

Grade 1

Phenomena Tracker

Museum of Leafology

Blue: SEP Orange: DCI Green: CCC

Anchor Phenomenon: The thistle plants look alike, but not exactly the same.
How are all plants alike and how are they different?

SUMMARY	PERFORMANCE EXPECTATIONS	KEY INVESTIGATIVE PHENOMENA	I CAN... STUDENT LEARNING OBJECTIVES	ANCHOR PHENOMENON TOUCHPOINT
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Driving Question 1: What is a plant?

<p>Students explore what it takes to be a good scientist. Then the young scientists investigate the concept of living and non-living things, with an emphasis on plants. They go outside to photograph plants and then begin an observation experiment by planting some seeds.</p> <p>Teacher Edition</p> <p>Twig Book</p>	<p>Anchor Phenomenon 1-LS3-1, 1-LS1-1</p>	<ul style="list-style-type: none"> Plants, like animals, are living things. 	<ul style="list-style-type: none"> Behave like a scientist to explore and observe living and non-living things. 	<ul style="list-style-type: none"> Students engage with the Anchor Phenomenon by observing patterns in the growth of thistle plants. Then they generate questions about the Anchor Phenomenon (see example in Lesson 3).
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Driving Question 2: How do plants use their parts to grow and survive?

<p>Students start to investigate what plants need and how a plant's parts help it to grow and survive. They begin building the first room in the Museum of Leafology: the Plant Parts Room.</p> <p>Teacher Edition</p> <p>Twig Book</p>	<p>Anchor Phenomenon 1-LS3-1</p>	<ul style="list-style-type: none"> Plants have needs. All plants share common plant parts. Plant parts help plants grow and survive. 	<ul style="list-style-type: none"> Use texts, songs, and poems to gather information about how plant parts help plants to grow. 	<ul style="list-style-type: none"> Students investigate the Anchor Phenomenon by collecting data about similarities and differences between plants (see example in Lesson 2).
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Driving Question 3: How are seeds dispersed?

<p>Students explore the many methods that plants use to distribute seeds away from the parent plant. In teams, students tackle an Engineering Design Challenge to design and build seeds for dispersal by wind. They test and present the results of their design before adding a Seeds Room to the Museum of Leafology.</p> <p>Teacher Edition</p> <p>Twig Book</p>	<p>Driving Question 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</p> <p>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</p> <p>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</p> <p>Anchor Phenomenon 1-LS1-1</p>	<ul style="list-style-type: none"> Plants use different methods to disperse their seeds. The structure of a plant helps it disperse its seeds. 	<ul style="list-style-type: none"> Design a seed model with shapes and features that help it to travel in the wind. 	<ul style="list-style-type: none"> Students investigate and evaluate the Anchor Phenomenon by comparing thistle seeds to the seed models they built in class (see example in Lesson 6).
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How are all plants alike and how are they different?

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Driving Question 4: How are young and adult plants alike and different?				
<p>Students observe the seedlings they planted and record similarities and differences. Then students explore plants in nature, sketching plants they find, focusing on comparing and contrasting young and adult plants of the same type.</p> <p>Teacher Edition</p> <p>Twig Book</p>	<p>Driving Question 1-LS3-1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents</p> <p>Anchor Phenomenon 1-LS3-1, 1-LS1-1</p>	<ul style="list-style-type: none"> • Young and adult plants of the same type are similar but not exactly alike. 	<ul style="list-style-type: none"> • Look at evidence and then make sketches to show how young and adult plants are alike and different. 	<ul style="list-style-type: none"> • Students evaluate the Anchor Phenomenon by comparing and contrasting adult and young plants (see example in Lesson 3). • Students explain the Anchor Phenomenon using evidence of similarities and differences between plants (see example in Lesson 4).
Driving Question 5: What special features do some plants have that help them survive and grow?				
<p>Students investigate the clever strategies plants use to get what they need. They discuss the defenses some plants incorporate, using these ideas to create and sketch their own imaginary plant with special defenses. They make two new rooms for the Museum of Leafology: the Seedlings and Parent Plants Room, and the Amazing Plants Room.</p> <p>Teacher Edition</p> <p>Twig Book</p>	<p>Driving Question 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</p> <p>1-LS3-1 Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents</p>	<ul style="list-style-type: none"> • Plants use strategies to fulfill their needs. • Plants use different defenses to grow and survive. 	<ul style="list-style-type: none"> • Watch videos and read texts to find information • Create drawings and models of plants with special structures and functions. 	

