

Unit 6: The Moon

Student Information

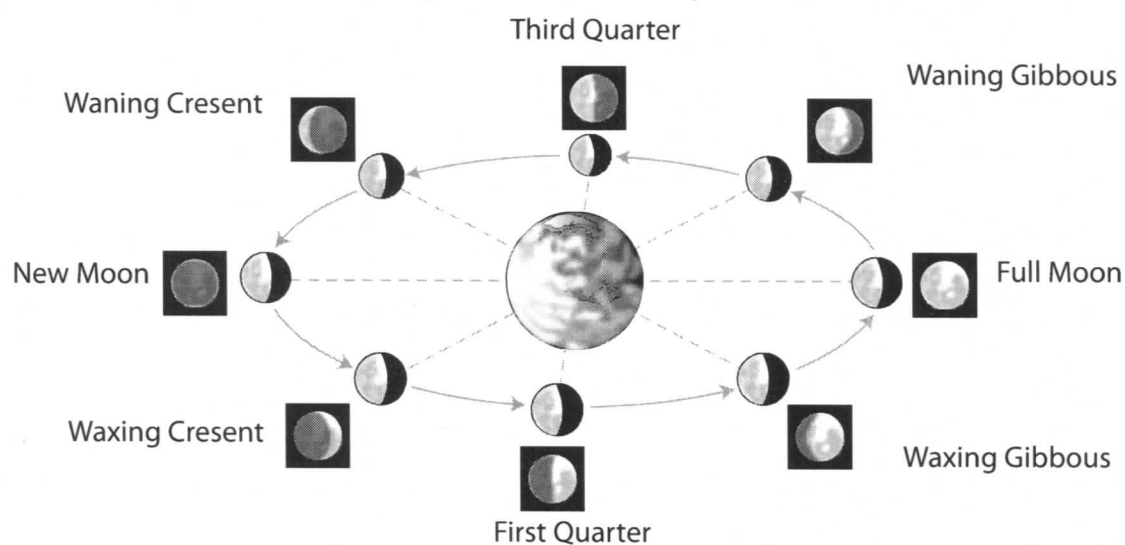
A **satellite** is a small body that orbits around a larger body. The earth has one natural satellite, the moon. The moon orbits the earth once every 27.3 days. It is our closest neighbor at 239,000 miles (384,000 km). The moon's diameter is 2,160 miles (3,476 km) compared to the earth's diameter of 7,926 miles (12,756 km). The moon is one of the largest satellites in the solar system.

The moon's mass is a little over one/one-hundredth (0.0124) that of Earth's, and its gravitational pull is one-sixth the pull of gravity on Earth. As a result, there is no air on the moon. However, the moon's gravity causes tides on the earth; it causes the water in the oceans to rise and fall twice daily.

While several theories exist as to the formation of the moon, one of the most popular assumes that a large unknown object struck the earth many years ago, blasting material away from the earth. This material was captured in the earth's gravitational orbit, thus forming the moon.

Many of the moon's features are of interest to us because we can see them through binoculars and small telescopes. The most obvious features on the lunar surface are the **maria**. These are large, dark areas that were mistaken for seas and oceans by early observers. The moon's surface is also covered with **craters**. Craters are roughly circular, bowl-shaped holes. It is thought that the craters were formed by the impacts of vast numbers of rocky bodies that crashed into the moon's surface during its early history. Because the moon has no atmosphere, wind, surface water, or other erosion forces, the impact of space debris creates features that remain unchanged through time.

Daily observations of the moon reveal a slight change in the moon's appearance from one day to the next. These changes are due to the rotation of the moon around the earth and the earth's rotation around the sun. These changes are known as the **phases of the moon**.



