

Learning Objectives

Students will:

- use context clues to determine the meaning of unknown words in the text.
- write an informative paragraph to explain how energy moves through an ecosystem.
- use a solar oven to demonstrate how the sun's energy can be captured.

Standards

- **Reading:** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.
- **Writing:** Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
- **Content:** Use models to describe that energy in animals' food was once energy from the sun.
- **Language:** Communicate information, ideas, and concepts necessary for academic success in the content area of Science.

Lesson Timeline

<p>Day 1</p> <p>Task</p> <p>Introductory and Lab Activities (page 40)</p> <p>Summary of Student Learning Activities</p> <p>Use the sun's energy to cook food.</p>	<p>Day 2</p> <p>Task</p> <p>Before Reading (page 41)</p> <p>Summary of Student Learning Activities</p> <p>Ask questions about the text prior to reading.</p>	<p>Day 3</p> <p>Task</p> <p>During Reading (page 42)</p> <p>Summary of Student Learning Activities</p> <p>Use context clues to determine the meanings of words, and write an informative paragraph.</p>
<p>Day 4</p> <p>Task</p> <p>After Reading (page 43)</p> <p>Summary of Student Learning Activities</p> <p>Write sentences with context clues.</p>	<p>Day 5</p> <p>Task</p> <p>Activity from the Book (page 43) and Assessments (pages 48–49)</p> <p>Summary of Student Learning Activities</p> <p>Observe and record signs of energy, and take the assessments.</p>	



Materials

- Solar Cooking activity sheet (page 44)
- thin cardboard box, such as a pizza box
- box-cutter knife (adult use only)
- aluminum foil
- black paper
- plates
- rulers
- tape
- food to cook
- plastic wrap

Day 1

Use the sun's energy to cook food.

Introductory Activity

Engage

1. Ask students to think of a time when they experienced the sun's energy, such as touching hot cement on a sunny day.
2. Tell students that they will learn about one way to capture and use the sun's energy.

Lab Activity

Explore & Explain

1. Before the activity, prepare the boxes by cutting a flap. Along the top of the box, use the box-cutter to cut three sides of the flap. Fold the flap back so it stands up when the lid of the box is closed. **Note:** You may wish to reference the diagrams on page 29 of the *Life and the Flow of Energy* book.
2. Place students in small groups. Distribute a precut box, aluminum foil, black paper, a plate, a ruler, tape, food, and plastic wrap to each group. **Note:** Select food that is safe when uncooked such as hot dogs.
3. Have students tightly wrap foil around the inside of the flap, and then tape the foil to the back of the flap.
4. Have students open the box and tape a layer of plastic wrap over the opening in the lid to seal out the air.
5. Have students place black paper on the bottom of the box and place a plate of food on top of the paper. Have them close the box lid, but prop the flap open with a ruler. Have students direct their boxes toward the sun on a sunny day.
6. Distribute copies of the *Solar Cooking* activity sheet (page 44) to students. Have them record their observations on the activity sheet. **Note:** The food and the box will be hot. **STEM**
7. Ask questions to guide students to the idea that the oven captures the sun's energy to heat the food.
 - *What do you notice about the temperature of the box and the food?*
 - *What type of energy is cooking the food?*
 - *How does the box capture and use the sun's energy?*
8. Clarify misconceptions by having students explain their understandings using logic and evidence to support their ideas.



Materials

- *Life and the Flow of Energy* books
- copies of the *Previewing Questions* activity sheet (page 45)

Day 2

Ask questions about the text prior to reading.

Vocabulary Word Bank

- chlorophyll
- decomposers
- ecosystems
- interdependence
- nutrients
- photosynthesis

Before Reading

Elaborate

1. Write the vocabulary words on the board, and discuss their definitions as a class. Challenge students to sort the words into categories. Discuss each grouping with students and their rationale behind it. Then, have students sort the words a second time using different categories. Allow time for them to share their categories with the class. Discuss any types of groupings students may not have mentioned.
2. Show students the cover of the *Life and the Flow of Energy* book. Discuss the title and its meaning. Explain to students that asking and answering questions about the text prior to reading can help a reader think more critically about the book.
3. As a class, preview the images in the book. Point out any words in bold or italics. Discuss students' prior knowledge of the words, their meanings, and the context in which they are commonly used.
 - You may wish to have students digitally annotate the PDF of the text during this text walk.
4. Distribute copies of the *Previewing Questions* activity sheet (page 45) to students. Have students write questions they have about energy and the book. Challenge them to ask questions about interesting or challenging words.
 - Before the activity, review question words such as, *who*, *what*, *when*, *where*, *why*, and *how* with **below-level learners** and **English language learners**.

Day 3

Use context clues to determine the meanings of words, and write an informative paragraph.

