

Module Map

Anchor Phenomenon: Butterfly Survival

Essential Question: How do butterflies survive over time in a changing environment?

Organisms have characteristics that help them survive over time in changing environments.

Concept 1: Fossil Evidence

Focus Question: What do fossils reveal about the past?

Fossils provide evidence of the kinds of organisms that lived long ago and the nature of their environments.

Phenomenon	Student Learning	Texas Essential Knowledge and Skills for Science	English Language Proficiency Standards
Butterfly Survival <i>Phenomenon Question: How long have butterflies survived on Earth?</i>	Butterflies have survived on Earth for millions of years. <ul style="list-style-type: none"> Lesson 1: Develop a class anchor model to show how butterflies survive in their environment. Lesson 2: Create a relative timeline to understand how long butterflies have survived on Earth. 	3.1A	2C
		3.1G	4C
		3.3B	4D
		3.5C	
		3.5D	
		3.12C	
		3.12D	
Butterfly Fossils <i>Phenomenon Question: What can we learn by studying fossils?</i>	Fossils provide information about the organisms that formed them. <ul style="list-style-type: none"> Lesson 3: Analyze and create clay fossil models to understand how fossils form. 	3.1A	2I
		3.1C	
		3.1D	
		3.1E	
		3.1G	
		3.2A	
		3.2B	
		3.3A	
		3.5A	
3.5C			
3.12D			

Phenomenon	Student Learning	Texas Essential Knowledge and Skills for Science	English Language Proficiency Standards
Regional Fossils <i>Phenomenon Question:</i> <i>What can fossils reveal about our region?</i>	Fossils can provide evidence of changes in an environment over time. <ul style="list-style-type: none"> ▪ Lesson 4: Observe regional fossils to learn about the past environment of a region. ▪ Lesson 5: Compare the past environment with the present-day environment to learn that environments can change over time. 	3.1A 3.1D 3.1E 3.1G 3.2B 3.3A 3.3B 3.5A 3.5B 3.12C 3.12D	1D
Describing and Comparing Weather <i>Phenomenon Question:</i> <i>What type of weather conditions do monarch butterflies live in?</i>	Weather conditions in different locations at the same time can be similar or different. <ul style="list-style-type: none"> ▪ Lesson 6: Measure and describe weather conditions in the present-day environment. ▪ Lesson 7: Make and use a wind vane to determine wind direction. ▪ Lesson 8: Analyze data to compare weather conditions in two locations where monarch butterflies live. 	3.1B 3.1C 3.1D 3.1E 3.1F 3.2B 3.5G 3.10A	1A 4F

Phenomenon	Student Learning	Texas Essential Knowledge and Skills for Science	English Language Proficiency Standards
Fossil Evidence <i>Phenomenon Question:</i> <i>What do fossils found near the butterfly fossil reveal about the Florissant area?</i>	Fossils provide evidence of the nature of organisms and environments from long ago. <ul style="list-style-type: none"> ▪ Lesson 9: Observe fossils to learn about the past environment of the Florissant area. ▪ Lesson 10: Observe organisms that live in the Florissant area today to understand that the environment has changed over time. ▪ Lesson 11: Use fossils and weather condition data to describe past environments. 	3.1A 3.1D 3.1E 3.1G 3.2B 3.3A 3.3B 3.3C 3.5A 3.5B 3.5F 3.10A 3.12C 3.12D 3.13A	3E

Concept 2: Suitability to Environment

Focus Question: How do organisms get what they need to survive?

For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. Some animals form groups that help members survive.

Phenomenon	Student Learning	Texas Essential Knowledge and Skills for Science	English Language Proficiency Standards
Suitability <i>Phenomenon Question:</i> <i>Why do plants and animals live where they do?</i>	Organisms are suited to survive in particular environments because of their characteristics. <ul style="list-style-type: none"> ▪ Lesson 12: Describe how a habitat is a system in which all components depend on one another. ▪ Lesson 13: Describe how energy flows through a food chain and predict the effects of changes to a food chain. ▪ Lesson 14: Identify an organism’s characteristics and explain how these characteristics help the organism survive. ▪ Lesson 15: Describe and analyze an organism’s suitability to a particular environment. ▪ Lesson 16: Evaluate an organism’s ability to survive in a particular environment based on the organism’s characteristics. 	3.1A 3.1C 3.1D 3.1E 3.1G 3.2A 3.2B 3.3A 3.3B 3.3C 3.5B 3.5D 3.5E 3.5F 3.12B 3.12C 3.12D 3.13A	3B 4D 4G

