**Models of Eclipses** Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Background information**

As the moon and the Earth revolve around each other and the sun, they block some of the sun’s light. When the sun or moon is blocked out by another object, an eclipse occurs. There are two types of eclipses – a lunar eclipse and a solar eclipse. During a lunar eclipse, the moon passes through the Earth’s shadow. A solar eclipse occurs when the moons is directly between the sun and Earth.

Shadows cast into space during an eclipse have two parts. The completely dark inner shadow is the **umbra.** The outer area where light is only partially blocked is called the **penumbra.**

In this investigation you will draw a model of a solar eclipse and of a lunar eclipse and identify the parts of a shadow.

**Problem**

What happens during a solar and a lunar eclipse? What are the parts of the shadows they form?

**Materials**

Ruler and colored pencils (black or pencil and purple, blue, orange, green)

**Procedure**

1. Each step of the procedure should be done on the appropriate figure in the lab sheet.
2. Color the sun orange, the moon blue, and the Earth green in Figures 1 and 2.
3. On figure 1, use the ruler to draw a line from each side of the sun to the same side of the moon. Extend these lines until they intersect or reach the Earth. The visual below is a guide for how to draw the two lines on the lab sheet.
4. On the SAME figure, use a ruler to draw lines from the same points on the sides of the sun to opposite sides of the moon. Extend these lines until they intersect with the Earth. The visual below is guide for how to draw the lines. (your figure now has 4 lines)
5. Color the umbra black and the penumbra purple.
6. On Figure 2, use the ruler to draw a line from each side of the sun to the same side of the Earth. Extend the lines 4 cm beyond the earth. The visual below is a guide for how to draw the two lines on the lab sheet.
7. On the same figure 2, use the ruler to draw lines from sides of the sun to the opposite sides of the earth. Extend these lines 4 cm beyond the Earth. The visual below is guide for how to draw the lines. (your figure now has 4 lines)
8. Color the umbra black and the penumbra purple.

**Lab Data Sheet**

Figure 1

Figure 2

Analysis and Conclusions – Answer in complete sentences on your own sheet of paper.

1. What type of eclipse have you drawn in Figure 1?
2. What type of eclipse have you drawn in Figure 2?
3. Which type of eclipse occurs with the greatest frequency?
4. Explain why a total solar eclipse or total lunar eclipse does not occur at least once a month.
5. If you were a lunar inhabitant, what kind or kinds of eclipse(s) might you expect to see?
6. Name the planets that could experience eclipses of the sun.
7. Why does our moon, which much smaller than our sun, produce a total eclipse of the sun?