

Phases and Transits of Venus Activity

Some helpful websites:

Wikipedia Phases of Venus, http://en.wikipedia.org/wiki/Phases_of_Venus
Wikipedia Elongation, [http://en.wikipedia.org/wiki/Elongation_\(astronomy\)](http://en.wikipedia.org/wiki/Elongation_(astronomy))
Wikipedia Transit of Venus, http://en.wikipedia.org/wiki/Transit_of_Venus
Transit of Venus History, <http://www.transitofvenus.org/history>

1. Briefly describe the history of the first observations of the phases of Venus.
2. Why did Galileo's observations support the heliocentric model of the solar system and refute the Ptolemaic model?
3. Access and experiment with the Phases of Venus Simulator. Both Venus and the Earth can be dragged along their orbits. Line them up so that the Earth, Venus, and the Sun are in a straight line in that order. Complete the first row of the table below.
4. Now drag Venus slowly counterclockwise along its orbit until an Earthling would see exactly half of Venus lit up by the Sun. As you move Venus, note how the elongation value changes. Stop moving Venus when it reaches the maximum elongation value.
5. Hold a straight piece of paper, at least 6 inches long, along the line formed with Earth at one end and Venus at the other. The paper should touch Venus' orbit only at Venus' current location, not cross any other part of its orbit. Complete the second row of the table below.
6. Now move Venus so that the Earth, the Sun, and Venus are in a straight line, in that order. Complete the third row of the table below.
7. Continue to move Venus slowly counterclockwise along in its orbit, so that it begins to "catch up" with the Earth, until an Earthling would see exactly half of Venus lit up by the Sun. As you move Venus, note how the elongation value changes. Stop moving Venus when it reaches the maximum elongation value.
8. Again, hold a straight piece of paper, at least 6 inches long, along the line formed with Earth at one end and Venus at the other. The paper should touch Venus' orbit only at Venus' current location, not cross any other part of its orbit. Complete the last row of the table below.

Venus' Position and Appearance from Earth

A	B	C	D
Position of Venus	Earth-Venus distance in AU	Venus' elongation in degrees	Phase of Venus seen from Earth
Inferior conjunction			
Greatest western elongation			
Superior conjunction			
Greatest eastern elongation			

9. List two reasons why it is difficult to observe Venus at inferior conjunction.
 - a.
 - b.

10. Explain why Venus cannot be observed at superior conjunction.

11. On June 8, 2004 and June 5, 2012, Venus passed directly between the Earth and the Sun. What term do astronomers use to refer to this event?

12. Access the Transit of Venus History website. Complete the following table. For each of the dates given briefly describe the methods used to observe the transit, and what was learned by the observers.

History of the Transits of Venus

Transit dates	Observations, discoveries, etc.
1639	
1761 & 1769	
1874 & 1882	
2004 & 2012	