Phenomenon	Student Learning	Texas Essential Knowledge and Skills for Science	English Language Proficiency Standards
<p>Animal Groups</p> <p><i>Phenomenon Question:</i> <i>Why do some animals live in groups?</i></p>	<p>Patterns in behavior reveal that living in groups helps animals survive.</p> <ul style="list-style-type: none"> ▪ Lesson 17: Obtain, evaluate, and communicate information about why different animals live in groups. ▪ Lesson 18: Apply knowledge of how organisms' characteristics help them to survive in their environment. 	<p>3.1D</p> <p>3.1E</p> <p>3.1F</p> <p>3.1G</p> <p>3.2B</p> <p>3.3A</p> <p>3.3C</p> <p>3.4A</p> <p>3.5A</p> <p>3.5B</p> <p>3.5D</p> <p>3.5E</p> <p>3.5F</p> <p>3.12B</p> <p>3.13A</p>	<p>4F</p>

Concept 3: Effects of Environmental Change

Focus Question: What happens to organisms when the environment changes?

When an environment changes, the kinds of organisms that live there may change. Some organisms may stay and survive, some may move in or out, and some may die.

Phenomenon	Student Learning	Texas Essential Knowledge and Skills for Science	English Language Proficiency Standards
Surviving Seasonal Changes	Seasonal changes affect the suitability of organisms to their environment, which may cause some organisms to survive less well than others.	3.1A	2E
<i>Phenomenon Question: How do organisms survive seasonal changes?</i>	<ul style="list-style-type: none"> ▪ Lesson 19: Make observations to determine that monarch butterflies migrate in response to seasonal changes in their environment. ▪ Lesson 20: Observe and compare the life cycle stages of different organisms. ▪ Lesson 21: Investigate how other kinds of butterflies survive seasonal changes. ▪ Lesson 22: Describe how seasonal changes cause some animals to migrate and others to hibernate. ▪ Lesson 23: Investigate how seasonal changes cause some plants to become dormant. 	3.1C	3F
		3.1D	
		3.1E	
		3.1G	
		3.2B	
		3.3A	
		3.3B	
		3.4A	
		3.5A	
		3.5B	
		3.5G	
		3.10A	
		3.12A	
		3.12C	
		3.13B	

Phenomenon	Student Learning	Texas Essential Knowledge and Skills for Science	English Language Proficiency Standards
<p>Long-Term Changes in an Environment</p> <p><i>Phenomenon Question:</i> <i>How do long-term changes in an environment affect the organisms that live there?</i></p>	<p>When an environment experiences a long-term change, some organisms will stay and survive, some will move away, some will perish, and other organisms will move to the changed environment.</p> <ul style="list-style-type: none"> ▪ Lesson 24: Analyze the effects of a long-term change in an environment on the organisms that live there. ▪ Lesson 25: Evaluate potential solutions to help organisms survive after a long-term change in an environment. 	<p>3.1A 3.1F 3.1G 3.2B 3.2D 3.3A 3.3B 3.3C 3.4A 3.5A 3.5B 3.5D 3.5F 3.5G 3.12A 3.12C</p>	<p>4G</p>

Application of Concepts

Task	Student Learning	Texas Essential Knowledge and Skills for Science	English Language Proficiency Standards
Engineering Challenge <i>Phenomenon Question:</i> <i>How can we help monarchs survive in a changing environment?</i>	Humans can change an environment to make it more suitable for an organism. ▪ Lessons 26–29: Apply the engineering design process to help monarchs survive in a changing environment.	3.1A 3.1B 3.1C 3.1D 3.1F 3.1G 3.2B 3.2D 3.3A 3.3B 3.3C 3.4A 3.5A 3.5B 3.5D 3.5F 3.12B 3.12C 3.13A	3E 4C

