NAME DATE CLASS

Chapter 27

Text Pages 6

ENRICHMENT

• Exploration of the Moon

Interpreting Facts

Use the information in the table and a calculator to help you answer the questions.

Facts about the moon	
Diameter at the equator: 3476 km	Period of rotation: about 27.3 days
Circumference at the equator: 10 920 km	Period of revolution around Earth: about 29.5 days
Density: 3.3 g/cm^3	Length of day and night: about 15 Earth days each
Gravity: 1/6 of Earth's	Temperature: high: 127°C daytime low: −170°C nighttime
Distance from Earth: closest: 356 400 km farthest: 406 700 km average: 384 400 km	Atmosphere: almost none

1. Earth's circumference at the equator is 39 843 km. How many times larger is it than the moon's circumference? _____
2. How many times will the moon revolve around Earth in 92 days? _____
3. How many times will the moon rotate on its axis in 92 days? _____
4. If a rock has a mass of 0.15 kg on the moon, what will its mass be on Earth? _____

   _____

   _____
5. If a colonist weights 800.15 newtons on Earth, what would the colonist weigh on the moon?

   _____
6. Use the average distance to the moon to answer this question. If astronauts travel to the moon and back to Earth again in 144 hours, how many kilometers per hour do they travel?

   _____
7. If the colonists travel at 6000 km/h, how long will it take them to get to the moon from Earth when the moon is at its farthest point from Earth? its nearest point to Earth? Round your answers to the nearest hour. _____
8. How much time would the colonists in Question 7 save if they traveled to the moon when it was at its nearest point rather than its farthest point from Earth? _____
9. With the extremes of temperatures on the moon, what would a colony need to protect its people from the temperatures? _____

   _____

   _____

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The Lunar Cycle

Choose the one best response. Write the letter of that choice in the space provided.

_____ 1. When only a small part of the moon is visible, the moon may be in its:

a. first-quarter phase.
b. new moon phase.
c. waning-crescent phase.
d. last-quarter phase.

_____ 2. Approximately how many days does it take the moon to go through a complete cycle of phases?

a. 7 b. 11 c. 27 d. 29

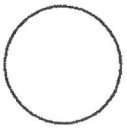
_____ 3. Systems of measuring the passage of time are called:

a. phases. b. calendars. c. years. d. sols.

_____ 4. Prior to the introduction of the Julian calendar, how many days made up a Roman year?

a. 106 b. 197 c. 265 d. 304

_____ 5. Which diagram below shows the moon in a gibbous phase?

a. 
b. 
c. 
d. 

Read each question and answer it in the space provided.

6. What is the major source of the light that reflects off the moon?

7. What term is used to describe a decrease in the visible portion of the moon?

8. What is the time required for the earth to make one complete rotation on its axis?

9. What are years with an extra day called?

10. What is the name of the proposed calendar that would add a day at the end of June every four years?

World Calender

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REINFORCEMENT

• Earth's Moon

Identify each phase of the moon in Figure 1 by writing its name on the line beneath the phase shown. Then answer the questions that follow on the lines provided.

FIGURE 1

1. _____ _____ _____ _____

_____ 2. What phase occurs between the full moon and the third quarter?

_____ 3. What phase occurs between the third quarter and the new moon?

_____ 4. What phase occurs between the new moon and the first quarter?

_____ 5. What phase occurs between the first quarter and the full moon?

Identify Figures 2 and 3 as lunar or solar eclipses. Then explain why each type of eclipse happens and who would be able to see the eclipse.

