Grade 2
Phenomena Tracker

My Journey West

Blue: SEP Orange: DCI Green: CCC

Anchor Phenomenon: We can use models to help us find Ruthie's new home in the San Francisco Bay Area.
How can we understand and describe the land and water on Earth?

SUMMARY	PERFORMANCE EXPECTATIONS	KEY INVESTIGATIVE PHENOMENA	I CAN... STUDENT LEARNING OBJECTIVES	ANCHOR PHENOMENON TOUCHPOINT
Driving Question 1: How can we use models to understand and describe the land?				
Students are introduced to landforms and learn that maps are models of the real world. By creating two-dimensional paper maps and three-dimensional clay models, students learn both how to create a map and how to read one, as well as finding out about symbols. Teacher Edition Twig Book	**Driving Question** 2-ESS2-2 Develop a model to represent the shapes and kinds of land and bodies of water in an area **Anchor Phenomenon** 2-ESS2-2, 2-ESS2-3	• Maps are models of landforms.	• Make a model to show the shape and scale of the land • Read a map to find out information • Describe different landforms.	• Students engage with the Anchor Phenomenon by reading an entry from Ruthie's diary about a place in the San Francisco Bay Area (see example in Lesson 4). • Students generate questions about the Anchor Phenomenon (see example in Lesson 4). • Students investigate the Anchor Phenomenon by identifying the landforms described in Ruthie's diary entry (see example in Lesson 8).
Driving Question 2: Where is water found in a landscape?				
Students focus on the patterns of where water is found in a landscape, how it flows and collects. In addition to learning to spot water on a map, students learn that water can be found in both liquid and solid forms and can change between forms. Teacher Edition Twig Book	**Driving Question** 2-ESS2-2 Develop a model to represent the shapes and kinds of land and bodies of water in an area 2-ESS2-3 Obtain information to identify where water is found on Earth and that it can be solid or liquid **Anchor Phenomenon** 2-ESS2-2, 2-ESS2-3	• Water flows from higher ground, such as a mountain, to lower ground, eventually ending in the sea. • Water freezes into ice at low temperatures. • Water is found in liquid and solid forms on Earth.	• Use models to explore the phenomena of freezing and melting • Identify patterns on a map that show where water is found • Explain the journey of a river • Plan and carry out a scientific investigation.	• Students evaluate the Anchor Phenomenon by making a map of the landforms Ruthie described (see example in Lesson 4).

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Driving Question 3: How can we describe the water around the world?				
This Driving Question widens the focus from landscapes to the entire world. Students learn about oceans and continue to describe patterns of where and in what form water is found. In the process, they continue to practice interpreting maps. Teacher Edition Twig Book	**Driving Question** 2-ESS2-3 Obtain information to identify where water is found on Earth and that it can be solid or liquid **Anchor Phenomenon** 2-ESS2-2, 2-ESS2-3	• There is more water on Earth than land. • Most of the water on Earth is found in the oceans.	• Identify patterns on a world map that show where water is found • Make a bar graph to represent information • Tell the difference between fact and opinion.	• Students explain the Anchor Phenomenon by writing explanations of their maps and what they show (see example in Lesson 4). • Students resolve the Anchor Phenomenon through a class discussion (see example in Lesson 4).
Driving Question 4: How can we use our understanding of maps in our own lives?				
This Driving Question synthesizes students' learning and connects it to their personal experiences. Students explore maps online to discover landforms in their own area. As a final task, they use their learning to find a route between two points on a map, create a model of the landforms along the route, and describe the journey. Teacher Edition Twig Book	**Driving Question** 2-ESS2-2 Develop a model to represent the shapes and kinds of land and bodies of water in an area	• Satellite maps are models that show the land and water in a given area. • Maps can be used to plan routes from one point to another.	• Compare maps and identify what kind of information they show • Use a map to plan the best route for a journey • Write a report about my work.	

Grade 2
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Master of Materials

Blue: SEP Orange: DCI Green: CCC

Anchor Phenomenon: A spaghetti tower can stand up and hold weight until it is put in hot water.

How can we describe materials as different from one another and understand how their properties relate to their use?