Task	Student Learning	Texas Essential Knowledge and Skills for Science	English Language Proficiency Standards
End-of-Module Socratic Seminar, Assessment, and Debrief <i>Essential Question: How do butterflies survive over time in a changing environment?</i>	Organisms have characteristics that help them survive over time in changing environments. <ul style="list-style-type: none"> ▪ Lesson 30: Explain how organisms survive over time in changing environments. (Socratic Seminar) ▪ Lesson 31: Explain how organisms survive over time in changing environments. (End-of-Module Assessment) ▪ Lesson 32: Explain how organisms survive over time in changing environments. (End-of-Module Assessment Debrief) 	3.1E 3.1F 3.1G 3.2B 3.3A 3.3B 3.3C 3.5A 3.5B 3.5F 3.5G 3.10A 3.12A 3.12B 3.12C 3.12D 3.13A 3.13B	3E 3F

Focus Standards*

Texas Essential Knowledge and Skills for Science

- 3.1 Scientific and engineering practices. The student asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. The student is expected to
- 3.1A *ask questions and define problems based on observations or information from text, phenomena, models, or investigations;*
 - 3.1B *use scientific practices to plan and conduct descriptive investigations and use engineering practices to design solutions to problems;*
 - 3.1C *demonstrate safe practices and the use of safety equipment during classroom and field investigations as outlined in Texas Education Agency–approved safety standards;*
 - 3.1D *use tools, including hand lenses; metric rulers; Celsius thermometers; wind vanes; rain gauges; graduated cylinders; beakers; digital scales; hot plates; meter sticks; magnets; notebooks; Sun, Earth, Moon system models; timing devices; materials to support observation of habitats of organisms such as terrariums, aquariums, and collecting nets; and materials to support digital data collection such as computers, tablets, and cameras, to observe, measure, test, and analyze information;*
 - 3.1E *collect observations and measurements as evidence;*
 - 3.1F *construct appropriate graphic organizers to collect data, including tables, bar graphs, line graphs, tree maps, concept maps, Venn diagrams, flow charts or sequence maps, and input-output tables that show cause and effect; and*
- 3.1G *develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem.*
- 3.2 Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. The student is expected to
- 3.2A *identify advantages and limitations of models such as their size, scale, properties, and materials;*
 - 3.2B *analyze data by identifying any significant features, patterns, or sources of error; and*
 - 3.2D *evaluate a design or object using criteria.*
- 3.3 Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to
- 3.3A *develop explanations and propose solutions supported by data and models;*
 - 3.3B *communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and*
 - 3.3C *listen actively to others' explanations to identify relevant evidence and engage respectfully in scientific discussion.*

* The bold text identifies standards that students should master in this module. The italicized text identifies standards that students will develop knowledge of throughout the year or will master in later modules. Italicized standards may appear as part of the assessments in this module.

- 3.4 Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation for society. The student is expected to
- 3.4A *explain how scientific discoveries and innovative solutions to problems impact science and society.*
- 3.5 Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. The student is expected to
- 3.5A *identify and use patterns to explain scientific phenomena or to design solutions;*
- 3.5B *identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems;*
- 3.5C *use scale, proportion, and quantity to describe, compare, or model different systems;*
- 3.5D *examine and model the parts of a system and their interdependence in the function of the system;*
- 3.5E *investigate the flow of energy and cycling of matter through systems;*
- 3.5F *explain the relationship between the structure and function of objects, organisms, and systems; and*
- 3.5G *explain how factors or conditions impact stability and change in objects, organisms, and systems.*
- 3.10 Earth and space. The student knows that there are recognizable processes that change Earth over time. The student is expected to
- 3.10A **compare and describe day-to-day weather in different locations at the same time, including air temperature, wind direction, and precipitation.**
- 3.12 Organisms and environments. The student describes patterns, cycles, systems, and relationships within environments. The student is expected to
- 3.12A **explain how temperature and precipitation affect animal growth and behavior through migration and hibernation and plant responses through dormancy;**
- 3.12B **identify and describe the flow of energy in a food chain and predict how changes in a food chain** such as removal of frogs from a pond or bees from a field **affect the ecosystem;**
- 3.12C **describe how natural changes to the environment such as floods and droughts cause some organisms to thrive and others to perish or move to new locations; and**
- 3.12D **identify fossils as evidence of past living organisms and environments, including common Texas fossils.**
- 3.13 Organisms and environments. The student knows that organisms undergo similar life processes and have structures that function to help them survive within their environments. The student is expected to
- 3.13A **explore and explain how external structures and functions of animals** such as the neck of a giraffe or webbed feet on a duck **enable them to survive in their environment; and**
- 3.13B **explore, illustrate, and compare life cycles in organisms** such as beetles, crickets, radishes, or lima beans.

