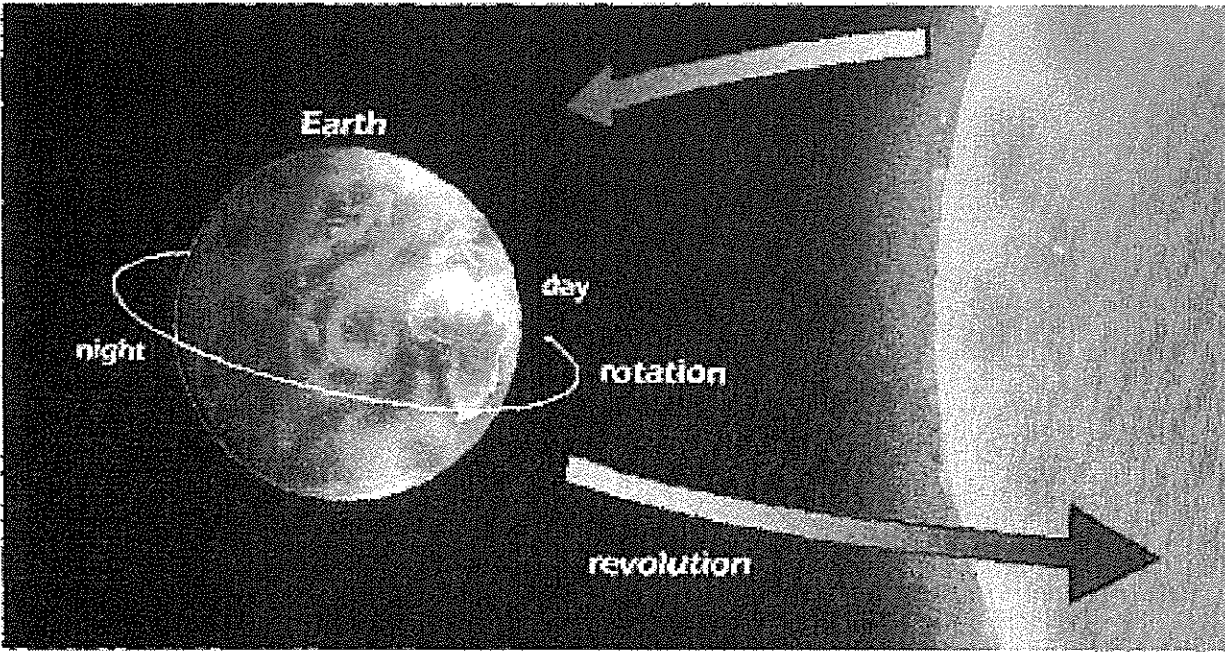


Chapter 15: Patterns in the Sky



Earth rotates on its axis as it revolves around the sun.

- Earth rotates on its axis once every 24 hours. This rotation causes us to experience day and night.
- Earth revolves around the sun once every $365 \frac{1}{4}$ days, or one year.
- We experience the four seasons because Earth is tilted as it revolves around the sun.

The Chapter 15 test is scheduled for _____.
Review study guide on packet pages 1 & 2, packet pages 7, 8, 9, 10, and 11, and book pages 444-445 to prepare for the test.

Name _____ Section _____

Name _____ Test Date _____

Chapter 15: Patterns in the Sky---Study Guide

These items can be found in your child's packet in the science section or in their science book. All items have been discussed at length in class. Please refer to the cover of the packet to view which packet pages to study.

Words to Know:

star

axis

rotation

revolution phase

lunar eclipse

telescope

constellation

<http://quizlet.com/1954930/scott-foresman-science-3rd-grade-chapter-15-flash-cards/>

Please use this website to study and review vocabulary words from this chapter.

Ideas to Know:

Lesson 1

- The Sun is a **star**- a giant ball of hot, glowing gases and is the source of light on Earth.
- The Earth is always moving.
- The Earth spins on an imaginary line called its **axis**.
- The Earth makes one complete spin on its axis, or **rotation**, every 24 hours.
- As the Sun appears to move higher in the sky, the shadow becomes shorter.
- In the afternoon the Sun is at its highest point in the sky.