SUMMARY	PERFORMANCE EXPECTATIONS	KEY INVESTIGATIVE PHENOMENA	I CAN... STUDENT LEARNING OBJECTIVES	ANCHOR PHENOMENON TOUCHPOINT
Driving Question 1: How are different kinds of materials similar and different?				
Students discover that all things are made of materials, and materials have different properties. Using hands-on exploration, video, and text, students observe, classify, compare, and contrast materials. Students also realize that objects with specific properties can be used for specific purposes. Teacher Edition Twig Book	**Driving Question** **2-PS1-1** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties **Anchor Phenomenon** **2-PS1-1, 2-PS1-2, 2-PS1-4**	• All things are made of materials, and materials have properties. • Different materials have different properties. • Objects can be classified according to the materials they are made of, and their properties.	• Describe objects by their properties • Sort objects into groups based on properties • Compare and contrast the properties of two objects.	• Students engage with the Anchor Phenomenon by watching a video about a spaghetti tower. Then, they generate questions about the Anchor Phenomenon (see example in Lesson 1).
Driving Question 2: How can testing materials help us to understand their properties and how they can be used?				
Students test materials for specific properties: hardness, flexibility, absorbency, and strength. They also discover that there can be varying degrees of a given property. Teacher Edition Twig Book	**Driving Question** **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 **Anchor Phenomenon** **2-PS1-1, 2-PS1-2**	• Material properties can be tested and measured. There can be varying degrees of a given property. • Materials are chosen for a particular purpose based on their properties.	• Test different materials for the properties of hardness, flexibility, absorbency, and strength • Understand that different materials have properties to different degrees • Analyze data from testing to choose the best materials for a specific purpose.	• Students investigate the Anchor Phenomenon by testing cooked and uncooked spaghetti for different properties (see example in Lesson 4). • Students evaluate the Anchor Phenomenon by completing a cause-and-effect graphic organizer relating properties to function (see example in Lesson 5).
Driving Question 3: What materials are best for building a strong structure?				
This Driving Question focuses on selecting a material for a particular purpose: building a structure that won't collapse under weight. Students design and build three towers with different materials and test them to determine which materials are best suited to the purpose. Teacher Edition Twig Book	**Driving Question** **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 **Anchor Phenomenon** **2-PS1-3**	• Engineers develop and use models to test their designs, and identify • materials that are most suitable for a particular purpose.	• Design and build towers out of different materials • Test towers for strength • Write a report about the results of a test.	• Students evaluate the Anchor Phenomenon through a discussion of their spaghetti towers (see example in Lesson 3).

Master of Materials

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Anchor Phenomenon: A spaghetti tower can stand up and hold weight until it is put in hot water.

How can we describe materials as different from one another and understand how their properties relate to their use?

SUMMARY	PERFORMANCE EXPECTATIONS	KEY INVESTIGATIVE PHENOMENA	I CAN... STUDENT LEARNING OBJECTIVES	ANCHOR PHENOMENON TOUCHPOINT
Driving Question 4: How can the properties of materials change?				
The focus shifts from determining observable properties of materials to how material properties can undergo changes, both reversible and irreversible. Through hands-on exploration and videos, students explore changes, and make arguments about whether a given change is reversible or irreversible. Teacher Edition Twig Book	**Driving Question** **2-PS1-4** Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot **Anchor Phenomenon** **2-PS1-4, 2-PS1-1, 2-PS1-2**	• Material properties can undergo changes, some of which are reversible and some of which are irreversible.	• Explore the phenomena of melting and freezing • Give examples of reversible and irreversible changes • Use the terms solid, liquid, melting, and freezing to explain how crayons can be made • Solve a problem involving reversible and irreversible changes.	• Students investigate the Anchor Phenomenon by observing and discussing reversible and irreversible changes (see example in Lesson 1). • Students evaluate the Anchor Phenomenon by determining whether the changes caused by cooking spaghetti are reversible or irreversible (see example in Lesson 5). • Students explain the Anchor Phenomenon using evidence (see example in Lesson 6).
Driving Question 5: How can we use the same materials to make something new?				
Students observe that objects made of smaller pieces can be taken apart and reassembled in different ways. They design and build two different bridges from the same set of materials. Teacher Edition Twig Book	**Driving Question** **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 **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 **Anchor Phenomenon** **2-PS1-4, 2-PS1-1, 2-PS1-2, K-2-ETS1-3**	• Objects made of smaller pieces can be taken apart and reassembled in different ways. Objects are created from multiple different pieces or materials. The same materials can be used to make something new.	• Build two different bridges using the same materials • Test the strength of the bridges • Compare the results of the bridge tests.	• Students resolve the Anchor Phenomenon through a class discussion (see example in Lesson 2).

