Name: _____ Date: _____

Venus Changed Shape Through Galileo's Telescope

Circle group

In 1610, a scientist named Galileo pointed a new telescope at Venus. He saw something odd. Over some months, Venus changed shape. Sometimes it looked like a small, round disk. Other times it looked like a big, thin crescent. These changes are called phases. The Moon has phases too.

Galileo saw that the phases were a clue. Venus makes no light of its own. It shines because the sun lights up one side of it. The sun does this for the Moon too. As Venus moves in its orbit, we see more or less of the lit side.

In those days, many people thought the sun and planets circled Earth. In that idea, Venus moved on a small path between Earth and the sun. From Earth, it would only look like a crescent. It could never look full and round.

But Galileo saw a nearly full Venus. That did not fit the old idea. It made sense only if Venus goes around the sun. When Venus is on the far side of the sun, we see its whole lit face. It looks small because it is far away. When it comes closer to Earth, it looks bigger. But most of the lit side points away from us.

A small telescope and careful drawings gave strong evidence about how planets move.

Questions

1. What did Galileo see Venus do in 1610?

_____

_____

2. What are these changes in shape called?

_____

_____

3. Why does Venus shine?

_____

_____

4. What did many people think about the planets in those days?

_____

_____

5. Why did a nearly full Venus not fit the old idea?

_____

_____

6. Why does Venus look small when we see its whole lit face?

_____

_____

Words to know

crescent: a thin curved shape, like a new moon
phases: the different shapes the lit part of a moon or planet seems to have
orbit: the path a planet takes around the sun
evidence: facts that help show something is true

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Venus Changed Shape Through Galileo's Telescope

Triangle group

In 1610, the Italian scientist Galileo Galilei pointed a new telescope at Venus and noticed something puzzling. Over several months, Venus changed its shape. Sometimes it looked like a small, round disk. At other times it looked like a thin, large crescent. These changes, called phases, are the same kind we see on the Moon each month.

Galileo realized that the phases held an important clue. Venus makes no light of its own. It shines because the sun lights up one side of it, just as the sun lights up half of the Moon. As Venus travels in its orbit, we see different amounts of the lit side.

In those days, many people believed that the sun and all the planets circled Earth. According to that idea, Venus moved on a small path between Earth and the sun. Seen from Earth, it would always show only a crescent or a thin sliver. It could never look like a full, round disk.

Galileo saw a nearly full Venus, and that did not fit the old idea. It made sense only if Venus travels around the sun. When Venus is on the far side of the sun, we see its whole lit face, but it looks small because it is far away. When it swings closer to Earth, it looks bigger, but most of the lit side points away from us.

A small telescope and careful drawings were enough to give astronomers strong evidence about how the planets move.

Questions

1. What did Galileo notice about Venus in 1610?

_____

_____

2. What are these changes in shape called?

_____

_____

3. Why does Venus shine?

_____

_____

4. What did many people believe about the planets in those days?

_____

_____

5. Why did a nearly full Venus not fit the old idea?

_____

_____

6. Why does Venus look small when it shows its whole lit face?

_____

_____

Words to know

crescent: a thin curved shape, like a new moon
phases: the different shapes the lit part of a moon or planet seems to have
orbit: the path a planet takes around the sun
evidence: facts that help show something is true
sliver: a very thin piece

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Venus Changed Shape Through Galileo's Telescope

Square group

In 1610, the Italian scientist Galileo Galilei aimed a newly made telescope at Venus and observed something genuinely puzzling. Over the course of several months, the planet's appearance kept changing. At certain times it resembled a small, round disk, while at others it looked like a large, slender crescent. These changes, known as phases, are the same kind that the Moon displays every month.

Galileo recognized that the phases supplied an important clue. Venus produces no light of its own. It shines because the sun illuminates one side of it, exactly as the sun illuminates half of the Moon. As Venus travels along its orbit, we are able to see varying amounts of the lit side.

In those days, many people believed that the sun and every planet revolved around Earth. According to that notion, Venus followed a small path between Earth and the sun. Viewed from Earth, it would always display only a crescent or a thin sliver, and it could never appear as a full, round disk.

Galileo, however, observed a nearly full Venus, and that observation contradicted the old idea. It made sense only if Venus circles the sun. When Venus lies on the far side of the sun, we see its entire lit face, although it looks small because it is so distant. When it swings nearer to Earth, it appears much larger, yet most of its lit side faces away from us.

A modest telescope and careful drawings were sufficient to give astronomers powerful evidence about how the planets move.

Questions

1. What did Galileo notice about Venus in 1610?

_____

_____

2. What are these changes in appearance called?

_____

_____

3. Why does Venus shine?

_____

_____

4. What did many people believe about the planets in those days?

_____

_____

5. Why did a nearly full Venus contradict the old idea?

_____

_____

6. Why does Venus look small when it shows its entire lit face?

_____

_____

Words to know

crescent: a thin curved shape, like a new moon
phases: the different shapes the lit part of a moon or planet seems to have
orbit: the path a planet takes around the sun
evidence: facts that help show something is true
sliver: a very thin piece

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

For the teacher: Venus Changed Shape Through Galileo's Telescope

Each student sheet carries a shape, not a level. The same topic and facts, written three ways.

Circle: Venus Changed Shape Through Galileo's Telescope

Easier · 219 words · Flesch-Kincaid grade 3.1

1. It changed shape from a small round disk to a big crescent.
2. Phases.
3. The sun lights up one side of it.
4. That the sun and planets circled Earth.
5. In the old idea, Venus would only look like a crescent.
6. It is on the far side of the sun, so it is far from Earth.

Triangle: Venus Changed Shape Through Galileo's Telescope

This passage · 246 words · Flesch-Kincaid grade 5.7

1. Its shape changed from a small round disk to a large crescent.
2. Phases.
3. The sun lights up one side of it.
4. That the sun and planets circled Earth.
5. In the old idea Venus would only ever look like a crescent or thin sliver.
6. It is on the far side of the sun, so it is far away from Earth.

Square: Venus Changed Shape Through Galileo's Telescope

Harder · 254 words · Flesch-Kincaid grade 8.6

1. Its appearance changed from a small round disk to a large, slender crescent.
2. Phases.
3. The sun illuminates one side of it.
4. That the sun and every planet revolved around Earth.
5. In the old idea Venus would only ever show a crescent or a thin sliver.
6. It lies on the far side of the sun, so it is very distant from Earth.