English Language Proficiency Standards

- 1A *Use prior knowledge and experiences to understand meanings in English.*
- 1D *Speak using learning strategies such as requesting assistance, employing non-verbal cues, and using synonyms and circumlocution (conveying ideas by defining or describing when exact English words are not known).*
- 2C *Learn new language structures, expressions, and basic and academic vocabulary heard during classroom instruction and interactions.*
- 2E *Use visual, contextual, and linguistic support to enhance and confirm understanding of increasingly complex and elaborated spoken language.*
- 2I *Demonstrate listening comprehension of increasingly complex spoken English by following directions, retelling or summarizing spoken messages, responding to questions and requests, collaborating with peers, and taking notes commensurate with content and grade-level needs.*
- 3B *Expand and internalize initial English vocabulary by learning and using high-frequency English words necessary for identifying and describing people, places, and objects, by retelling simple stories and basic information represented or supported by pictures, and by learning and using routine language needed for classroom communication.*
- 3E *Share information in cooperative learning interactions.*
- 3F *Ask and give information ranging from using a very limited bank of high-frequency, high-need, concrete vocabulary, including key words and expressions needed for basic communication in academic and social contexts, to using abstract and content-based vocabulary during extended speaking assignments.*
- 4C *Develop basic sight vocabulary, derive meaning of environmental print, and comprehend English vocabulary and language structures used routinely in written classroom materials.*
- 4D *Use prereading supports such as graphic organizers, illustrations, and pretaught topic-related vocabulary and other prereading activities to enhance comprehension of written text.*
- 4F *Use visual and contextual support and support from peers and teachers to read grade-appropriate content area text, enhance and confirm understanding, and develop vocabulary, grasp of language structures, and background knowledge needed to comprehend increasingly challenging language.*
- 4G *Demonstrate comprehension of increasingly complex English by participating in shared reading, retelling or summarizing material, responding to questions, and taking notes commensurate with content area and grade level needs.*

Lessons 1–2

Butterfly Survival

Prepare

Lesson 1 begins by eliciting student understanding of butterflies and their environment to lay the groundwork for exploring the Essential Question: **How do butterflies survive over time in a changing environment?** Students are introduced to various components of an environment where butterflies might be found today and develop an initial anchor model to record their current understanding of what butterflies need to survive. In Lesson 2, students observe a butterfly fossil and create a relative timeline that represents the elapsed time between Earth’s formation and the present day to better understand when the earliest butterflies appeared on Earth. Students then develop a driving question board based on their questions about butterflies. These questions guide student learning throughout the rest of the module.

Student Learning

Knowledge Statement

Butterflies have survived on Earth for millions of years.

Objectives

- Lesson 1: Develop a class anchor model to show how butterflies survive in their environment.
- Lesson 2: Create a relative timeline to understand how long butterflies have survived on Earth.

Concept 1: Fossil Evidence

Focus Question

What do fossils reveal about the past?

Phenomenon Question

How long have butterflies survived on Earth?

Standards Addressed

Texas Essential Knowledge and Skills

Content Standards

Standard	Student Expectation	Lesson(s)
3.12C	Describe how natural changes to the environment such as floods and droughts cause some organisms to thrive and others to perish or move to new locations. (Introduced)	1, 2
3.12D	Identify fossils as evidence of past living organisms and environments , including common Texas fossils. (Introduced)	2

Scientific and Engineering Practices

Standard	Student Expectation	Lesson(s)
3.1A	Ask questions and define problems based on observations or information from text , phenomena, models , or investigations.	1, 2
3.1G	Develop and use models to represent phenomena, objects , and processes or design a prototype for a solution to a problem.	1
3.3B	Communicate explanations and solutions individually and collaboratively in a variety of settings and formats .	2

Recurring Themes and Concepts

Standard	Student Expectation	Lesson(s)
3.5C	Use scale, proportion, and quantity to describe, compare , or model different systems.	2
3.5D	Examine and model the parts of a system and their interdependence in the function of the system .	1

English Language Proficiency Standards

Standard	Student Expectation	Lesson(s)
2C	Learn new language structures, expressions, and basic and academic vocabulary heard during classroom instruction and interactions.	1, 2
4C	Develop basic sight vocabulary, derive meaning of environmental print, and comprehend English vocabulary and language structures used routinely in written classroom materials.	1, 2
4D	Use prereading supports such as graphic organizers, illustrations, and pretaught topic-related vocabulary and other prereading activities to enhance comprehension of written text.	1