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Driving Question 6: How can plants inspire humans to solve problems?

Students tackle the second Engineering Design Challenge of the module. The first half of the Driving Question provides examples of existing inventions that were inspired by plants. Then, student pairs design, build, and present their own plant-inspired solution to a human problem.

Teacher Edition

Twig Book

Driving Question
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-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

- Engineers use biomimicry to design solutions to human problems.
- Plants can provide inspiration for biomimicry.

- **Observe the structures and functions of plants**
- **Be inspired by plants to design an invention that solves a problem.**

Driving Question 7: How are all plants alike and how are they different?

Students finish preparing the Museum of Leafology, then invite other classes and their own families to visit the museum in order to demonstrate their learning. The final lesson features a pair of assessment tasks and a reading about edible plants, followed by a celebratory plant parts salad.

Teacher Edition

Twig Book

Anchor Phenomenon
1-LS3-1, 1-LS1-1

- All plants are made up of similar parts (roots, stems, leaves, flowers, fruits) that they need to survive and grow, but they often look different.
- Parent plants and their seedlings can look similar in some ways and different in other ways.

- **Give a presentation and describe evidence about plants.**
- Students resolve the Anchor Phenomenon through a class discussion (see example in Lesson 1).



Grade 1

Phenomena Tracker

Animal Reporters

Blue: SEP Orange: DCI Green: CCC

Anchor Phenomenon: A young elephant makes a sound. Then an adult elephant feeds it.
How do animals use their body parts, communicate with their young, and make sounds?

SUMMARY	PERFORMANCE EXPECTATIONS	KEY INVESTIGATIVE PHENOMENA	I CAN... STUDENT LEARNING OBJECTIVES	ANCHOR PHENOMENON TOUCHPOINT
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Driving Question 1: What are animal body parts and how do they use those body parts?

Taking on the role of Animal Reporters, students begin gathering information for an article and use observation to infer from evidence. They focus on structure and function, observing animals and learning vocabulary related to body coverings (skin/fur), how and why animals move, and specialized body parts with unique purposes. Students begin work on an article that documents their investigation of a specific animal.

Teacher Edition

Twig Book

Anchor Phenomenon
1-LS1-2, 1-PS4-1

- Animals share common body parts.
- Animals use their body parts to move, defend themselves, and communicate.

- Read texts and watch videos to make observations about animals and their body parts
- Ask questions, share ideas, and examine evidence to learn about animals
- Use evidence to write an article about animals.

- Students engage with the Anchor Phenomenon by observing patterns of behavior among elephant parents and offspring. Then they generate questions about the Anchor Phenomenon (see example in Lesson 3).

Driving Question 2: How are parents and their young alike and different?

This Driving Question starts with students thinking about animals and their young. Like they did with plants in Module 1, students understand that adult and young animals have similarities and differences. They also learn how young animals of the same type are alike and different from each other.

Teacher Edition

Twig Book

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

- Young and adult animals of the same type are similar but not exactly alike.

- Observe animals to find patterns
- Ask questions to gather evidence.

Driving Question 3: How do animals care for and communicate with their young?

In this Driving Question, the focus moves from comparing adults and young to looking at how the parents care for their young. Students learn what baby animals need and study how the parents meet those needs. They also explore how the young communicate their needs to their parents, focusing on body language. The Driving Question concludes with students writing another segment of their article.

Teacher Edition

Twig Book

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

Anchor Phenomenon
1-LS1-2

- Young animals have needs, which they communicate to their parents.
- Adult animals meet these needs by caring for their young.
- Animals use body language to communicate.

- Observe patterns in animal behavior to learn how they communicate
- Read texts to learn about good writing.

- Students investigate the Anchor Phenomenon by gathering data about how elephants communicate with their young (see example in Lesson 1).
- Students evaluate the Anchor Phenomenon by identifying patterns in animal communication (see example in Lesson 3).

Animal Reporters

Blue: SEP Orange: DCI Green: CCC

Anchor Phenomenon: A young elephant makes a sound. Then an adult elephant feeds it. How do animals use their body parts, communicate with their young, and make sounds?

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Driving Question 4: What makes sound?