Name: _____ Date: _____

Quick Check

Matching

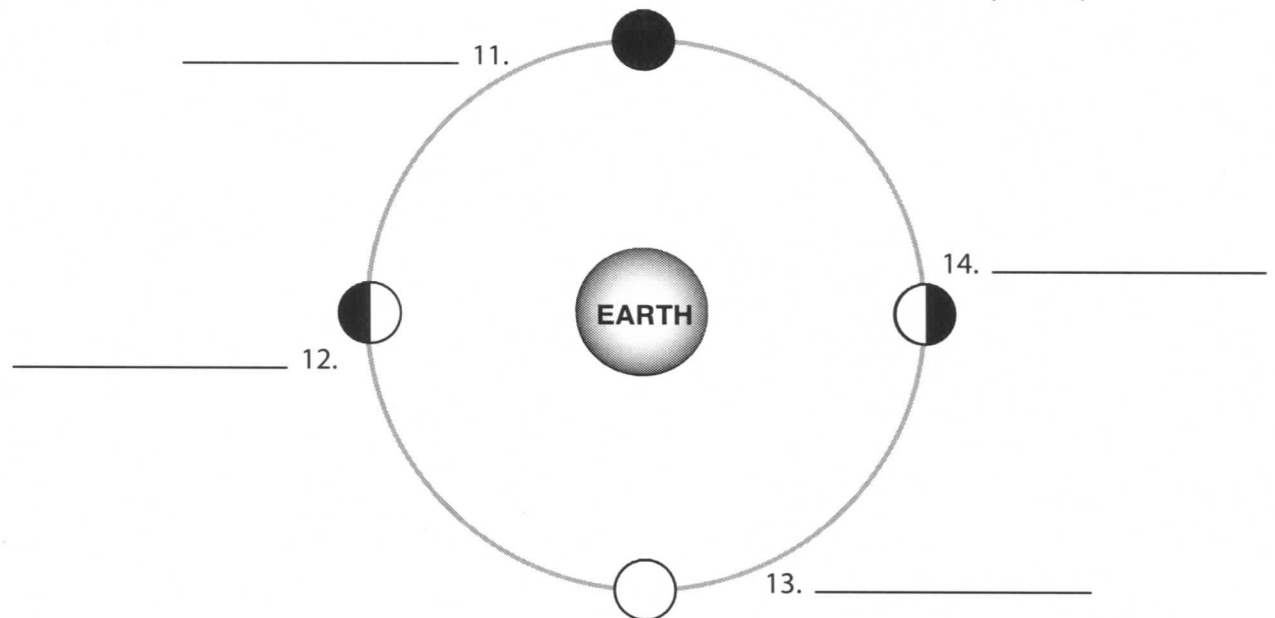
- | | |
|--------------------|--|
| _____ 1. craters | a. small body that orbits around a larger body |
| _____ 2. tides | b. natural satellite of Earth |
| _____ 3. maria | c. large, dark areas on the moon |
| _____ 4. moon | d. bowl-shaped holes on the moon |
| _____ 5. satellite | e. rise and fall of the ocean water |

Fill in the Blanks

- The earth has one natural _____, the moon.
- The moon's _____ causes tides on the earth; it causes the water in the oceans to rise and fall twice daily.
- The most obvious features on the lunar surface are the _____.
- The moon has no _____, wind, surface water, or other erosion forces.
- Changes in the appearance of the moon are due to the _____ of the moon around the earth and the earth's _____ around the sun.

Label

The diagram below shows four phases of the moon as seen from Earth. Identify each phase.