Materials

Student Materials	Lesson(s)
Science Logbook (Lesson 1 Activity Guide)	1
Organism cards (1 set per group)	1
Colored pencils (several colors, optional)	1
Personal whiteboard or printer paper (1 sheet)	2
Science Logbook (Lesson 2 Activity Guide, Module Question Log)	2
Event cards (1 set per student pair)	2
Sticky note (1)	2

Teacher Materials	Lesson(s)
Rhinoceros Woodcut and Photograph (Lesson 1 Resource A)	1
<i>A Butterfly Is Patient</i> (Aston and Long 2015)	1
Chart paper (2 sheets), marker (1)	1, 2
Butterfly Fossil Photograph (Lesson 2 Resource B)	2
Class timeline: string (enough to create one 3 m piece), scissors (1), index cards (10), marker (1), tape measure (1), clothespins (10) or tape	2

Teacher Preparation	Lesson(s)
Prepare organism cards. (See Lesson 1 Resource B.)	1
Prepare string for class timeline. (See Lesson 2 Resource A.)	2
Prepare event cards. (See Lesson 2 Resource C.)	2

Lesson 1

Objective: Develop a class anchor model to show how butterflies survive in their environment.

Launch 10 minutes

Display *The Rhinoceros* by Albrecht Dürer (Lesson 1 Resource A).



► What do you notice about the animal in this picture?

- It has a shell on its body and scales on its legs.
- It looks like it has a unicorn horn on its back.
- It looks kind of like a rhinoceros, but it looks different from the ones I have seen at the zoo.

Agenda

Launch (10 minutes)

Learn (30 minutes)

- Create a Butterfly Drawing (10 minutes)
- Define Organisms and Environments (12 minutes)
- Develop an Anchor Model (8 minutes)

Land (5 minutes)

Show students a photograph of a rhinoceros (Lesson 1 Resource A).



▶ What does seeing this picture make you think about the first picture?

- *I think this picture looks more like a real rhinoceros than the first one.*
- *There are a lot of details in the first picture, but they don't show what a rhinoceros actually looks like.*


Tell students that both pictures are meant to depict a rhinoceros, and ask them to compare the two pictures more closely.

▶ What is similar about the two pictures? What is different?

- *Both pictures show a rhinoceros.*
- *Both rhinoceroses have four legs and two ears.*
- *Both pictures show a rhinoceros with two horns, but the horns are not in the same place.*
- *The rhinoceros's skin looks more scaly and rougher in the first picture than it does in the second picture.*

▶ What might explain the differences between the two pictures?

- *They might be different because one is a drawing and the other is a photograph.*
- *Maybe they show two different kinds of rhinoceros.*
- *Maybe the person drawing the picture wasn't looking at a real rhinoceros.*

Reveal to students that the first picture shows a woodcut created by an artist named Albrecht Dürer in 1515.  Explain to students that Dürer had never seen a rhinoceros, but that he created the woodcut based on a letter he received that included a description and a sketch of a rhinoceros (MacGregor 2014).

► **Why do you think the woodcut does not accurately show what a real rhinoceros looks like?**

- *I think it would be really hard to draw something without seeing it before.*
- *The details would be hard to draw without ever seeing a real rhinoceros.*

Tell students that for hundreds of years many people who had never seen a rhinoceros saw prints made by using Dürer's woodcut and thought that the prints showed an accurate representation of the animal.

► **What do you think is problematic about people believing that Dürer's woodcut showed an accurate representation of a rhinoceros?**

- *People thought this was what a rhinoceros looked like, but it wasn't.*
- *People didn't know what a rhinoceros actually looked like.*

Ask students to keep the importance of accurate representation in mind as they participate in the rest of the lesson.

Learn 30 minutes

Create a Butterfly Drawing 10 minutes

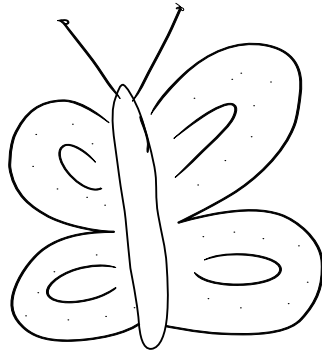
Ask students to use what they know about butterflies to draw a butterfly in their Science Logbook (Lesson 1 Activity Guide). Allow students to use colored pencils, if available, for their drawings.