Having learned about how animals communicate with body language, students now look at how they communicate with sound. They listen to and classify animal sounds, and learn vocabulary related to sound. Through hands-on investigation, students discover the relationship between sound and vibrations, and learn that the size of the vibration is related to the volume of the sound. At the end of the Driving Question, students finish their articles.

Teacher Edition

Twig Book

Driving Question
1-PS4-1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate
Anchor Phenomenon
1-LS1-2, 1-PS4-1

- Animals use sound to communicate.
- Vibrations produce sound.
- The pitch and volume of a sound can be manipulated.
- The size of the vibration determines the volume of the sound.
- Sound travels through waves.

- **Plan experiments to investigate what causes sound**
- **Use diagrams to demonstrate evidence**
- **Gather evidence to write about how animals use sounds.**

- Students evaluate the Anchor Phenomenon by connecting vibrations and sounds to animal communication (see example in Lesson 4).
- Students explain the Anchor Phenomenon using evidence (see example in Lesson 8).
- Students resolve the Anchor Phenomenon through a class discussion (see example in Lesson 9).

Driving Question 5: How can we use sound to communicate over long distances?

Students take part in an Engineering Design Challenge, in which they must design, refine, build, and test a device that uses sound to communicate a message over a distance. Finally, they create a presentation that describes how well their invention works.

Teacher Edition

Twig Book

Driving Question
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-ETS1-1 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

- Human-made devices can use sound to communicate over long distances.
- Engineers test and iterate their designs to design a solution that best meets their criteria.

- **Work in a team to build a functioning communication device**
- **Ask questions and examine evidence to solve problems.**

Grade 1

Phenomena Tracker

Shadow Town

Blue: SEP Orange: DCI Green: CCC

Anchor Phenomenon: During the fall, even in the daytime, the town of Rjukan is in the dark.
Why is the town of Rjukan in a shadow?

SUMMARY	PERFORMANCE EXPECTATIONS	KEY INVESTIGATIVE PHENOMENA	I CAN... STUDENT LEARNING OBJECTIVES	ANCHOR PHENOMENON TOUCHPOINT
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Driving Question 1: What are shadows and how are they made?

Students are introduced to the Module Anchor Phenomenon: Why is the town of Rjukan in a shadow? They set out to investigate shadows, light and dark, and materials that might solve the problem in Rjukan. They start by exploring what shadows are, how they are formed, and how they can change. They experiment with making shadows, as well as observing and predicting the movement of shadows made by the Sun.

Teacher Edition

Twig Book

Driving Question
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

Anchor Phenomenon
1-PS4-3, 1-PS4-2

- Shadows are produced on surfaces when a light source is blocked by an obstacle.
- Shadows will change if their light source, obstacle, or surface changes.
- Light travels in a straight line.
- Shadows are affected by the movement of the Sun.

- Explore the phenomena of shadows and light
- Describe how shadows are made and how they can change size.

- Students engage with the Anchor Phenomenon by making observations about the town of Rjukan (see example in Lesson 1).
- Students generate questions about the Anchor Phenomenon (see example in Lesson 1).

Driving Question 2: What can we see in the dark?

Students conduct experiments to discover they cannot see if there is no light. They investigate different light sources and discover that light allows them to see. They read texts and watch videos to explore light and dark further.

Teacher Edition

Twig Book

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

Anchor Phenomenon
1-PS4-2, 1-PS4-3

- Light allows humans to see.
- The Sun makes the Earth light during the day and dark at night.

- Plan and carry out investigations to show that we need light to see.

- Students investigate the Anchor Phenomenon by creating models of the town of Rjukan (see example in Lesson 6).

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SUMMARY	PERFORMANCE EXPECTATIONS	KEY INVESTIGATIVE PHENOMENA	I CAN... STUDENT LEARNING OBJECTIVES	ANCHOR PHENOMENON TOUCHPOINT
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Driving Question 3: Which materials let light through or reflect light?

Students investigate materials and how they relate to light (materials can be opaque, translucent, transparent, or reflective). They experiment with and read about reflections. They apply what they have learned to Rjukan's problem and compare their solution to the one that was devised in real life—mirrors on the mountain to reflect the sunlight.

Teacher Edition

Twig Book

Driving Question

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

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

Anchor Phenomenon

1-PS4-2, 1-PS4-3

- Light passes through some materials but not others.
- Materials such as mirrors reflect light.
- All non-light sources reflect light to some extent.

