

 Analyzing and
Interpreting Data
 Developing and Using
Models
 Constructing
Explanations and
Designing Solutions
 Asking Questions and
Defining Problems

Science & Engineering

• PS3.A: Definitions of	• Energy and
Energy	Matter
• PS3.B: Conservation of	 Systems and
Energy and Energy	System Models
Transfer	
• PS3.C: Relationship	
Between Energy and	
Forces	
• ETS1.A: Defining and	
Delimiting Engineering	
Problems	

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

Disciplinary

Core Ideas



Anchor Connection

Crosscutting

Concepts

See Anchor Layer Teacher Guide

Mystery science

In this unit, students explore the different forms of energy! Students investigate how energy can change form from heat energy into electrical energy. Students also construct devices that convert energy from one form into another, such as heat into motion and electricity into light.

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
 4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. 4-PS3-2. Make observations to provide evidence that 	 Obtaining, Evaluating, and Communicating Information Using Mathematics and 	• SS3.A: Natural Resources • PS3.D: Energy in Chemical Processes and Everyday Life	• Energy and Matter • Cause and Effect
 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 	Computational Thinking • Developing and Using Models	• ETSI.A: Defining and Delimiting Engineering Problems	
 a device that converts energy from one form to another. 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. 	 Constructing Explanations and Designing Solutions Planning and Carrying 	ETS1.B: Developing Possible Solutions ETS1.C: Optimizing the Design Solution	
 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 	Out Investigations	• PS3.B: Conservation of Energy and Energy Transfer	
improved.			

Anchor Phenomenon

Electricity, Light, & Heat The Three Towers



Renewable Energy & Natural Resources What's the best way to light up a city?



Electrical Energy What if there were no electricity?



Heat Energy & Energy Transfer How long did it take to travel across the country before cars and planes?



Ecosystems & The Food Web • Unit Summary (pg 1 of 2) <u>See Anchor Layer Teacher Guide</u>

In this unit, students explore how organisms depend on one another and form an interconnected ecosystem. Students investigate food chains, food webs, and the importance of producers, consumers, and decomposers. <u>Assessments</u>

Performance Expectations	Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
• 5-LS1-1. Support an argument that plants get	• Planning and Carrying Out	• LS2.A: Interdependent	• Energy and Matter
the materials they need for growth chiefly from	Investigations	Relationships in	 Systems and
air and water.	 Developing and Using 	Ecosystems	System Models
 5-LS2-1. Develop a model to describe the 	Models	 LS2.B: Cycles of Matter 	 Cause and Effect
movement of matter among plants, animals,	 Obtaining, Evaluating, and 	and Energy Transfer in	
decomposers, and the environment.	Communicating Information	Ecosystems	
• 5-ESS3-1. Obtain and combine information	 Constructing Explanations 	 LS1.C. Organization for 	
about ways individual communities use science	and Designing Solutions	Matter and Energy Flow in	
ideas to protect the Earth's resources and	 Planning and Carrying Out 	Organisms	
environment.	Investigations	• ESS3.C: Human Impacts	
• 5-PS3-1. Use models to describe that energy in	 Analyzing and Interpreting 	on Earth Systems	
animals' food (used for body repair, growth,	Data	• PS3.D: Energy in	
motion, and to maintain body warmth) was		Chemical Processes and	
once energy from the sun.		Everyday Life	

Ecosystems & The Food Web Lesson Flow on Next Page

Ecosystems & The Food Web • Lesson Flow (pg 2 of 2)





How could we grow food on Mars?