Grade 2
Phenomena Tracker

Save the Island

Blue: SEP Orange: DCI Green: CCC

Anchor Phenomenon: Tangier Island has changed shape over time.

How do natural processes shape the Earth?

SUMMARY	PERFORMANCE EXPECTATIONS	KEY INVESTIGATIVE PHENOMENA	I CAN... STUDENT LEARNING OBJECTIVES	ANCHOR PHENOMENON TOUCHPOINT
Driving Question 1: How long does it take landscapes to change?				
This Driving Question expands on student knowledge about landforms. Students learn that some changes to landscapes happen quickly, while other changes are slow and continuous. In this context, they study Earth events such as volcanic eruptions, landslides, and glacier valley formation. Students are introduced to Tangier Island and its erosion problem. Teacher Edition Twig Book	**Driving Question** **2-ESS1-1** Use information from several sources to provide evidence that Earth events can occur quickly or slowly **Anchor Phenomenon** **2-ESS1-1**	• Some changes to landforms happen very quickly (such as a landslide), but others happen very slowly and continuously (such as erosion). • Erosion can show us how a landform or landscape has changed over time. • Tangier Island's landscape is changing slowly.	• Explore the phenomenon of erosion • Study images, videos, and texts to understand how different Earth events can change the landscape • Observe that some Earth events happen quickly, and some happen slowly • Use observations and evidence to make a claim.	• Students engage with the Anchor Phenomenon by making observations about the changing shape of Tangier Island. Then they generate questions about the Anchor Phenomenon (see example in Lesson 9). • Students investigate the Anchor Phenomenon by observing maps of Tangier Island and comparing changes over time (see example in Lesson 10).
Driving Question 2: How do water and wind change landscapes?				
This Driving Question delves deeper into the forces that cause erosion. Demonstrations, hands-on investigations, and texts give students a deeper understanding of eroding landscapes; they apply this understanding in order to define the situation on Tangier Island. Teacher Edition Twig Book	**Driving Question** **2-ESS2-1** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land **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 **Anchor Phenomenon** **2-ESS1-1, 2-ESS2-1**	• Ocean waves, wind, and storms all cause erosion.	• Build and observe models to investigate how water and wind can affect landscapes • Use informational texts and videos to discover more about what is causing the problem on the island.	• Students evaluate the Anchor Phenomenon by analyzing the data they gathered in the investigation (see example in Lesson 2). • Students explain the Anchor Phenomenon by writing a newspaper article (see example in Lesson 5).

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Driving Question 3: How can we protect places from erosion by water and wind?				
This Driving Question provides information about eight potential engineering solutions to erosion problems. Students work in teams to research, discuss, and evaluate the solutions. Teacher Edition Twig Book	**Driving Question** **2-ESS2-1** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land **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	• Some problems caused by erosion can be solved by engineering solutions. • Engineering solutions are designed to solve different problems.	• Investigate different solutions that can prevent erosion • Evaluate and compare different engineering solutions • Use information and knowledge to determine which solutions will work for a given scenario.	
Driving Question 4: How can we save Tangier Island?				
Student teams choose the engineering solution they think will work best for Tangier Island. They sketch and build models, and simulate waves to see how effective their solutions are. Finally, teams create posters and present their work. Teacher Edition Twig Book	**Driving Question** **2-ESS2-1** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land 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** **2-ESS1-1, 2-ESS2-1**	• Engineering solutions can help solve the problem of erosion on Tangier Island. • Engineers create models to test and iterate their design solutions.	• Work with a team to build and test an engineering solution model • Create a poster to explain how our engineering solution can help save the island.	• Students resolve the Anchor Phenomenon through a class discussion (see example in Lesson 6).

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A Garden for Life

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Anchor Phenomenon: In this garden, bees are more likely to visit some flowers and butterflies are more likely to visit other flowers.
How do living things in an environment depend on one another and what do they need to grow?