Materials

- *Life and the Flow of Energy* books
- copies of the *Using Context* activity sheet (page 46)

During Reading

Elaborate

1. Distribute the *Life and Flow of Energy* books to students. Review the questions students had prior to reading. Read the book aloud as students follow along. Pause periodically to model how to use different types of context clues such as synonyms, antonyms, definitions in the text, and examples included in the text. For example, after reading page 10, discuss how the definition of *visible spectrum* is given in the text.
 - You may choose to display the Interactiv-eBook for a more digitally enhanced reading experience.
2. Have students read in pairs for the second reading of the book. Distribute copies of the *Using Context* activity sheet (page 46) to students. Have students write interesting or challenging words and the context clues that helped them derive their meanings.
 - For **below-level learners** and **English language learners**, you may choose to play the audio recording as students follow along to serve as a model of fluent reading. This may be done in small groups or at a listening station. The recordings will help struggling readers practice fluency and aid in comprehension.
 - Challenge **above-level learners** to identify the type of context clue they used each time.
3. Ask students to think about the text, and choose one example of how the sun provides energy to animals. Tell students that they will write an informative paragraph to teach others how energy flows through an ecosystem.
4. Model how to begin writing with a main idea sentence. Review the idea that the other sentences will explain and support the main idea. Show students how to use ideas from the text to add details to the writing. Then, have students complete their own paragraphs on separate sheets of paper.



Materials

- *Life and the Flow of Energy* books
- copies of the *Types of Clues*, *Life and Flow of Energy Quiz*, and *Solar Intensity* activity sheets (pages 47–49)

Days 4&5

Write sentences with context clues. Observe and record signs of energy, and take the assessments.

After Reading

Elaborate & Evaluate

1. Write the vocabulary words on the board, and review their definitions. Then, have students write a riddle for each of the words. For example, a riddle for the word *photosynthesis* may be, “I am the process through which plants make their own food. What am I?” Have students mingle, taking turns saying their riddles and guessing the correct answer. Tell students that they must meet with five people before sitting down.
2. Remind students that one way to determine the meanings of unknown words while reading is to use context clues. Review the four types of context clues: synonyms, antonyms, definitions included in the text, and examples in the text.
3. Distribute copies of the *Types of Clues* activity sheet (page 47) to students. Have students complete the activity sheet. Have students talk with a partner to brainstorm ideas for sentences, if needed. Once students are finished, discuss their responses as a class.

Activity from the Book

Read the Your Turn! prompt aloud from page 32 of the *Life and the Flow of Energy* book. Have students record signs of energy that they observe and share them with the class.

1. A short posttest, *Life and the Flow of Energy Quiz* (page 48), is provided to assess student learning from the book.
2. A data analysis activity, *Solar Intensity* (page 49), is provided to assess students’ understanding of how to analyze scientific data. Explain that the chart shows the intensity of the light from the sun during different parts of the day. **Note:** You may need to preteach the skill of reading a line graph before giving this assessment.
3. The Interactiv-eBook activities may be used as a form of assessment (optional).

STEM

Name: _____ Date: _____

Solar Cooking STEM

Directions: Write the food you will cook. Record the total cooking time and your observations. Then, answer the questions after the food has cooked.

Food	Total Cooking Time
Observations	

1 What happened to the food?

2 What do you think caused this?



Name: _____ Date: _____

Previewing Questions

Directions: Write five questions you have about energy or the book.

- 1 _____

- 2 _____

- 3 _____

- 4 _____

- 5 _____



Name: _____ Date: _____

Using Context

Directions: As you read, record interesting or challenging words from the text. Then, write what you think they mean and the context clues that helped you.

Word	Meaning	Context Clue



Name: _____ Date: _____

Types of Clues

Directions: Write five original sentences that use context clues. Use at least two different types of context clues in your sentences. Underline the words that the context clues will help a reader understand.

Type of Context Clue	Sentence



Name: _____ Date: _____

Life and the Flow of Energy Quiz

Directions: Read each question. Choose the best answer. Fill in the bubble for the answer you have chosen.