Lesson 2

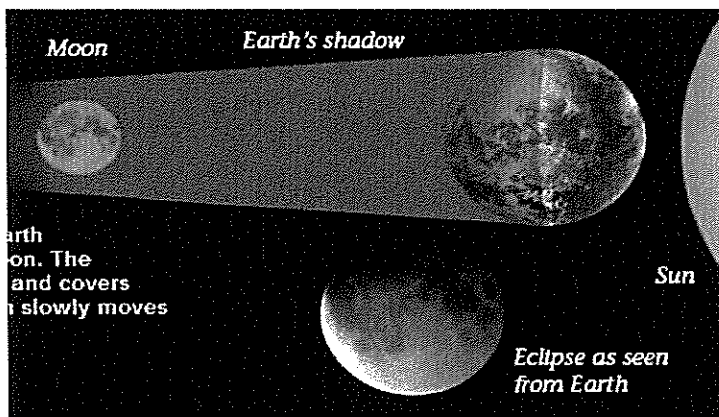
- Earth's tilt and movement around the Sun cause the seasons.
- Earth makes one **revolution** when it makes one complete trip around the Sun. This takes one year.
- The northern half of Earth tilts more toward the Sun in June.
- In December the northern half of the Earth gets less sunlight-this is which causes less direct sunlight, colder temperatures, and fewer hours of daylight.
- We see the sun in different places in the sky in different seasons.

Lesson 3

- The Moon rotates on its axis about every 27 days and revolves around Earth in almost the same time.
- The light we see from the Moon is reflected light from the Sun.
- We see only one side of the Moon.
- Each different way the Moon looks is a different **phase** of the Moon.
- The phases happen because movements of the Earth and Moon cause different amounts of the lighted half of the Moon to be seen from Earth.

****Check out the different phases on page 435****

- A **lunar eclipse** occurs when the Moon moves behind the Earth, and Earth blocks sunlight from reaching the Moon.



Lesson 4

- The night sky is filled with stars that vary in brightness, size, and distance from Earth.
- **Telescopes** are tools that magnify objects that are far away.
- The stars that are the farthest away are the dimmest and the hardest to see.
- A group of stars that makes a pattern is a **constellation**.
- Stars seem to be moving during the night because Earth rotates on its axis.

Lab Activity
zone

Why do shadows change shape during the day?