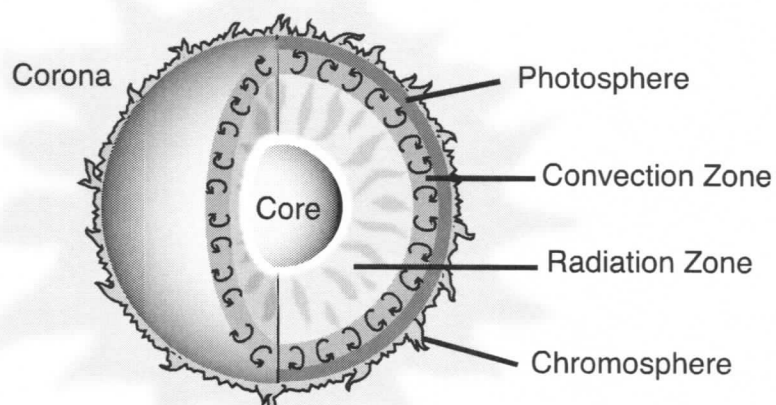
Unit 4: The Sun

Student Information

The sun is by far the largest heavenly body near the earth. It is so large that even the largest planets are tiny by comparison. The sun generates its own light, and we depend on that light for many things. Sunlight not only brightens our world, but also causes plants to grow and drives the weather processes that bring us winds, clouds, rain, and snow. Without the sun, life on Earth would not be possible. Also, without the sun, we would not be able to see the moon and other planets. The moon and planets do not create their own light. We see them because of the sunlight that reflects off their surfaces.

Although we usually think of our sun as being something special, it is really just an ordinary star. Compared to the rest of the solar system, however, it is something special. The sun contains about 98% of the mass of the solar system and provides almost all of its energy. Its diameter is about 110 times the diameter of the earth.

The center portion or **core** of the sun is a blazing furnace where hydrogen is being converted into helium. The conversion process is the same one that goes on in a hydrogen bomb, and the temperature in the core is a toasty 15 million degrees Celsius! Several layers above the core, energy is transported upward toward the surface of the sun to the part we call the **photosphere**.



The photosphere is the bright disk that we see when we look toward the sun. We might think of it as the "surface" of the sun. It is only about 500 km thick, and its temperature is about 6,000 degrees Celsius, much cooler than the core. Upward currents of hot gases carry energy up to it from lower layers. Outer layers of the sun above the photosphere are called the chromosphere and the corona. The **chromosphere** is the layer above the photosphere where large amounts of hydrogen and other gases are erupted. The **corona** is a layer of ionized gas that lies outside the chromosphere. It can only be seen as a faint halo during a total eclipse of the sun.

Name: _____ Date: _____

Quick Check

Matching

- | | |
|-----------------------|--|
| _____ 1. photosphere | a. center portion of the sun |
| _____ 2. sun | b. "surface" of the sun |
| _____ 3. corona | c. layer above the photosphere |
| _____ 4. core | d. lies outside the chromosphere |
| _____ 5. chromosphere | e. 110 times the diameter of the earth |

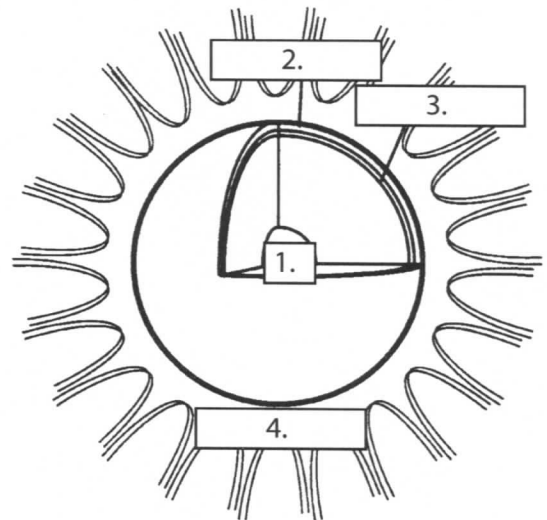
Fill in the Blanks

6. The sun is by far the _____ heavenly body near the earth.
7. Without the sun, _____ on Earth would not be possible.
8. The center portion or _____ of the sun is a blazing furnace where _____ is being converted into _____.
9. The temperature of the sun's core is a toasty _____.
10. The _____ is the bright disk that we see when we look toward the sun.
11. The _____ is the layer above the photosphere where large amounts of hydrogen and other gases are erupted.

Label

Examine the illustration of the sun. Identify the parts of the sun and write your answer on the lines below.

1. _____
2. _____
3. _____
4. _____



The Sun