Water Cycle & Earth's Systems • Unit Summary (pg l of 2) See Anchor Layer Teacher Guide

In this unit, students consider the profound importance of water as a natural resource. Students investigate the distribution of water, how it cycles through Earth's systems, and explore how it affects human societies. <u>Assessments</u>

 5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. Using Mathematics and ESS2.A: Earth Materials and Systems and Systems Socale, Proportion, and Quantity Systems and System Models Patterns Various reservoirs to provide evidence about the Models Obtaining, Evaluating, and Properties of Matter Systems and Structure and Engaging in Argument from Engaging in Argument from Engaging and Carrying Out ETS1.B: Developing Systems and Carrying Out Structure and compare multiple Investigations Asking Questions and ETS1.C: Optimizing the Design Solution 	Performance	Science & Engineering	Disciplinary	Crosscutting
	Expectations	Practices	Core Ideas	Concepts
constraints of the problem. • 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	 • 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 and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. • 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 possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. • 3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points 	 Analyzing and Interpreting Data Using Mathematics and Computational Thinking Developing and Using Models Obtaining, Evaluating, and Communicating Information Engaging in Argument from Evidence Planning and Carrying Out Investigations Asking Questions and 	 ESS2.A: Earth Materials and Systems ESS2.C: The Roles of Water in Earth's Surface Processes PSI.A: Structure and Properties of Matter ETS1.A: Defining and Delimiting Engineering Problems ETS1.B: Developing Possible Solutions ETS1.C: Optimizing the 	 Scale, Proportion, and Quantity Systems and System Models

Water Cycle & Earth's Systems Lesson Flow on Next Page

Ecosystems & The Food Web • Lesson Flow (pg 2 of 2)



Earth & Space Patterns • Unit Summary

In this unit, students explore patterns of the Earth, Sun, Moon, and stars. They investigate how shadows change throughout the day, how the Sun's position changes throughout the year, and how stars change throughout the seasons. They also create Earth, Sun, and Moon models to explore Moon patterns. <u>Assessments</u>

Performance	Science &	Disciplinary	Crosscutting
Expectations	Engineering Practices	Core Ideas	Concepts
• 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.	 Developing and Using Models Using Mathematics and Computational Thinking Planning and Carrying Out Investigations Analyzing and Interpreting Data Engaging in Argument from Evidence Constructing Explanations and Designing Solutions 	• ESS1.B: Earth and the Solar System	• Cause and Effect • Patterns



See Anchor Layer Teacher Guide

See Teacher Guide

Stars & Planets • Unit Summary

In this unit, students explore our solar system! They investigate how bright the Sun appears from each planet in our solar system and from stars of other solar systems in galaxies far away. They also investigate gravity on Earth and gravity on other planets to discover patterns of this incredible force.

Performance	Science &	Disciplinary	Crosscutting
Expectations	Engineering Practices	Core Ideas	Concepts
 5-ESSI-1. Support an argument that differences in the apparent brightness of the Sun compared to other stars is due to their relative distances from Earth. 5-ESSI-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. 	 Developing and Using Models Engaging in Argument from Evidence Planning and Carrying Out Investigations Analyzing and Interpreting Data Using Mathematics and Computational Thinking Obtaining, Evaluating, and Communicating Information 	 ESSI.A: The Universe and its Stars ESSI.B: Earth and the Solar System PS2.B: Types of Interactions 	 Cause and Effect Patterns Scale, Proportion, and Quantity Systems and System Models





Solar System What's the best place to visit in the solar system? In this unit, students investigate the properties of matter by dissolving everyday chemicals to make solutions and by exploring simple yet surprising chemical reactions. Through these investigations, students begin to build conceptual models for the particulate nature of matter.

Performance **Expectations**

Anchor Connection

• 5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen. • 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-PS1-3. Make observations and measurements to identify materials based on their properties. • 5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

Scienc **Engineering Practices**

 Planning and Carrying Out Investigations • Constructing Explanations and

Designing Solutions

Using Mathematics and

Computational Thinking

• Analyzing and Interpreting Data

• Developing and Using Models

Disciplinary Core Ideas	Crosscutting Concepts
• PS1.A: Structure	Cause and Effect
and Properties of	 Scale, Proportion,
Matter	and Quantity
• PS1.B: Chemical	 Energy and Matter
Reactions	



Anchor Connection

gargoyles over time?

ce &	Disciplinary
eering Practices	Core Ideas

Mystery science