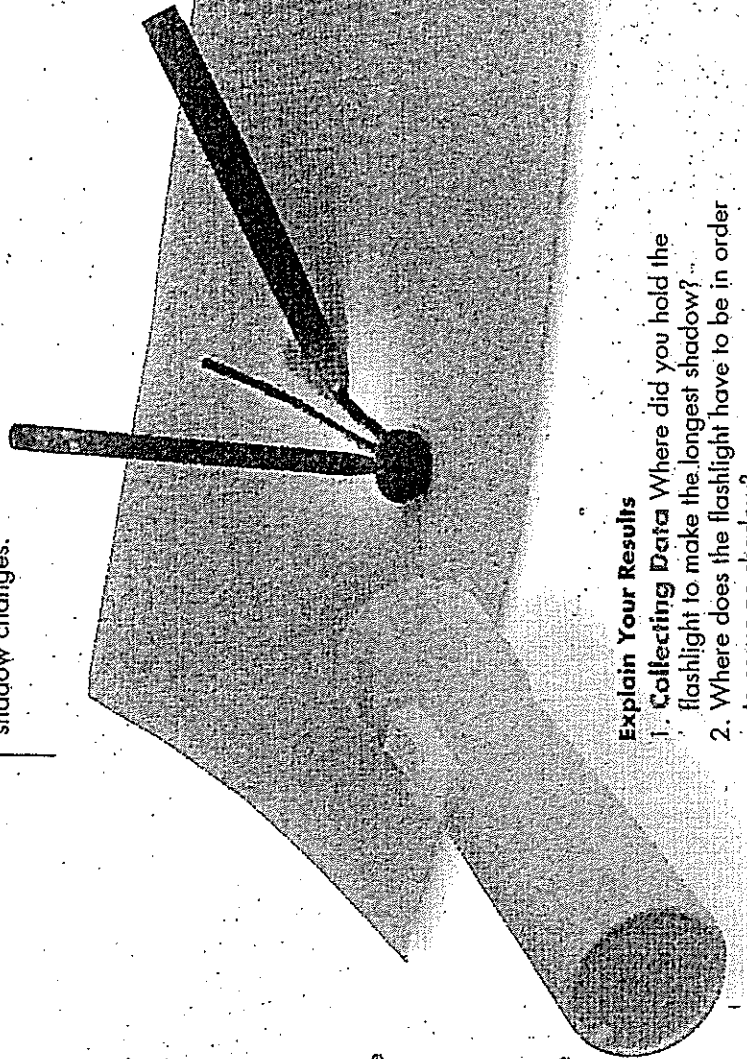
Materials



What to Do

- Put a lump of clay on the paper. Stick the pencil point in the clay so the pencil stands up.
- Using Models** Shine the flashlight on the pencil from the side. Use the marker to trace the pencil's shadow.
- Move the flashlight slowly in an arc over the pencil. **Observe** how the shadow changes. Trace the shadow in four different positions.

- Hold the flashlight in different positions over and around the pencil. Observe how the pencil's shadow changes.



Explain Your Results

- Collecting Data** Where did you hold the flashlight to make the longest shadow?
- Where does the flashlight have to be in order to cause no shadow?
- Infer** Why do shadows outside change shape during the day?

THOUGHTS TO TRY
You can observe models to infer new ideas.

Name _____

Use with page 29

Why do shadows change shape during the day?

Record your observations in the boxes below.

Shadow When Flashlight Is Close to Pencil	Shadow When Flashlight Is Far From Pencil

Explain Your Results

1. Collecting Data: Where did you hold the flashlight to make the longest shadow?

2. Where does the flashlight have to be in order to cause no shadow?

3. Infer: Why do shadows outside change shape during the day?

Lab Activity Zone

What causes an eclipse of the Sun?

Materials



basketball



tennis ball



flashlight

What to Do

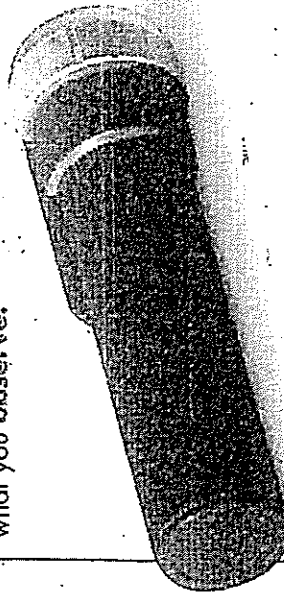
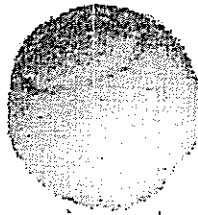
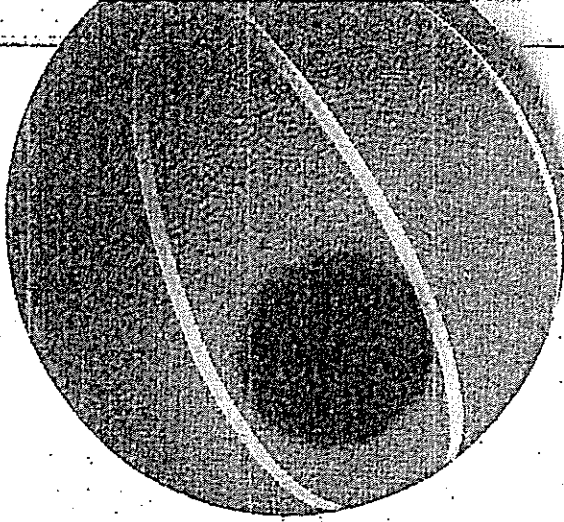
1. **Make a Model** Let the basketball stand for Earth, the tennis ball stand for the Moon, and the flashlight stand for the Sun.
2. Shine the Sun on Earth. Record what you observe.

3. Place the Moon behind Earth, farthest from the Sun. Record what you observe.

Process Skills

You can infer what happens during a solar eclipse by observing your model.

3. Move the Moon around Earth until the Moon is between the Sun and Earth. Record what you observe.



Explain Your Results

1. **Observe** What happened when the Moon was between the Sun and Earth?
2. Is all of Earth affected by a solar eclipse? Why or why not?
3. **Infer** What happens on the part of Earth that is affected by a solar eclipse?

Name _____

Use with page 30

What causes an eclipse of the Sun?

Record what you observe in the chart below.