SUMMARY	PERFORMANCE EXPECTATIONS	KEY INVESTIGATIVE PHENOMENA	I CAN... STUDENT LEARNING OBJECTIVES	ANCHOR PHENOMENON TOUCHPOINT
Driving Question 1: How can we compare different habitats?				
This Driving Question prompts students to think about how the types of living things vary from habitat to habitat. Students observe the living things in three habitats (desert, rain forest, farm) using an interactive. They design and execute a study comparing the biodiversity in two areas of their school. Teacher Edition Twig Book	**Driving Question** **2-LS4-1** Make observations of plants and animals to compare the diversity of life in different habitats **Anchor Phenomenon** **2-LS4-1, 2-LS2-2**	• A habitat provides living things with all they need to survive. • Different living things are found in different habitats. • Biodiversity is the variety of living things in a given habitat. • Sampling is a tool scientists use to measure biodiversity.	• Explore the phenomenon of biodiversity • Explain what a habitat is • Compare different habitats • Use the method of sampling to study the biodiversity of a habitat.	• Students engage with the Anchor Phenomenon by observing an image of a garden. Then they generate questions about the Anchor Phenomenon (see example in Lesson 1). • Students investigate and evaluate the Anchor Phenomenon by comparing the diversity of different habitats and completing a graphic organizer (see example in Lesson 6).
Driving Question 2: How can we help the plants in our garden grow?				
Students begin the process of designing a garden habitat for plants and animals. They plan and execute experiments to see if plants need water and light to grow, making predictions, drawing conclusions, and sharing their results with the class. They will apply their findings toward the creation of their garden plan. Teacher Edition Twig Book	**Driving Question** **2-LS2-1** Plan and conduct an investigation to determine if plants need sunlight and water to grow	• Experiments can be designed to answer a question. • Plants need light and water to grow.	• Explore the phenomena of plant needs • Design and carry out a fair investigation • Collect and interpret data about how plants grow • Write and present a report about my investigation.	

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SUMMARY	PERFORMANCE EXPECTATIONS	KEY INVESTIGATIVE PHENOMENA	I CAN... STUDENT LEARNING OBJECTIVES	ANCHOR PHENOMENON TOUCHPOINT
Driving Question 3: How will the plants and animals in our garden depend on each other?				
This Driving Question explores the interdependence of plants and animals (including humans) by investigating pollination in detail. Students discover how the structures of plant and pollinator parts are related to their functions and influence their interactions. Students choose a pollinator and construct a model to show how it pollinates plants. Teacher Edition Twig Book	**Driving Question** **2-LS2-2** Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants **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** **2-LS2-2**	• The living things in a given habitat are interdependent. • Some plants depend on animals to survive and grow. • The structure of something can tell us about its function. • Flowers of different shapes and colors are pollinated by different animals. • Human actions can negatively impact the habitats of pollinators. • Humans can use artificial pollination to pollinate certain plants.	• Explore the phenomenon of interdependence • Explain how plants and animals depend on each other • Use a model to explain how pollination works • Identify which pollinators would be good for different plants.	• Students investigate the Anchor Phenomenon by observing and comparing a bee on one flower and a butterfly on another (see example in Lesson 7). • Students evaluate the Anchor Phenomenon by discussing and writing about how plants and pollinators depend on each other (see example in Lesson 8).
Driving Question 4: How can we design a garden that will help pollinators?				
Students draw on learning from throughout the module to design pollinator gardens. In the final task, they build and present dioramas of their gardens using what they have learned about pollinators, plants, and their habitats. Teacher Edition Twig Book	**Driving Question** **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 **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. **Anchor Phenomenon** **2-LS4-1, 2-LS2-2, 2-LS2-1**	• Gardens can be designed to attract pollinators. • We can use 2-D models to represent 3-D designs.	• Design a garden habitat • Apply my knowledge to my garden design • Use appropriate materials to represent ideas in a model.	• Students explain the Anchor Phenomenon by creating a poster or fact sheet about the best way to design a garden for pollinators (see example in Lesson 2). • Students resolve the Anchor Phenomenon through a class discussion (see example in Lesson 4).