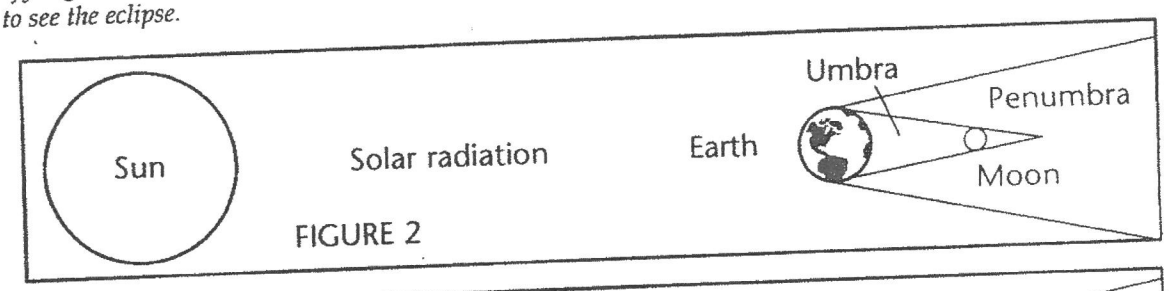

FIGURE 2

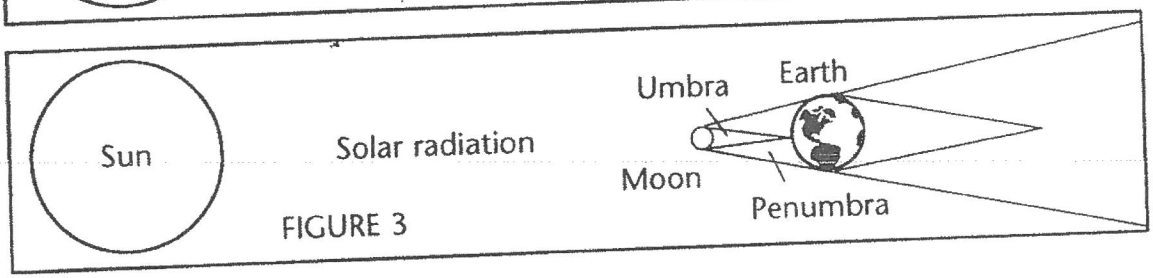

FIGURE 3

6. **Figure 2:** _____

_____

_____

7. **Figure 3:** _____

_____

_____

_____

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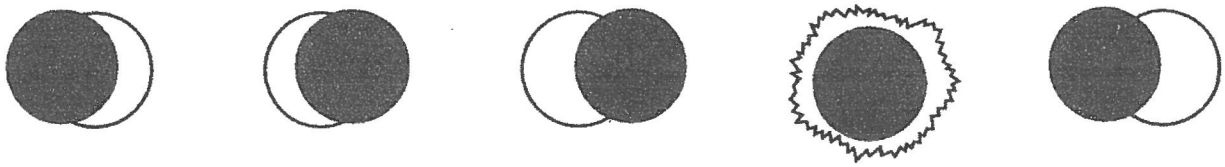
Earth's Moon

Comparing Eclipses

The following observations were made during two eclipses. Beneath each sketch, write a number (1 for first and 5 for last) that shows the order of that observation during the eclipse. Then answer the questions. Note that the moon revolves eastward in its orbit and goes eastward across the sky during an eclipse.

Total solar eclipse



_____ _____ _____ _____ _____

Total lunar eclipse

_____ _____ _____ _____ _____

1. What makes the shadow during a solar eclipse? _____ during a lunar eclipse? _____

2. How are the shapes of the moon during partial stages of the above eclipse different from phase shapes? _____

3. Is the east side or the west side of the sun covered first during a solar eclipse? _____

4. Is the east side or the west side of the moon covered first in a lunar eclipse? _____

5. Which of the above eclipses helps show that Earth is a sphere? Why? _____

6. Why does a lunar eclipse last longer than a solar eclipse? _____

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EARTH SCIENCE

Movements of the Moon

Read each statement below. If the statement is true, write *T* in the space provided. If the statement is false, write *F* in the space provided.

_____ 1. The center of mass of the earth-moon system follows a smooth orbit around the sun.

_____ 2. One side of the moon always faces the earth.

_____ 3. The moon passes closest to the earth at apogee.

_____ 4. In the umbra, sunlight is partially blocked.

_____ 5. Lunar eclipses are visible from any location on the dark side of the earth.

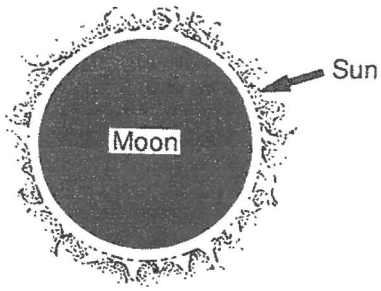
Choose the one best response. Write the letter of that choice in the space provided.

_____ 6. The orbit of the moon around the earth forms:

a. a sphere. **b.** a cone. **c.** a circle. **d.** an ellipse.

_____ 7. What is the difference, in minutes, in the rising time of the moon each day?

a. 10 **b.** 25 **c.** 50 **d.** 90



_____ 8. What type of eclipse is pictured in the diagram?

a. total solar eclipse
b. Solar eclipse
c. penumbral eclipse
d. lunar eclipse

_____ 9. A total solar eclipse lasts no more than seven minutes at any location on earth because:

a. seven minutes is the time it takes for the moon to pass through the earth's penumbra.
b. the earth's rotation causes the area under the shadow of the moon to move rapidly.
c. seven minutes is the time it takes for the moon to pass through the earth's umbra.
d. the moon's spin causes its shadow to move quickly over the earth.

_____ 10. The center of mass of the earth-moon system is at a balance point, which is located:

a. within the earth's interior.
b. less than half the distance from the earth to the moon.
c. within the moon's interior.
d. more than half the distance from the earth to the moon.

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REINFORCEMENT

Exploration of the Moon

Use the following terms in the box to complete the statements

crust	lunar	shadow	thinner
depression	minerals	sunlight	melted
ice deposits	sensors	surface	

1. The *Clementine* spacecraft was placed in _____ orbit.
2. One of its missions was to test new _____ for tracking cold objects in space.
3. It also took photographs for use in making a map of the moon's _____.
4. The South Pole–Aitken Basin is an impact feature, or _____, on the surface of the moon.
5. Information from the *Clementine* helped scientists measure the thickness of the moon's _____.
6. Throughout the moon's rotation, most of the South Pole–Aitken Basin stays in _____.
7. Comets that hit this part of the moon might have left _____ in the basin.
8. *Clementine* also found a large plateau in the area that is always in _____.
9. Scientists think that the ice on this plateau might have _____.
10. The data shows that the moon's crust is _____ on the side of the moon facing Earth.
11. Another kind of information collected by *Clementine* indicates what kinds of _____ make up moon rocks.

Answer the following questions on the lines provided.

12. Why might the South Pole–Aitken Basin be a good place for a solar-powered moon colony?

_____

_____

13. Where did the spacecraft get its name? _____

_____