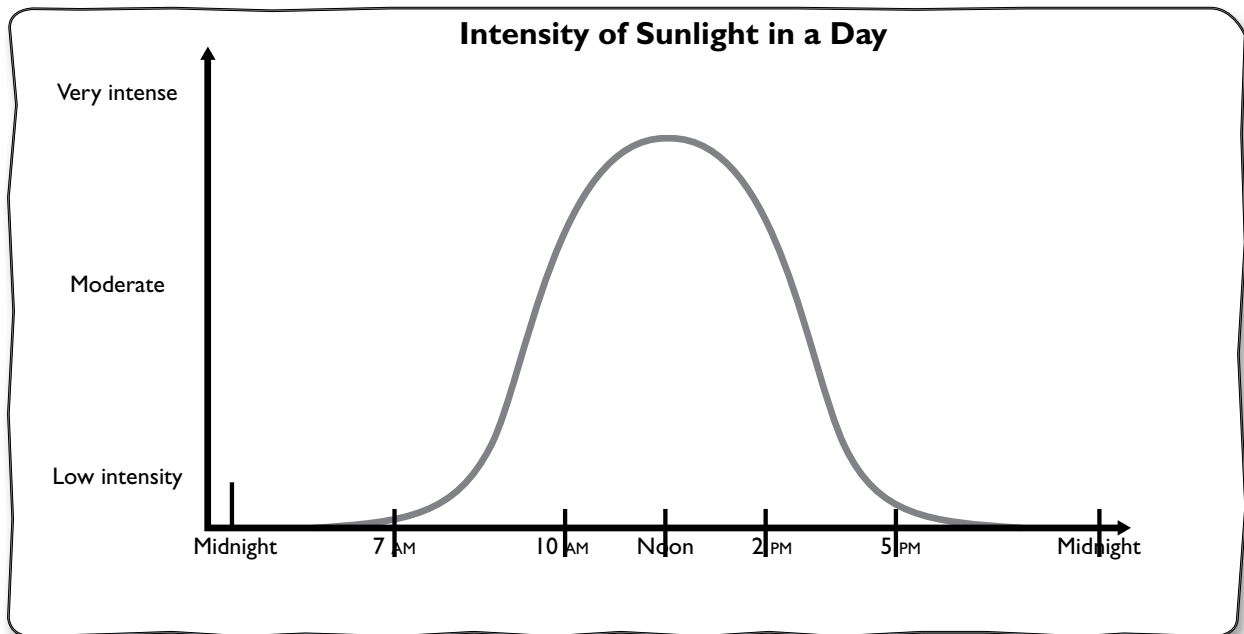
- 1** What does *interdependence* mean?
- (A) depends upon one another
 - (B) only eats plants
 - (C) does not depend upon anything
 - (D) gets energy from the sun
- 2** What can you learn from the context of the following sentences? *Plants convert the sun's energy into chemical energy. They use a process called photosynthesis.*
- (A) Any type of changing energy is photosynthesis.
 - (B) The sun changes the energy of plants.
 - (C) Photosynthesis is how plants use the sun's energy.
 - (D) Plants cannot use the sun's energy.
- 3** How does finding the meaning of unknown words help a reader?
- (A) It helps a reader better understand the text.
 - (B) It helps a reader write better.
 - (C) It helps a reader find page numbers faster.
 - (D) It helps a reader think about texts.
- 4** Which is NOT a type of context clue?
- (A) examples in a text
 - (B) synonyms
 - (C) a glossary definition
 - (D) antonyms
- 5** What does the following sentence mean? *The sun releases energy that radiates away in all directions.*
- (A) The sun's energy is dangerous.
 - (B) We can't see the sun's energy.
 - (C) We can't control the sun's energy.
 - (D) Energy spreads away from the sun.
- 6** Organisms that break down and feed on dead plants and animals are _____.
- (A) composers
 - (B) decomposers
 - (C) species
 - (D) nutrients



Name: _____ Date: _____

Solar Intensity STEM

Directions: The line graph below shows the solar intensity, or strength, of the sun's energy throughout the day. Use the graph to answer the questions below.

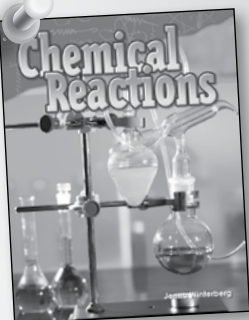


1 What times of day is the sun the most intense?

2 How would you describe the sun's intensity throughout the day?

3 Why do some parts of the graph show no solar energy?





Learning Objectives

Students will:

- identify the main ideas of sections of the text.
- use information from the text to write a paragraph about chemical reactions in their everyday lives.
- observe chemical changes and chemical properties.

Standards

- **Reading:** Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
- **Writing:** Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.
- **Content:** Know that substances can be classified by their physical and chemical properties.
- **Language:** Communicate information, ideas, and concepts necessary for academic success in the content area of Science.

Lesson Timeline

<p>Day 1 Task</p> <p>Introductory and Lab Activities (page 139)</p> <p>Summary of Student Learning Activities</p> <p>Observe and record the results of a chemical reaction.</p>	<p>Day 2 Task</p> <p>Before Reading (page 140)</p> <p>Summary of Student Learning Activities</p> <p>Predict the main idea of the book.</p>	<p>Day 3 Task</p> <p>During Reading (page 141)</p> <p>Summary of Student Learning Activities</p> <p>Identify the main ideas of sections of the text, and write a paragraph about chemical reactions.</p>
<p>Day 4 Task</p> <p>After Reading (page 142)</p> <p>Summary of Student Learning Activities</p> <p>Refer to notes to summarize the text.</p>	<p>Day 5 Task</p> <p>Activity from the Book (page 142) and Assessments (pages 147–148)</p> <p>Summary of Student Learning Activities</p> <p>Observe chemical changes in food, and take the assessments.</p>	

Materials

- copies of the *Cabbage Observations* activity sheet (page 143)
- 3 clear cups
- hot water
- powdered laundry detergent
- purple cabbage
- sealable bags
- spoon
- vinegar

Day 1

Observe and record the results of a chemical reaction.