Teacher Note

A woodcut is made when an artist carves a picture into the surface of a block of wood. The artist applies ink to the raised surface of the wood block and presses the surface against a piece of paper to create an image on the paper. Comparing a woodcut to a rubber stamp may help students understand its purpose.

Sample student response:



After students have finished their butterfly drawings, ask them to share their drawings with a partner. Students should discuss the similarities and differences between their drawings and make changes to their drawings to add any new details they would like to include. Ask students to share with the class the similarities and differences they discussed with their partner.

▶ **What did your butterfly drawings have in common?**


- *Both of our butterflies had wings.*
- *Our butterflies both had a body with two lines coming out of the top.*

▶ **How were your butterfly drawings different?**


- *Our butterflies were different colors.*
- *The shape of their wings was different.*
- *My partner included eyes on the butterfly, but I didn't.*

▶ **How did you know what to include on your drawing?**

- *I've seen butterflies fly, so I know they have wings.*
- *I know butterflies have two antennae because I've seen them in my mom's garden.*

Introduce students to the book *A Butterfly Is Patient* (Aston and Long 2015). Before reading, display the front and back covers of the book.  Give students a few moments to observe the covers silently, and then ask the following questions.

- ▶ What do you think this book is about? Why do you think that?

Display pages 29 and 30, and ask students to compare the illustrations of the butterflies in the book with their butterfly drawings. 

- ▶ How do the butterfly illustrations in the book differ from the butterfly you drew?
 - *The butterflies in the book are much more detailed.*
 - *My butterfly doesn't have legs or lines coming out of its head like the ones in the book.*
 - *There aren't any butterflies that look exactly like the one I drew.*

Inform students that **butterflies** are insects that have long, thin bodies and four wings that are often brightly colored. Ask students to look at their drawings and determine whether their butterflies have these structures.




English Language Development

Introduce the term *butterfly* explicitly by using strategies such as these:

- Pronounce the word *butterfly* and have students repeat it.
- Say in syllables but-ter-fly, and then repeat the full word.
- Consider showing students images of different butterflies.

After introducing this and other important terms, provide scaffolds for English learners as they use the words when speaking, writing, and investigating. For more information on language scaffolds, see the English Language Development section of the Implementation Guide (2C).

Allow students time to make additional changes to their butterfly drawings. Encourage students to include more details and to make more accurate representations of the animal. 



Teacher Note

Observing front and back covers of a book helps students formulate ideas about the book's content. Provide additional prereading supports and activities as needed to enhance student comprehension of the text (4D).



Teacher Note

A Butterfly Is Patient does not include page numbers. Consider writing small page numbers in the text or using sticky tabs to mark pages to easily locate where readings should begin throughout the module. The illustrations shown during this lesson are on pages 29–30, which include multiple labeled butterfly illustrations.



Teacher Note

It is not necessary for students' butterfly drawings to have the same wing patterns or colors as the butterflies shown in the book. Students should instead focus on accurately representing details such as number of antennae, body shape, and number of wings.

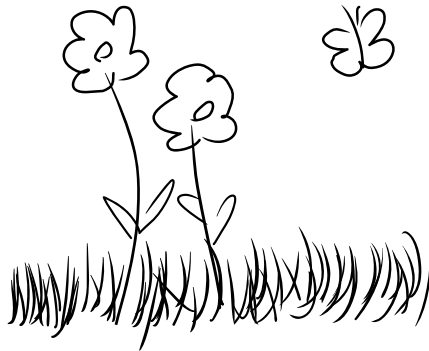
- ▶ Imagine that you are going to show your butterfly drawing to someone who has never seen a butterfly before. Would your drawing tell the person everything there is to know about butterflies? What kind of information would the person not be able to tell from your drawing?
 - They wouldn't know anything about where a butterfly lives and what it eats.
 - They wouldn't be able to tell how a butterfly moves.
 - They wouldn't be able to tell how big a butterfly is.

Agree that there is a lot about butterflies that a person would not be able to tell just from looking at a drawing of a butterfly. Highlight student responses related to where butterflies live or what butterflies need to survive.

Define Organisms and Environments 12 minutes

Ask students to create another drawing to show what they know about where butterflies live (Lesson 1 Activity Guide).

