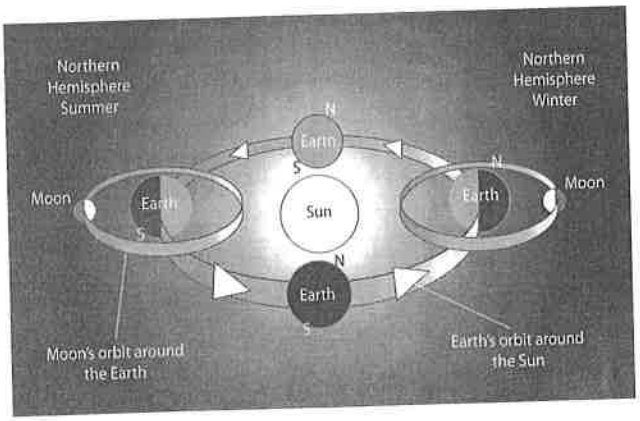
42. Earth, Moon, and Sun

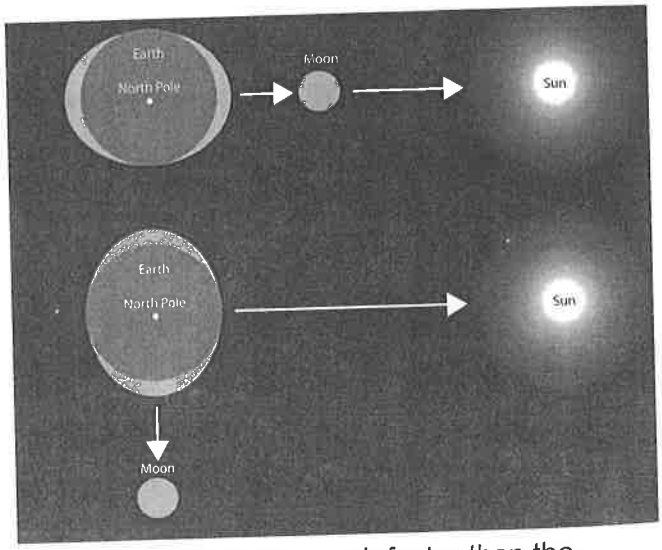
A [1]The sun, Earth, and the moon have a special relationship that causes our days, years, and seasons. [2]Earth takes 365 days (one year) to move on a path, or **revolve**, around the sun. [3]It is always **rotating**, or spinning, as it revolves around the sun at an average distance of 93 million miles (150 million km). [4]The path Earth moves along is an **ellipse**, which looks like a circle that has been stretched. [5]It takes 24 hours (one day) for Earth to rotate on its axis. [6]The **axis** is an imaginary line that goes through Earth from the North and South poles. [7]The part of Earth facing the sun receives light while the other side is dark, which is what gives us day and night.

B [8]The number of hours of daylight changes during the seasons because of Earth's tilt on its axis. [9]It rotates 15 degrees every hour, which is why time zones change by one hour. [10]Earth has 24 **standard time zones** that are approximately 15 degrees wide in longitude. [11]The **International Date Line** is the line of longitude on the globe that is considered the location where a new day begins.



C [12]Many of the planets in the solar system have smaller satellites, or **moons**, that orbit them. [13]Earth has only one moon, which is made of rock and dust. [14]It is about one-quarter of the size of Earth. [15]The moon revolves around Earth once every 28 days (approximately one month) at a distance of 238,866 miles (384,400 km). [16]The moon is kept in orbit by Earth's gravitational pull. [17]It appears to be different shapes as it moves around Earth because the size of the lighted part we see from Earth changes. [18]The **phases** you see depend on the positions of the moon, Earth, and the sun. [19]Only one side of the moon is visible from Earth because it rotates in the same length of time that it takes to revolve around Earth. [20]This is called captured motion.

D [21]The sun and moon pull on Earth, its ocean waters, and even you! [22]Since the moon is almost 400 times closer to Earth, it exerts more pull on the oceans than the sun. [23]The moon's pull is stronger on the water closer to it, which creates a swell, or **high tide**. [24]On the opposite side of Earth, the moon's pull is weaker and forms another high tide. [25]The **low** tides are found midway between the high tides. [26]Study the diagram below of Earth's tides. [27]You can see that Earth becomes somewhat egg-shaped from the force of gravity, which causes high tides on the "front and back" of Earth (as seen from the moon) and low tides on the sides.



[28]Earth's rotations are much faster than the moon's orbit, which is what causes the low and high tides to occur twice per day.

E [29]Eclipses occur when Earth and the moon pass through each other's shadows. [30]Lunar eclipses happen when the moon passes through Earth's shadow and doesn't get sunlight for a short period of time. [31]Solar eclipses happen when Earth is in the moon's shadow and the sunlight is blocked from Earth for a short time.