Introductory Activity

Engage

1. Ask students whether they have ever helped bake cookies. Ask students about the changes the ingredients, or reactants, underwent to become a cookie.
2. Tell students that the ingredients had to undergo chemical changes to make a new substance. Tell students that they will learn more about chemical reactions.

Lab Activity

Explore & Explain

1. Place students in small groups. Distribute a set of materials and copies of the *Cabbage Observations* activity sheet (page 143) to each group.
2. Have students place 5–10 purple cabbage leaves into a sealable bag and fill the bag halfway with hot water. Have them zip the bag tightly and squish the ingredients together until they have purple cabbage juice. **Note:** Cabbage juice may stain clothing and surfaces.
3. Have students fill each cup about halfway with the cabbage juice, making sure not to pour large chunks of cabbage into the cups. Have students record their observations on the activity sheet.
4. Have students add a spoonful of vinegar to the first cup, a spoonful of powdered laundry detergent to the second cup, and a spoonful of water to the third cup. Have students record the results on the activity sheet. **Note:** Be sure to have students rinse their spoons each time to avoid contamination.
5. Ask questions to guide students to the idea that color change often indicates a chemical reaction.
 - What happened when you added different ingredients to the juice?
 - What do you think caused these changes?
 - What kind of change resulted from each ingredient? How do you know?
6. Bring the class together for instruction. Clarify misconceptions by having students explain their understandings using logic and evidence to support their ideas.

Materials

- Chemical Reactions books
- copies of the *Main Idea Prediction* activity sheet (page 144)
- drawing paper
- coloring supplies

Day 2

Predict the main idea of the book.

Vocabulary Word Bank

- byproduct
- catalyst
- inhibitor
- product
- reactants

Before Reading

Elaborate

1. Distribute drawing paper and coloring supplies to students. Lead students in drawing and labeling a diagram of a reaction as an introduction to the vocabulary words. Have students follow along while you narrate each part.
 - *Reactants are substances that are added to create a reaction.* (Draw two beakers and label them *reactants*.)
 - *The result of a reaction is a product.* (Draw a beaker and label it *product*. Draw an arrow from the reactants to the product.)
 - *A catalyst can speed up a chemical reaction.* (Draw a beaker above the reactants with a rabbit on it and label it *catalyst*.)
 - *An inhibitor can slow down a chemical reaction.* (Draw a beaker below the reactants with a tortoise on it and label it *inhibitor*.)
 - *A byproduct is a secondary product that is made during a chemical reaction.* (Draw a little beaker next to the product and label it *byproduct*.)
- Support **below-level learners** and **English language learners** by analyzing and comparing word parts. For example, *reactants* contains the word *react*. *Byproduct* also contains the word *product*.
2. Distribute the *Chemical Reactions* books to students. Have students flip through the book, asking them to notice the various text features, such as headings, sidebars, captions, and images. Explain to students that authors include many details in the body text and in the text features to support the main ideas.
3. Distribute copies of the *Main Idea Prediction* activity sheet (page 144) to students. Have students use the text features they observed to complete the activity sheet.
4. Discuss student predictions as a class. Explain to students that the main idea of sections or chapters may also be key details that support the main idea of the text as a whole.

Day 3

Identify the main ideas of sections of the text, and write a paragraph about chemical reactions.

Materials

- *Chemical Reactions* books
- copies of the *Taking Notes* activity sheet (page 145)

During Reading

Elaborate

1. Distribute the *Chemical Reactions* books to students. For the first reading, read the book aloud as students follow along. Pause periodically to paraphrase the main ideas of sections or pages of text. Explain that paraphrasing means putting the author's ideas into your own words. Discuss key details in the text that support the main ideas.
 - You may choose to display the Interactiv-eBook for a more digitally enhanced reading experience.
2. Distribute copies of the *Taking Notes* activity sheet (page 145) to students. For the second reading of the book, have students read in small groups. Have them use their activity sheets to record the main idea of each chapter. Encourage students to find at least three details that support the main ideas that they write. **Note:** Save students' activity sheets for later use.
 - You may wish to have students digitally annotate the PDF of the text by highlighting key details.
 - For **below-level learners** and **English language learners**, you may choose to play the audio recording as students follow along to serve as a model of fluent reading. This may be done in small groups or at a listening station. The recordings will help struggling readers practice fluency and aid in comprehension.
3. Discuss types of chemical reactions that students observe in their everyday lives, such as cookies baking or iron rusting. Discuss examples from the text, and ask students to discuss examples that may not have been included in the text. Record student responses on the board.
4. Have students write a paragraph explaining how chemical reactions affect their everyday lives. Ask them to include specific examples from the text. Have them include a main idea with at least three supporting details in their paragraphs.
 - Challenge **above-level learners** to include a strong introduction and conclusion to support their main idea.