- ▶ What does a butterfly need to survive? Imagine things you might see where a butterfly lives. Draw a picture. 🎨



Ask students to share with the class the components they included in their drawings. 📄



English Language Development

The word *survive* is used frequently in this module. Providing the Spanish cognate *sobrevivir* may be useful. Provide the meaning of the word in alternate contexts by using guiding questions such as these to scaffold conversations (2C):

- What do you need to survive?
- What does a plant need to survive?




Teacher Note

At this point in the lesson, students should record initial ideas about the environment of a butterfly and what a butterfly needs from its environment. It is acceptable for students to include only a few components of the environment in their drawing.

Sample student response:

- *I included a butterfly with flowers and grass.*

Divide the class into small groups. Tell students that they will work with their group to observe photographs to learn more about where butterflies live.

Distribute a set of organism cards (Lesson 1 Resource B) to each group. Ask students to sort the cards into categories of their choice. Tell students that the cards in each category should be related and that they must be able to justify why they grouped the cards the way they did.  After providing students a few minutes to sort the cards, ask for volunteers from each group to share the categories they came up with.

Sample student responses:

- *We sorted the cards into plants and animals.*
- *We sorted the cards into things that can fly and things that can't fly.*
- *We sorted the cards based on where the plants and animals live. We have a land category and a water category.*

Ask students in each group to put all their cards back into one pile. Challenge students to think of a single category that includes all the cards.

▶ **What would you title this category?** 

- *Things that are found outside*
- *Things that need water*
- *Things that are living*

Tell students that scientists use the term **organism** to describe all living things, including all plants and animals. Suggest that students use this term as a title for a category that includes all the cards, and point out that each card shows at least one organism.

Remind students of the butterfly they drew in their Science Logbook (Lesson 1 Activity Guide) to show where a butterfly lives. Tell students that the organisms they observed in the card sort activity are all organisms that can be found where butterflies live. Allow students time to update their drawing with any new organisms they think may help butterflies survive.



Differentiation

Some students may need support sorting the cards into categories. Consider prompting students with questions such as the following:

- Do you notice any similarities among any of the cards?
- Do you notice any major differences among the cards that you can use to separate them into groups?



Content Area Connection: English

This card categorization reinforces the writing skill of grouping related information. Deepen this connection by prompting students to explain their choices by using a question such as the following: Why does this card belong in this category?

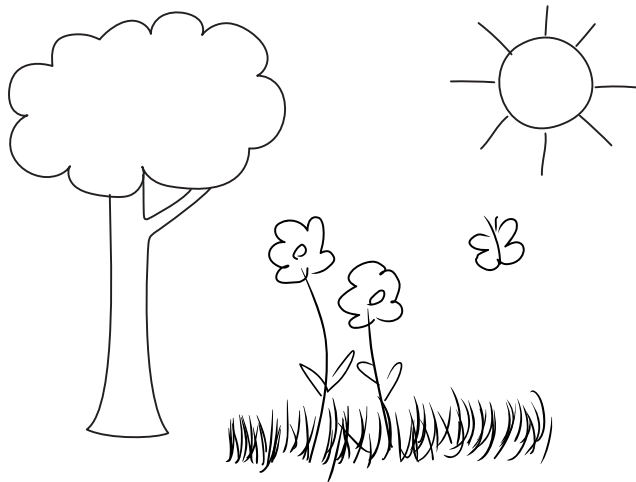
Tell students that their drawings represent part of a butterfly's **environment**, or the area surrounding an organism that includes what the organism needs to survive. Explain that students' drawings include organisms that live around the butterfly and that these organisms provide some of what butterflies need.

▶ **What else do you think butterflies need to survive?** 🦋

- *I think butterflies also need water.*
- *Maybe butterflies need sunlight to stay warm.*

Confirm that an organism's environment includes both the living and nonliving things that surround the organism and that organisms need both living and nonliving things to survive. Invite students to update their drawings with nonliving things (e.g., water, sunlight) they think butterflies might need.

Sample student response:



English Language Development

Introduce the terms *organism* and *environment* explicitly. Providing the Spanish cognate *organismo* (*organism*) may be useful (2C).

Then ask students to Jot–Pair–Share in their Science Logbook (Lesson 1 Activity Guide) in response to the following question.



Spotlight on Knowledge and Skills

To review student learning from Levels 1 and 2, consider having students identify living and nonliving things in a butterfly's environment as students share the basic needs of a butterfly. Record student responses on a chart with columns labeled Living and Nonliving (1.12A, 2.12A, 4C).

