

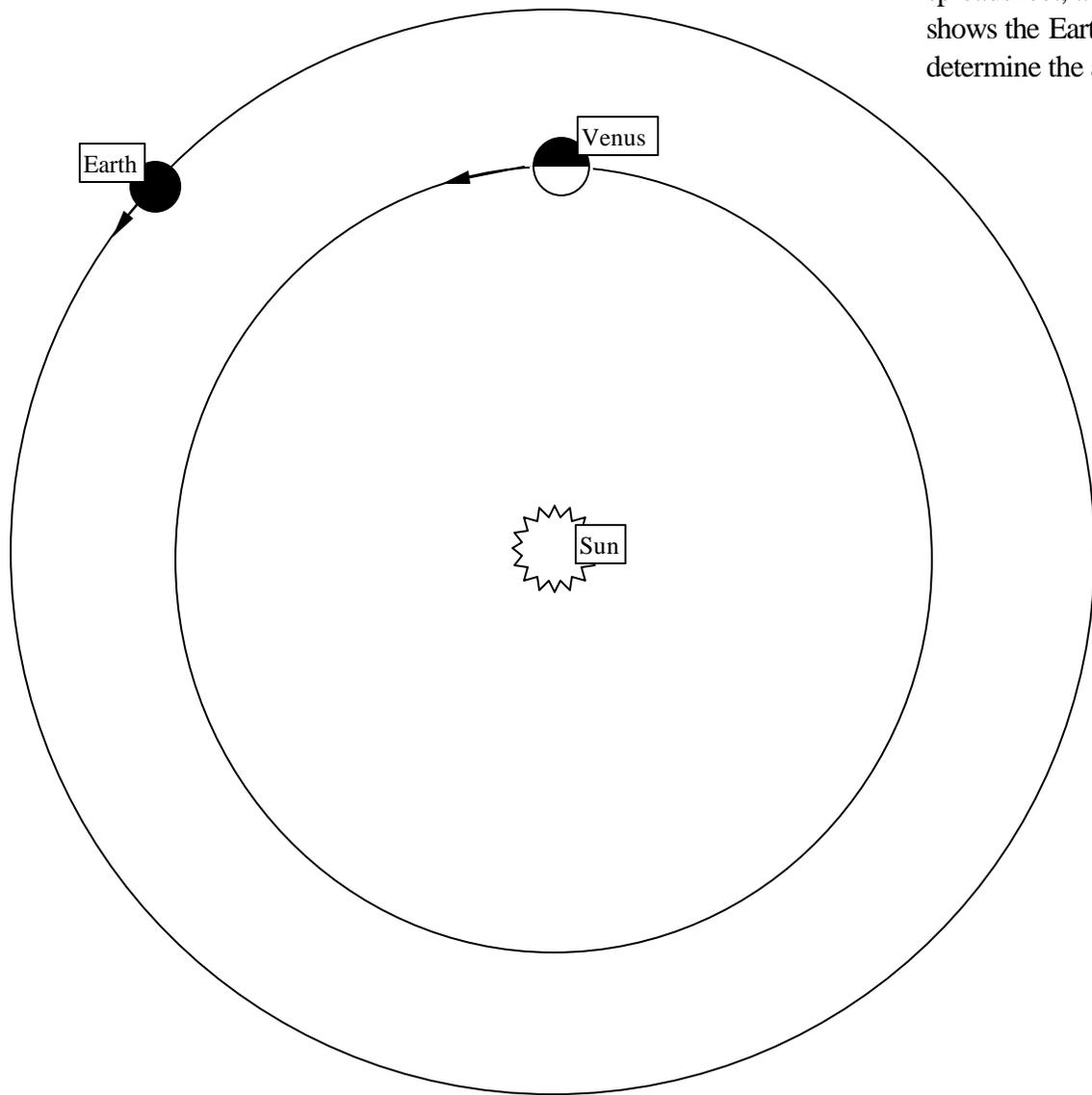
THE ORBIT OF VENUS

NAME _____

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The inner planets of the solar system go through cycles of phases similar to those of the Moon. In this lab you will determine the phases of the planet Venus as viewed from Earth during the course of one year.

Using any reference materials you might need, a calculator or better yet a spreadsheet, a protractor, a ruler, and the diagram to the left (which shows the Earth's and Venus's orbits drawn to scale), fill in the blanks and determine the answers to the questions below:



Earth Revolves around the Sun once every _____ days, or _____°/day.

Venus revolves around the Sun once every _____ days, or _____°/day.

Therefore, Venus gains _____° of revolution on the Earth each day. If the Earth stood still, Venus would *appear* to revolve _____°/day around the Sun.

In 40 days, then, Venus would appear to revolve _____° around the Sun if the Earth stood still.

Plot the position of Venus on the diagram, moving counterclockwise around the Sun, at 40 day intervals.

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The starting position of Venus in the diagram is called its “greatest eastern elongation”. Using a recent astronomy book or the internet, find the date of the most recent “greatest eastern elongation” of Venus, and label the diagram with the date.

Calculate and label the date at each of the positions you plotted on the diagram.

Construct a chart similar to the one we made in the Moon Phase Lab of the phases of Venus as it makes it’s trip around the Sun.

The chart should have 3 columns: Date Phase Appearance The appearance column should be a diagram of how Venus would appear when viewed from Earth.

Notice that while the Earth/Moon distance doesn’t vary a great deal, the Earth/Venus distance varies greatly. Your “Appearance” diagrams should reflect the apparent change in size (or diameter) of Venus as well as the phase.

ANSWER THE FOLLOWING QUESTIONS:

1. Which side (left or right) of Venus is illuminated as Venus waxes?_____ As Venus wanes?_____
2. Why is it unlikely that anyone will ever observe a “full” Venus?_____

3. On what day (approximately) will Venus pass between the Earth and the Sun?_____. Venus passes across the Sun (transits the Sun) once every 1.6 years, yet the Sun is never eclipsed by Venus. Why don’t transits of Venus produce eclipses on earth?_____

4. The phases of Venus can not be seen with the naked eye, but Venus appears much brighter in the sky at its crescent phase than at its gibbous phase. How can the fact that crescents are brighter be explained?_____

5. Because Venus orbits closer to the Sun than the Earth, it is always found within about 45° of the Sun. When Venus is east (to the left) of the Sun, when will it best be viewed? (*before sunrise in the morning* or *after sunset in the evening*).
6. When Venus is left (east) of the Sun, it is sometimes called “The Evening Star”. Is Venus waxing or waning when it is the “Evening Star”?_____ Explain!_____

7. When will Venus next be visible as an Evening Star?_____