Days 4&5

Refer to notes to summarize the text. Observe chemical changes in food, and take the assessments.

Materials

- *Chemical Reactions* books
- copies of the *Chemical Reactions Summary*, *Chemical Reactions Quiz*, and *pH Scale* activity sheets (pages 146–148)
- students' copies of the *Taking Notes* activity sheet (page 145)

After Reading

Elaborate & Evaluate

1. Write the vocabulary words on the board, and review their definitions as a class. Place students in small groups, and assign each group a vocabulary word. Have students write an acrostic poem for their assigned word. Explain to students that their acrostic poem should include words that are related to the vocabulary word or explain its meaning. Once students are finished, have them share their poems with the class.
2. As a class, review the main ideas students wrote on the *Taking Notes* activity sheet (page 145) from the *During Reading* activity. Explain to students that each section can have its own main idea but they all support the main idea of the entire text. As a class, brainstorm the main idea of the whole text. Record student responses on the board.
3. Distribute copies of the *Chemical Reactions Summary* activity sheet (page 146) to students. Model for students how to refer to their notes of the text to write a summary of the whole text. Then, have students complete the activity sheet. Once students are finished, have them share their summaries with the class.

Activity from the Book

Read the Your Turn! prompt aloud from page 32 of the *Chemical Reactions* book. Have students observe chemical changes in foods as they cook.

1. A short posttest, *Chemical Reactions Quiz* (page 147), is provided to assess student learning from the book.
2. A data analysis activity, *pH Scale* (page 148), is provided to assess students' understanding of how to analyze scientific data. Explain to students that the pH scale shows how acidic or basic common items are. **STEM**
3. The Interactiv-eBook activities may be used as a form of assessment (optional).

Name: _____ Date: _____

Cabbage Observations

Directions: Pour cabbage juice into cups and record your observations. Then, record your observations when you add each of the reactants listed below.

Reactants	Observations
cabbage juice	
cabbage juice and vinegar	
cabbage juice and laundry detergent	
cabbage juice and water	

Name: _____ Date: _____

Main Idea Prediction

Directions: Predict the main idea of the text. Write what you observed in the book that led you to that prediction.

Observation:

Page: _____

Observation:

Page: _____

Observation:

Page: _____

Main Idea

Name: _____ Date: _____

Taking Notes

Directions: Paraphrase the main idea of each chapter of the text.

Chapter Title	Main Idea
Combining Substances	
Examining Properties	
Creating a Product	
Categorizing Reactions	

Name: _____ Date: _____

Chemical Reactions Summary

Directions: Use your notes to write a summary of the text. Include the main idea of the whole text. Then, explain how key details in the text support it.

Name: _____ Date: _____

Chemical Reactions Quiz

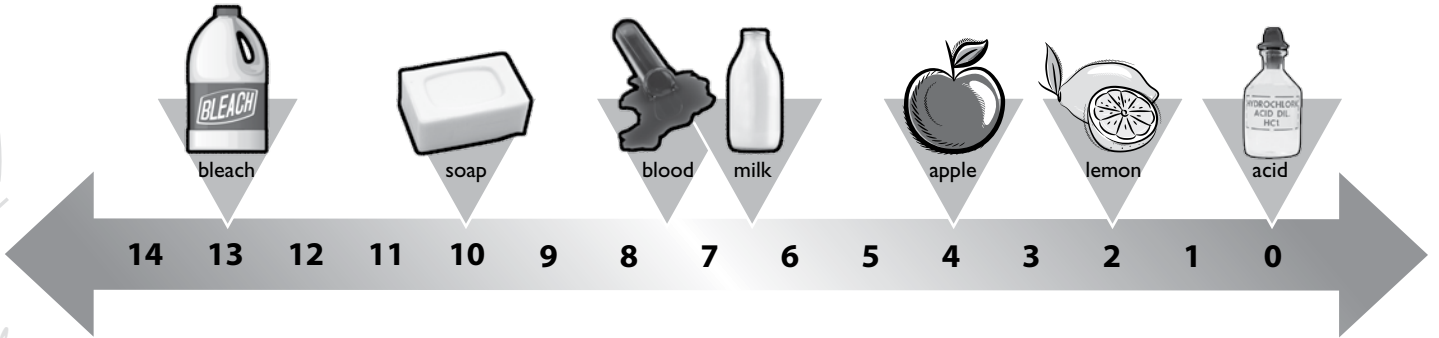
Directions: Read each question. Choose the best answer. Fill in the bubble for the answer you have chosen.