- Explore the phenomena of material properties
- Use models to find a solution to a reflection problem

- Students evaluate the Anchor Phenomenon by discussing the results of their investigation (see example in Lesson 2).
- Students explain the Anchor Phenomenon by writing an informational leaflet on Rjukan for tourists to the town (see example in Lesson 4).
- Students resolve the Anchor Phenomenon by completing informational leaflets (see example in Lesson 5).

Grade 1

Phenomena Tracker

Patterns in the Sky

Blue: SEP Orange: DCI Green: CCC

Anchor Phenomenon: Child A can only see the Sun out of their window in the morning. Child B can only see the Sun out of their window in the afternoon.

What patterns do we observe in the sky?

SUMMARY

PERFORMANCE EXPECTATIONS

KEY INVESTIGATIVE PHENOMENA

I CAN... STUDENT LEARNING OBJECTIVES

ANCHOR PHENOMENON TOUCHPOINT

Driving Question 1: Where is the Sun in the sky at different times?

Students explore their first pattern: that of the Sun's position in the sky. They observe shadows to discern the pattern of the Sun's movement across the sky and make predictions based on their observations. They also listen to an informational text and use a kinesthetic model to discover the cause of day and night.

Teacher Edition

Twig Book

Driving Question
1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted
Anchor Phenomenon
1-ESS1-1, 1-ESS1-2

- The patterns in shadows can tell us about the Sun's position in the sky.
- The Sun causes day and night.
- During the day, the Sun's position appears to move.

- Explore the phenomenon of day and night
- Use shadows to track the position of the Sun
- Make a model to show how the Sun's position changes during the day.

- Students engage with the Anchor Phenomenon by watching a video. Then they generate questions about the Anchor Phenomenon (see example in Lesson 1).
- Students investigate the Anchor Phenomenon by observing a model and organizing their findings (see example in Lesson 3).
- Students evaluate the Anchor Phenomenon by making a model (see example in Lesson 7).

Driving Question 2: How does the amount of daylight vary between seasons?

This Driving Question is the culmination of a year-long project to collect data about when it is light outside and when it is dark. Students analyze their own data, summarize this data as a class, and compare their data with a scientist's year-long data. Students look for patterns, make claims, and write and present a report.

Teacher Edition

Twig Book

Driving Question
1-ESS1-2 Make observations at different times of year to relate the amount of daylight to the time of year
Anchor Phenomenon
1-ESS1-1, 1-ESS1-2

- There is more sunlight in summer than in winter.

- Collect data throughout the year and analyze patterns
- Compare different data sets to learn about daylight and seasons.

- Students explain the Anchor Phenomenon by writing a short paragraph (see example in Lesson 4).

Patterns in the Sky

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Anchor Phenomenon: Child A can only see the Sun out of their window in the morning. Child B can only see the Sun out of their window in the afternoon.

What patterns do we observe in the sky?

SUMMARY	PERFORMANCE EXPECTATIONS	KEY INVESTIGATIVE PHENOMENA	I CAN... STUDENT LEARNING OBJECTIVES	ANCHOR PHENOMENON TOUCHPOINT
<p>Driving Question 3: What are some patterns between the Earth, Moon, Sun, and stars?</p>				
<p>Students turn their attention from the patterns of the Sun to those of the Moon and stars. After learning about the Moon and stars, they use graphic organizers to record similarities and differences between the Sun and other stars; the Sun and the Moon; the Earth and the Sun; and the Earth and the Moon. They read texts to support this learning and write a report as a summative assessment for the module.</p> <p>Teacher Edition Twig Book</p>	<p>Driving Question 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-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted Anchor Phenomenon 1-ESS1-1</p>	<ul style="list-style-type: none"> • The Moon appears to move in predictable patterns in the sky. • The Moon reflects light from the Sun. • The Sun can only be seen during the day. • The Moon can be seen during the day and at night. • The stars can only be seen at night. • The Sun and Moon both rise and set. • The Sun is a star. • Scientists use patterns to make predictions. 	<ul style="list-style-type: none"> • Do an experiment to see if the Moon reflects light • Read and listen to texts to learn about patterns in the motion of the Earth, Moon, Sun, and stars • Write and draw to show what I know about patterns in the sky. 	<ul style="list-style-type: none"> • Students resolve the Anchor Phenomenon by applying what they've learned about the phenomenon to the motion of the Moon (see example in Lesson 5).