

CHAPTER  
**22**

**GEOGRAPHY APPLICATION: LOCATION**

## Three Theories of the Solar System

**Section 1**

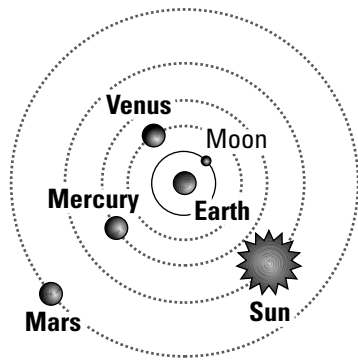
*Directions: Read the paragraphs below and study the illustrations carefully. Then answer the questions that follow.*

In the second century A.D., Claudius Ptolemy, an astronomer who lived in Egypt, claimed that the sun, stars, and other planets revolved around the earth. These ideas were unchallenged nearly 1,300 years until Nicolaus Copernicus, a Polish astronomer, discovered his revolutionary theory about the sun.

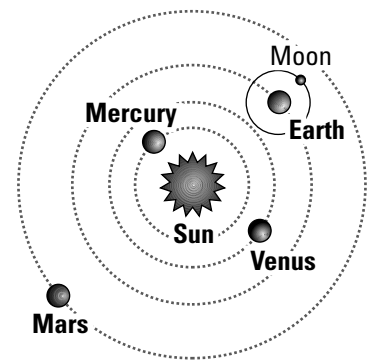
Ptolemy had believed in his geocentric or earth-centered view for several reasons. First, because of gravity all objects were attracted to the earth, which suggested to him that the earth must be the center. Second, he thought that the earth did not move. He showed how an object is thrown in the air and falls in practically the same place. If the earth moved, he theorized, that object should fall in a different place. Even today, these arguments would be difficult to disprove by observation. As a result, Ptolemy's views remained undisputed for centuries.

During the 1500s, Copernicus did not accept the Ptolemaic view. He became convinced that a different explanation of the solar system existed. After 25 years of observation, Copernicus concluded that the sun was the center of the solar system and that the planets, including the earth, revolved around the sun in "perfect divine circles."

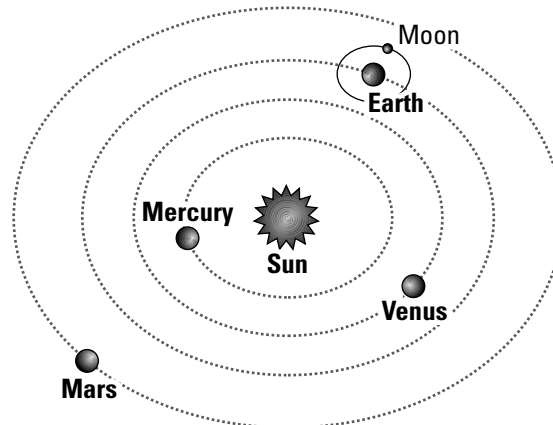
Copernicus's conclusion at first went practically unnoticed. However, in the 1600s a German astronomer, Johannes Kepler, supported Copernicus's belief with mathematics. He also proved that the planets travel in ellipses (ovals), not perfect circles, around the sun. Both Copernicus's and Kepler's breakthroughs laid the foundation of modern day knowledge of the solar system.



**PTOLEMY**



**COPERNICUS**



**KEPLER**

### Interpreting Text and Visuals

1. What object did Ptolemy claim was at the center of the universe? \_\_\_\_\_

2. What object did Copernicus conclude was actually at the center of the universe? \_\_\_\_\_

3. What object is farthest from the center in all three systems? \_\_\_\_\_

4. What object is closest to the earth in all three systems? \_\_\_\_\_

\_\_\_\_\_

5. According to Ptolemy, where was the sun in relation to Earth and the other planets? \_\_\_\_\_

\_\_\_\_\_

6. According to Copernicus, what planets are located between the sun and the Earth? \_\_\_\_\_

\_\_\_\_\_

7. What is the main difference between Kepler's system and the Copernican system? \_\_\_\_\_

\_\_\_\_\_

8. Compare the way Ptolemy provided proof for his theory with the way Kepler provided proof for his theory. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Do you think Ptolemy's proof of his beliefs would be acceptable today? Why or why not?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_