- 1** Which of the following is NOT a physical property?
- (A) weight
 - (B) color
 - (C) how much you like something
 - (D) magnetism
- 2** Which sentence best describes one of the main ideas of the book?
- (A) A fire in a fireplace is a chemical reaction.
 - (B) Physical properties tell about a substance.
 - (C) Acids can be weak.
 - (D) Chemical reactions happen all around us.
- 3** What is NOT a key detail that supports the main idea you chose above?
- (A) Combustion is a chemical reaction that can send a rocket to the moon.
 - (B) Airbags use chemical reactions to expand.
 - (C) Preparing food is a fun way to see chemical reactions.
 - (D) Chemical reactions only occur in labs.
- 4** Which of the following is NOT a type of reaction?
- (A) synthesis
 - (B) destruction
 - (C) single displacement
 - (D) double displacement
- 5** What term means to put the author's ideas in your own words?
- (A) main idea
 - (B) details
 - (C) paraphrase
 - (D) quote
- 6** Chemical _____ are the characteristics of matter that can be observed during a chemical change.
- (A) catalysts
 - (B) changes
 - (C) properties
 - (D) combustions

Name: _____ Date: _____

pH Scale STEM

Directions: The pH scale below shows how acidic or basic common items are. Use the scale to answer the questions below.



1 What item has the highest pH?

2 What has a pH of 4?

3 Which item is more acidic, a lemon or an apple? How do you know?

4 Describe the trend in the data above.



Learning Objectives

Students will:

- identify cause-and-effect relationships in the text.
- write an opinion paragraph on whether we should do more space exploration.
- investigate how scientists compare light from different stars.

Standards

- **Reading:** Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
- **Writing:** Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
- **Content:** Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.
- **Language:** Communicate information, ideas, and concepts necessary for academic success in the content area of Science.

Lesson Timeline

Day 1

Task

Introductory and Lab Activities (page 183)

Summary of Student Learning Activities

Observe patterns from different light sources.

Day 2

Task

Before Reading (page 184)

Summary of Student Learning Activities

Find cause-and-effect signal words in the text.

Day 3

Task

During Reading (page 185)

Summary of Student Learning Activities

Identify cause-and-effect relationships in the text, and write an opinion paragraph.

Day 4

Task

After Reading (page 186)

Summary of Student Learning Activities

Identify a cause with multiple effects in the text.

Day 5

Task

Activity from the Book (page 186) and **Assessments** (pages 191–192)

Summary of Student Learning Activities

Observe and record the stars, and take the assessments.

Day 1

Observe patterns from different light sources.

Materials

- copies of the *Types of Light* activity sheet (page 187)
- 2 light sources, such as a lamp and a flashlight
- boxes (cube-shaped is best)
- cardboard tubes
- CDs
- duct tape
- paper
- thin cardboard
- transparent, milky, plastic film such as tape or a white grocery bag

Introductory Activity

Engage

1. Illuminate both light sources. Ask students to compare and contrast the light from each source.
2. Explain to students that light coming from different stars can also be compared and contrasted. Tell students that they will learn how scientists observe light from stars.

Lab Activity

Explore & Explain

1. Place students in small groups. Distribute a box, a cardboard tube, a CD, duct tape, paper, cardboard, plastic film, and copies of the *Types of Light* activity sheet (page 187) to each group. **Note:** You may wish to distribute precut boxes and have students reference the illustrated directions on page 29 of the *Stars* book. **STEM**
2. Have students tape paper over most of the CD, leaving a small section uncovered. Have students tape the CD inside the box so that the uncovered section is aligned with a corner of the box. Across from the uncovered section, have students cut a small hole about 5 centimeters (2 inches) in the box.
3. Have students tape two pieces of cardboard over the hole to create a small vertical slit about 1 millimeter (0.04 in.) wide. Have them tape the film over the slit.
4. On the side of the box adjacent to where the CD is exposed, have students cut a small hole and tape the cardboard tube around the hole to create an eyepiece.
5. Have students tape the box closed. Have them shine light from different sources through the slit, view them through the eyepiece, and record their observations.
6. Ask questions to guide students to the idea that light from different sources has different observable properties.
 - How does the light from different sources differ?
 - What do you think makes them appear different?
 - How might this be useful to scientists?
7. Bring the class together for instruction. Clarify misconceptions by having students explain their understandings using logic and evidence to support their ideas.

Materials

- Stars books
- copies of the *Signal Words* activity sheet (page 188)
- chart paper

Day 2

Find cause-and-effect signal words in the text.

