The Earth-Moon-Sun system (second try)

January 19, 2006

The goal of this lab is to help you understand how the motion of the Moon around the Earth produces the lunar phases and eclipses that we see. You will be using a small orange to represent the Moon, yourself as the Earth and a flashlight as the Sun.

First of all: stand up! It makes it a lot easier to move around and keep everything oriented correctly. During the exercise, keep the flashlight pointed toward the Moon, not the face of the person representing the Earth. Keep the navel of the orange pointed toward the "Earth's" eyes. Move the moon from right to left (counterclockwise as viewed from above), as this represents the actual motion of the Moon around the Earth, as viewed from "above."

Waxing growing, from right side.

Waning shrinking, from right side.

Questions:

1. What configuration (sketch what it looks like when viewed from above) produces a
   (a) solar eclipse?
   (b) lunar eclipse?
   (c) full moon?
   (d) new moon?
   (e) crescent moon?
   (f) waning/waxing half moon?
2. Some lunar phases are drawn on the board: set up the configuration that produces each phase.
3. What time(s) of day would you expect to see a
   (a) lunar eclipse?
   (b) full moon?
   (c) new moon?
   (d) waning crescent moon?
   (e) waxing half moon?
4. How much of the moon is lit at any given time?
5. What are some problems with the model that we used?
6. How should we modify this to use with 6th grade students?