For each statement, circle T for true and F for false. If the statement is false, replace the **bold word(s)** to make the statement true. Then write the number of the sentence(s) that best supports your answer.

a. T F It takes Earth **24 hours** to revolve around the sun. ____

_____

b. T F The moon revolves around the earth once every **year**. ____

_____

c. T F It takes **one day** for Earth to rotate once on its axis. ____

_____

d. T F **Lunar eclipses** occur when the full moon passes through Earth's shadow. ____

_____

The International Date Line is:

a. where daylight changes to night.
b. the line of longitude on the globe that is considered the location where a new day begins.
c. a place where one season changes to another.
d. a place on the globe where east changes to west.

Write the number of the sentence that best supports your answer. ____

The path in which Earth moves around the sun is a(n):

a. rotation.
b. axis.
c. ellipse.
d. cycle.

Write the number of the sentence that best supports your answer. ____

Refer to the lesson and diagram to explain why the moon keeps the same face toward Earth.

_____

_____

_____

_____

Write the numbers of the sentences that best support your answer. ____, ____

5. How does a solar eclipse compare to a lunar eclipse?

_____

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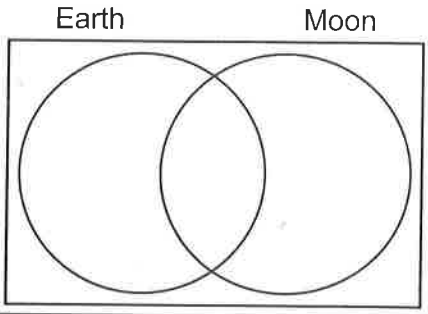
Write the numbers of the sentences that best support your answer. ____, ____

6. Complete the Venn diagram to compare the earth and the moon.



The moon shines because it is reflecting the sun's light. What we see from Earth depends on the angle at which the sun's light is hitting the moon.

7. Refer to the box above and on the next page to explain why a person on Earth cannot see the moon during the new moon phase.

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8. Using the same diagram, explain why the moon seems to change shape during a month.

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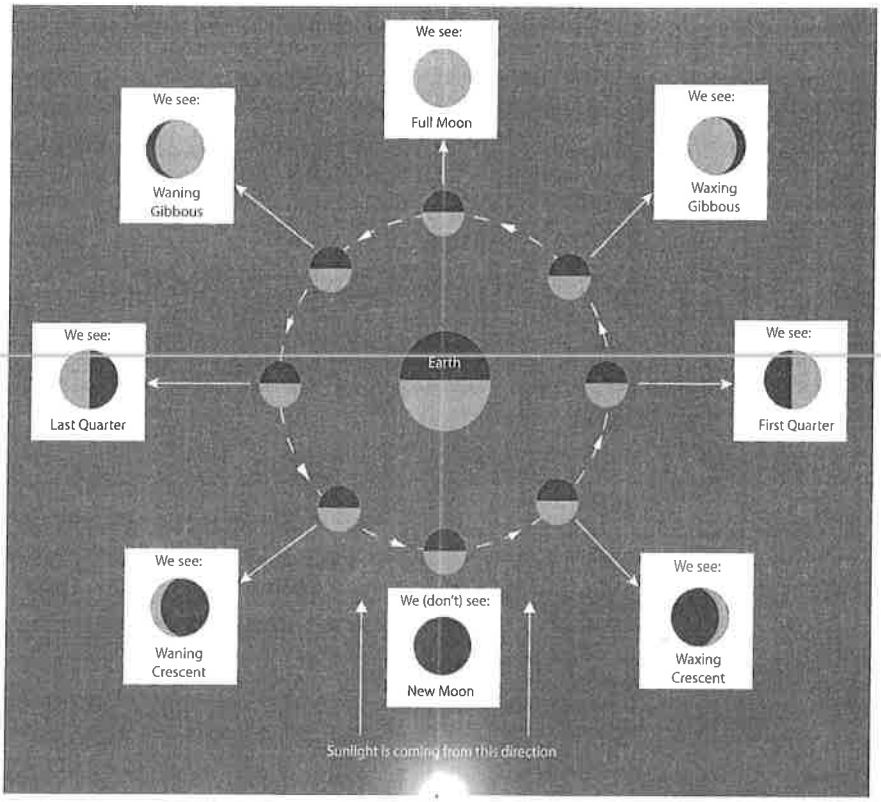

Written Response Questions

For the following two questions, apply all of the information you've learned when answering.

9. How does Earth's rotation cause day and night?

10. Imagine that Earth was not tilted on its axis. What might happen to the seasons?

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