Sun Shining on Earth	Moon Behind Earth	Moon Between Sun and Earth

Explain Your Results

1. Observe: What happened when the Moon was between the Sun and Earth?

2. Is all of Earth affected by a solar eclipse? Why or why not?

3. Infer: What happens on the part of Earth that is affected by a solar eclipse?

Read each sentence. Choose the answer that gives the best meaning for the boldface word.

1. Earth makes a complete **rotation** every twenty-four hours.
A. circle B. spin C. day D. week
2. The Sun is a **star** that gives Earth heat and light.
A. super-sized planet C. very distant object
B. huge rock D. hot ball of gases
3. A full Moon and a crescent Moon are two Moon **phases**.
A. stages C. craters
B. separate parts D. copies
4. Earth spins on its **axis** like a wheel spins on an axle.
A. east-to-west line C. line from pole to pole
B. flat pancake shape D. force field that pulls
5. In a year, Earth makes one **revolution** around the Sun.
A. circle around a center C. set of seasons
B. trip to and from D. change of direction
6. In a **lunar eclipse**, Earth moves between the Sun and Moon.
A. blocking of the Sun's light
B. Earth's shadow covering Moon
C. blocking of the Moon by Earth
D. Moon's shadow covering Earth
7. A **telescope** shows details of the Moon and stars.
A. tool that magnifies C. lighted tube
B. tool that makes things look smaller D. darkened pipe
8. Long ago, people named each **constellation** of stars.
A. any cluster of stars C. group of stars in a pattern
B. quarter of the sky D. half of the sky



Notes for Home: Your child learned the vocabulary terms for Chapter 15.
Home Activity: Ask your child to find an example or diagram in the chapter to help explain the meaning of each vocabulary word.

Reviewing Terms: Matching

Match each description with the correct word. Write the letter on the line next to each description.

- _____ 1. a giant ball of hot, glowing gases
 - _____ 2. the imaginary line around which Earth spins
 - _____ 3. one complete spin on an axis
- a. axis
 - b. star
 - c. rotation

Reviewing Concepts: Sentence Completion

Complete each sentence with the correct word or phrase.

- _____ 4. Earth is _____ compared to the Sun. (large, small)
- _____ 5. At any time, _____ of Earth is facing the Sun. (half, all)
- _____ 6. Earth makes one rotation every _____ hours. (12, 24)
- _____ 7. The length and direction of shadows _____ throughout the day. (change, stay the same)
- _____ 8. Shadows are very _____ at midday. (long, short)

Applying Strategies: Sequence

9. The Sun's place in the sky seems to change throughout the day. The steps are listed below, but they are out of order. Use the clue words to place the steps in the correct order. (2 points)

Finally, the Sun appears to set in the west.
First, the Sun appears to rise in the east.
Next, the Sun appears to move across the sky.

Reviewing Terms: Sentence Completion

Complete the sentence with the correct word.

- _____ 1. A _____ is one complete trip around the Sun.
(revolution, rotation)

Reviewing Concepts: True or False

Write T (True) or F (False) on the line before each statement.

- _____ 2. Earth's axis always points toward the same direction in space.
- _____ 3. The places on Earth that receive the most direct Sun are the warmest.
- _____ 4. The seasons are caused by Earth's tilt and movement around the Sun.
- _____ 5. Earth makes one revolution in 24 hours.
- _____ 6. In most places on Earth the number of hours of daylight and darkness changes throughout the year.
- _____ 7. During winter there are more hours of daylight than darkness.
- _____ 8. The Sun appears higher in the sky during summer than it does in winter.

Applying Strategies: Calculating

9. In the Northern United States there are 15 hours of daylight on some days during June. On those days, how many hours of darkness are there? Show your work, and write a sentence that explains how you found your answer. (2 points)

Reviewing Terms: Matching

Match each description with the correct word or phrase. Write the letter on the line next to each description.

- _____ 1. each different way the Moon looks a. lunar eclipse
- _____ 2. when Earth blocks sunlight from reaching the Moon b. phase

Reviewing Concepts: True or False

Write T (True) or F (False) on the line before each statement.

- _____ 3. It takes the Moon about 29 days to complete one rotation.
- _____ 4. The Moon makes its own light.
- _____ 5. During a New Moon, the Moon looks like a half circle.
- _____ 6. The Moon looks like a half circle during the First Quarter Moon.
- _____ 7. The Full Moon looks like a circle.
- _____ 8. The lighted half of the Moon can always be seen from Earth.