Vocabulary Word Bank

- constellations
- latitude
- light years
- nuclear fusion
- satellites

Before Reading

Elaborate

1. Write the vocabulary words on the board, and discuss their meanings. Show students pictures related to the words (pictures from the book may be used), use gestures to represent the words, or use the words in sentences that provide context for the meanings of the words. Then, write the following related words on the board: *stars, distance, moon, shapes, gravity, Earth, fuel, and position*. Ask students which words relate to each vocabulary word. Accept any as solutions as long as students can provide a logical explanation.
2. Display the *Stars* book for students. Show students a few of the images and other text features in the book. Tell students that there are many cause-and-effect relationships in this book. Explain that identifying the relationships between ideas in the text can help a reader better understand the text.
3. Read the sidebar on page 6 aloud. Tell students that in this piece of text, the cause is that talking about large distances can be overwhelming, and the effect is that astronomers measure distances in light years.
4. Help students create a list of signal words that identify cause-and-effect relationships. Record the words on a sheet of chart paper. Include words such as *because, affect, since, so, if, when, and why*. **Note:** Save this list for later use.
5. Distribute copies of the *Signal Words* activity sheet (page 188) to students. Have students use the book to complete the activity sheet. Discuss the signal words that students found most often. If students identify additional signal words, record these on the list.
 - You may wish to have students digitally annotate the PDF of the text by circling cause-and-effect signal words.

Day 3

Identify cause-and-effect relationships in the text, and write an opinion paragraph.

Materials

- Stars books
- copies of the *Exploring Space* activity sheet (page 189)
- list of cause-and-effect signal words from the Before Reading activity

During Reading

Elaborate

1. Review the list of cause-and-effect signal words from the Before Reading activity. Distribute the *Stars* books to students. Read the book aloud as students follow along for the first reading. Pause periodically to point out cause-and-effect relationships and signal words in the text. For example, after reading page 7, explain to students that studying the sun is the cause, and astronomers learning things about stars is the effect.
 - You may choose to display the Interactiv-eBook for a more digitally enhanced reading experience.
2. Have students read in small groups for the second reading. Have group members take turns reading paragraphs aloud. Ask them to discuss additional cause-and-effect relationships in the text. Tell students that they can identify connections in diagrams, sidebars, captions, and body text.
 - For **below-level learners** and **English language learners**, you may choose to play the audio recording as students follow along to serve as a model of fluent reading. This may be done in small groups or at a listening station. The recordings will help struggling readers practice fluency and aid in comprehension.
3. As a class, discuss the connections students found. Add new signal words to the list, if needed.
4. Distribute copies of the *Exploring Space* activity sheet (page 189) to students. Discuss arguments for and against more space exploration, including potential discoveries and the cost of space exploration. Then, have students outline their paragraphs. Encourage students to reference the book, if needed. Have students use their outline to write a paragraph on a separate sheet of paper.
 - Help **below-level learners** and **English language learners** locate sections in the book that might support their opinions.
 - Have **above-level learners** include answers to possible objections in their paragraphs.

Days 4&5

Identify a cause with multiple effects in the text. Observe and record the stars, and take the assessments.

Materials

- Stars books
- copies of the *Many Effects*, *Stars Quiz*, and *Planet Days and Years* activity sheets (pages 190–192)
- empty tube

After Reading

Elaborate & Evaluate

1. Play a short game to review the vocabulary words. Divide the class into two teams. Choose an artist from each team. Invite them to the front of the room, and show them one of the vocabulary words. Have each artist draw his or her own representation of the word on the board. Award a point to the team that guesses correctly first. You may choose to add other context-related words to make the game more challenging.
2. As a class, discuss the cause-and-effect relationships in the *Stars* book. Explain to students that one cause can have multiple effects. Provide real-life examples, such as if a boy tripped over his shoelaces, he could drop what he was holding and bump into another person. Explain how the effects happened at the same time and were caused by one event.
3. Distribute the *Stars* books and copies of the *Many Effects* activity sheet (page 190) to students. Have students reread the sidebar and study the image on page 15 of the book. Then, have them complete the activity sheet. Have students share their ideas with the class.

Activity from the Book

Read the Your Turn! prompt aloud from page 32 of the *Stars* book. Have students look at the night sky through an empty tube and count the stars they see.

1. A short posttest, *Stars Quiz* (page 191), is provided to assess student learning from the book.
2. A data analysis activity, *Planet Days and Years* (page 192), is provided to assess students' understanding of how to analyze scientific data. Explain to students that the chart shows how long each day and year is on various planets compared to those on Earth. **STEM**
3. The Interactiv-eBook activities may be used as a form of assessment (optional).

Name: _____ Date: _____

Types of Light STEM

Directions: Record the light sources you test and your observations.

Light Source	Observations

Name: _____ Date: _____

Signal Words

Directions: Skim the text to find cause-and-effect signal words. Use the chart below to record words you find.

