

Station # 3: The Moon

Introduction

The moon travels in a regular and predictable motion around the Earth. This motion explains why we see different “pictures” of the moon each night we look up. **Moon phases** are daily changes in the moon’s appearance as viewed from Earth. Much like the sun, the moon appears to rise and set; however this does not really happen, but rather the moon is orbiting the earth so as the Earth rotates on its axis it makes the moon appear to rise and set.

- Open the Lunar Phase Simulation found on the computer at <http://astro.unl.edu/naap/lps/animations/lps.swf>.
- Begin by putting the animation rate (found at the bottom left side of the screen) in the middle and by clicking on “show time tickmarks” found in the diagram options box (middle-bottom part of the screen).
- Complete the following questions by using the animation and writing your answers in full sentences.

Investigation Question: Why do we see phases of the Moon?



1. Adjust the moon phase to “New Moon” on the simulation by using the drop down menu found at the top right of the screen. Do not press start; however instead look at the simulation diagram as well as the moon phase diagram in the top right corner of the page. Explain what we see from Earth during the time there is a new moon, or the “beginning” of the moon phases. Explain why we see this and what causes it to occur.
2. Begin the simulation and allow it to run until you see the moon phase change to waxing crescent, at this time press pause. Explain what has changed since the time of the new moon. What has caused this to change?
3. Allow the simulation to run until the phase changes to first quarter. Explain what you see during this time, and what the position of the moon is at the time. As well indicate how long it took to get to this phase from the time of the new moon.
4. Allow the simulation to run until the phase of the moon changes to a full moon. Explain what you would be able to see from the Earth, what does it look like? Explain why you can see this.
5. Allow the simulation to run until it is just about to change to a new moon phase again (hint: you can use the increment adjustments to get it exact). How long has it taken for the moon to go through all of its phases, and go around the Earth one full time? What calendar event coincides with the revolution of the Moon around the Earth?
6. Based on your observations, what two reasons cause us to be able to see moon phases?
7. Based on your observations, what would you say is the difference between a waxing moon and a waning moon?
8. The moon revolves around the Earth; however does not revolve around the sun except in the Earth’s orbit. In watching the simulation which object (Moon or Earth) rotates on its axis faster. Hint: watch the movement of the dark spot on the moon. How long would you say the Moon’s rotation is?
9. Do we always see the same side of the moon? How do you know?