Writing

9. Write a paragraph that describes the positions of the Earth, Moon, and Sun during a lunar eclipse. (2 points)

Reviewing Terms: Matching

Match each description with the correct word. Write the letter on the line next to each description.

- _____ 1. a group of stars that makes a pattern
 - _____ 2. a tool that magnifies faraway objects
- a. telescope
 - b. constellation

Reviewing Concepts: True or False

Write T (True) or F (False) on the line before each statement.

- _____ 3. All stars are the same size.
- _____ 4. Some stars are brighter than others.
- _____ 5. Some telescopes use mirrors and lenses.
- _____ 6. The stars in constellations are close together in space.
- _____ 7. Stars appear to move across the sky at night.
- _____ 8. Constellations always appear in the same part of the sky.

Applying Strategies: Main Idea and Supporting Details

Use complete sentences to answer question 9. (2 points)

9. Write three details that support the main idea given below.
Main Idea: Stars appear in patterns in the sky.

Detail: _____

Detail: _____

Detail: _____

Comparing Times of Moonrise and Moonset

Like the Sun, the Moon rises and sets every day. However, the time of moonrise and moonset varies more than sunrise and sunset do. Use the table below to answer the questions.

DATE	MOONRISE	MOONSET
May 9, 2004	1:00 A.M.	9:48 A.M.
July 9, 2004	12:28 A.M.	1:34 P.M.
September 9, 2004	12:55 A.M.	5:04 P.M.
November 9, 2004	2:59 A.M.	3:09 P.M.

- How many hours and minutes were between moonrise and moonset on May 9?

- Which date had the longest time between moonrise and moonset?

- If you stayed up to see the Moon rise, on which date would you stay up the longest?

- Put the dates in order, from shortest time to longest time between moonrise and moonset.

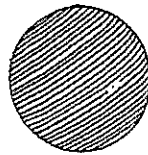
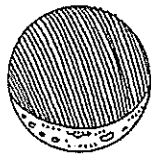


Notes for Home: Your child used a table to calculate elapsed time.
Home Activity: Study the table with your child. Decide if the Moon can only be found in the sky at night or both at night and during daylight hours.

Phases of the Moon

Look at the pictures of the Moon below.

Draw lines to match the pictures on the left with the phase of the Moon on the right.



New Moon

Full Moon

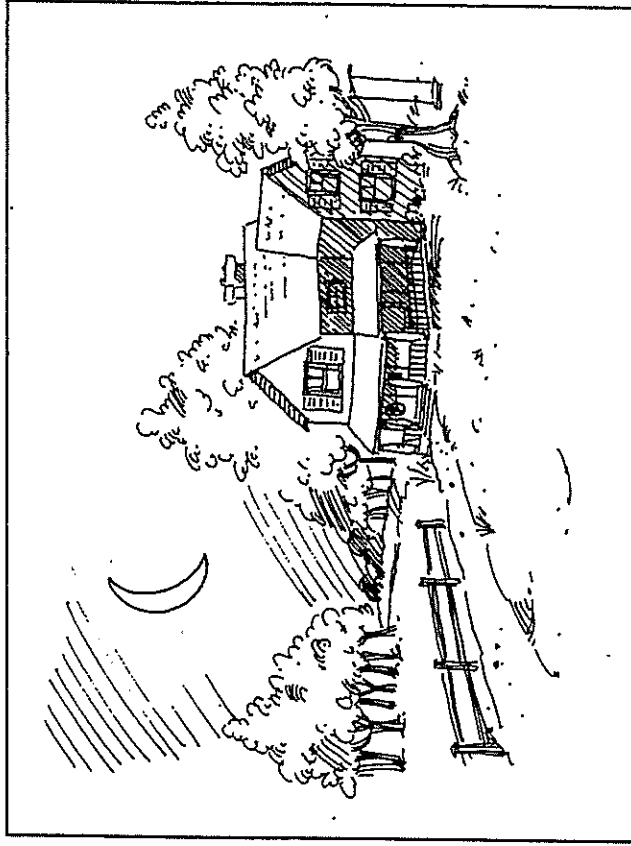
First Quarter

Crescent

Your Favorite Season

Draw the weather for your favorite season.

Write about your favorite season. What is the temperature like? How much sunlight do you get each day?



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