Word	Page

Name: _____ Date: _____

Exploring Space

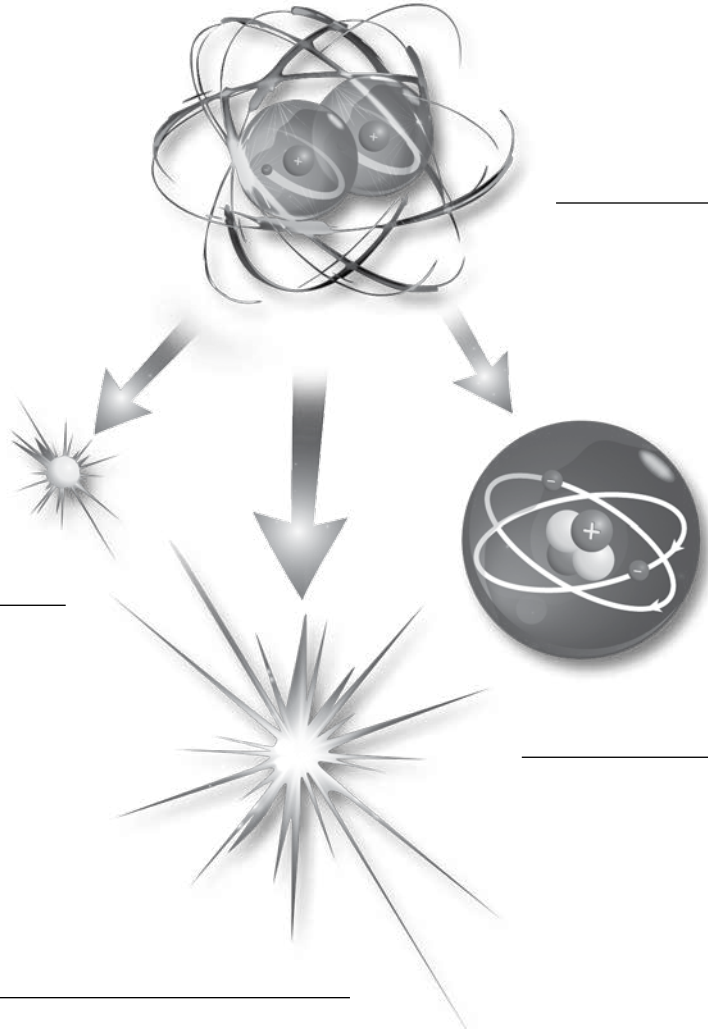
Directions: Write a paragraph explaining whether we should do more space exploration. Use the chart below to outline your paragraph.

Opinion	
Reason	Reason
Evidence	Evidence

Name: _____ Date: _____

Many Effects

Directions: Reread the sidebar and study the image on page 15 of the text. Label the cause and the effects. Then, describe how one cause had multiple effects.



Name: _____ Date: _____

Stars Quiz

Directions: Read each question. Choose the best answer. Fill in the bubble for the answer you have chosen.

- 1** What causes a star to die?
- (A) It evaporates.
 - (B) It is launched out of a black hole.
 - (C) Other stars get too close to it.
 - (D) It runs out of hydrogen, or fuel.
- 2** What is the effect of nuclear fusion in a main sequence star?
- (A) The star burns out.
 - (B) It releases a massive amount of heat and energy.
 - (C) Hydrogen atoms explode.
 - (D) Hydrogen atoms move away from each other.
- 3** Why was it easy to see stars long ago?
- (A) There were more stars.
 - (B) The stars were not so far away.
 - (C) There were no bright city lights.
 - (D) People used advanced telescopes.
- 4** What object has such strong gravity that even light cannot escape it?
- (A) black hole
 - (B) supernova
 - (C) galaxy
 - (D) protostar
- 5** What works together to keep a star stable?
- (A) heat and light
 - (B) nuclear fusion and light
 - (C) nuclear fusion and gravity
 - (D) magnetism and gravity
- 6** An object in space that orbits another object is a _____.
- (A) constellation
 - (B) satellite
 - (C) dwarf
 - (D) supernova

Name: _____ Date: _____

Planet Days and Years STEM

Directions: The chart shows days (one full rotation) and years (one full revolution around the sun) on other planets in relation to Earth. It also shows their distances from the sun in kilometers and miles. Use the data to answer the questions.

Planet	Day	Year	Distance from Sun
Mercury	59 days	88 days	57 million km (35 million mi.)
Venus	243 days	225 days	108 million km (67 million mi.)
Earth	24 hours	365 days	150 million km (93 million mi.)
Mars	25 hours	687 days	228 million km (142 million mi.)
Jupiter	10 hours	12 years	779 million km (484 million mi.)
Saturn	11 hours	29.5 years	1.43 billion km (889 million mi.)
Uranus	17 hours	84 years	2.88 billion km (1.79 billion mi.)
Neptune	16 hours	165 years	4.50 billion km (2.8 billion mi.)

- 1 Which planet has the longest year? _____
- 2 Which planet has the longest day? _____
- 3 What planet has a rotation and revolution that are almost the same? How can you tell?

- 4 What is the connection between the distance from the sun and the length of the year on other planets?