► **What is the difference between an organism and an environment?**

- *An organism is a living thing. An organism can be a plant or an animal. An environment is where an organism lives. It is all of the living and nonliving things around the organism.*
- *An organism is just one living thing, but I think an environment has a lot of living things. I think organisms can be a part of an environment.*



Check for Understanding

This task is a pre-assessment. Use students' responses to gauge their prior understanding of the components needed in a butterfly's environment.

TEKS Assessed	
3.1G	Develop and use models to represent phenomena, objects , and processes or design a prototype for a solution to a problem.
3.5D	Examine and model the parts of a system and their interdependence in the function of the system.
3.12C	Describe how natural changes to the environment such as floods and droughts cause some organisms to thrive and others to perish or move to new locations.

Evidence	Next Steps
Look for evidence that students include basic components of a butterfly's environment (3.12C) (e.g., flowering plants, grass, trees, water) (3.5D) in their models (3.1G).	It is not necessary for students to fully identify or understand all the components of a butterfly's environment at this point. If students need support identifying any key components of a butterfly's environment, consider displaying photographs of butterflies in their environment.

Develop an Anchor Model 8 minutes

Explain to students that they will now develop an anchor model to demonstrate an understanding of how butterflies survive in their environment.

Begin by asking students to review their drawings of a butterfly's environment in their Science Logbook (Lesson 1 Activity Guide). Ask students what components of their drawings they believe should be included in the anchor model. As students share components, ask the rest of the class to use nonverbal signals to indicate whether they agree that the component represents part of a butterfly's environment that helps it survive. If most students agree with adding a component and can justify its inclusion, then draw it on the anchor model.

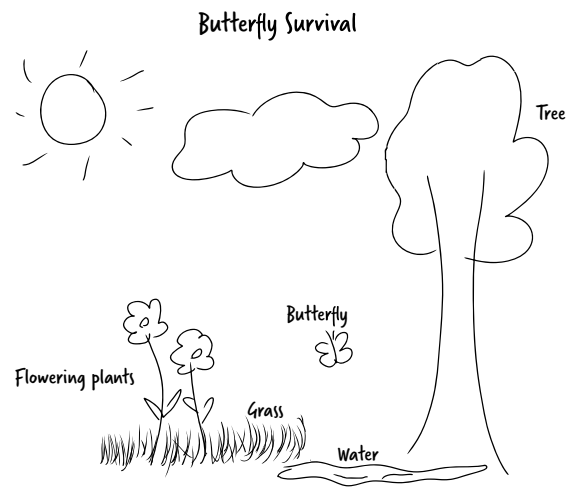
Anchor models will vary, but most should include the following components:

- Flowering plants
- Other plants (trees, grass)
- Water source

Depending on the class discussion, anchor models may also include additional components, such as other animals.

Include a title and an explanation on the anchor model.

Sample anchor model:



Butterflies live in environments that have water and plants such as flowering plants, grass, and trees. Butterflies get what they need to survive from their environment.

When the class anchor model is complete, use it to guide students' learning throughout the module.

Land

5 minutes

Draw students' attention to the anchor model, and ask them to consider what questions they have about butterflies and what they still want to know. Instruct students to record their questions in their Science Logbook (Lesson 1 Activity Guide).

Sample student responses:

- *Do all butterflies look the same?*
- *Do butterflies always live in areas with flowers, grass, and water?*
- *Why don't butterflies live everywhere?*
- *What is the weather like where butterflies live?*

Next, ask students to share what they know about other organisms and what these organisms need to survive.

- ▶ **You have identified some of the living and nonliving things that butterflies need in their environment. What do you know about other organisms and what they need in their environments?**
 - *I have a pet horseshoe crab. It needs sand to live in and worms to eat.*
 - *Elephants need a lot of space because they are really big. Elephants I have seen at the zoo eat hay and grass and have water to drink.*
 - *My favorite animal is a dolphin. It needs water to live in and fish to eat.*

Add student responses to the bottom of the piece of chart paper that will be used for the driving question board. Label the section Related Phenomena. This student-generated list of phenomena should be referred to throughout the module and can be added to any time relevant, related phenomena are suggested.

Optional Homework

Students share what they learned about butterfly environments with an adult and consider whether the area around where they live has any of the things a butterfly might need to survive.

