

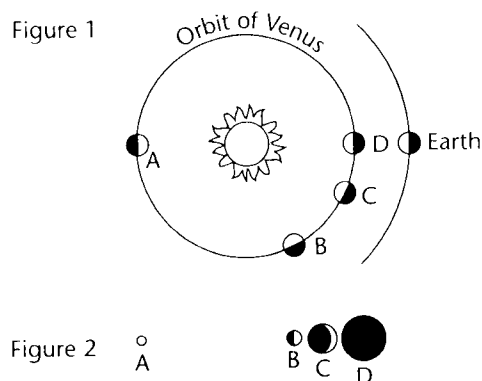
The Solar System ▪ Enrich

The Phases of Venus

Why did Galileo infer that the phases of Venus are a result of that planet's moving around the sun rather than around Earth? After all, the moon has phases, and it revolves around Earth. The answer lies in how Venus's apparent shape and size change. Figure 1 shows Venus at several places in its orbit. Figure 2 shows how Venus would appear at these places if viewed with a telescope from Earth.

The phases of Venus look a lot like those of the moon, including full, half, crescent, and new. There is an important difference, though. The full Venus looks less than half as wide as the crescent Venus. This means that when it is full, Venus is much farther away from Earth than when it is crescent or new. Galileo also knew that Venus is called the *morning star* or the *evening star* because it is never very far from the sun in the sky.

Combining these observations, Galileo reasoned that Venus must revolve around the sun.



Answer the questions below or on a separate sheet of paper.

1. How is the position of the full moon in relation to Earth and the sun different from the position of the full Venus in relation to Earth and the sun? Does the apparent size of the moon change with its phases?
2. Where is the moon located, relative to Earth and the sun, when it is new? What about Venus?
3. The moon has phases, too. Why doesn't that make us think the moon revolves around the sun, rather than around Earth?