

student activity 2

The Phases of the Moon and the Earth

Objective:

- To observe the phases of the Moon, and to observe the Moon and Earth from various perspectives.

Materials Needed:

- "Orbit of the Moon" sheet
- Sun model (yellow ball)
- Earth model (blue and black ball)
- Moon model (black and white ball)
- 3 caps
- Your notes on the phases of the Moon (previous page)

Procedure:

1. Place each model (Sun, Earth, and Moon) on an inverted cap. This will keep the models from rolling around while you work with them.
2. Find the "Orbit of the Moon" sheet. Place the Sun model on the spot on the sheet labeled "Sun". Place the Earth model on the dot labeled "Earth." Make sure you place the Earth model so that the blue side, representing daylight, faces the Sun. Place the Moon model on top of position 1 on the sheet. Make sure you place the Moon model so that the black side faces the Earth.
3. Keep the following rules in mind throughout this exploration:
 - The white side of the Moon should always face the Sun side of the orbit sheet. In order to achieve this, you must not turn or rotate the Moon.
 - For a portion of this activity, you will be asked to observe the Moon from the perspective of an observer on Earth. As such, you will need to move out of your chair and crouch down to observe the Moon model at eye-level from the Earth's perspective, as shown in Figure 1. You will also need to move around the circle, to a point directly opposite the Moon model, as shown in Figure 2. For instance, when the Moon is at Position 1, you should observe it at eye-level from Position 5; when the Moon is at Position 2, you should observe it from Position 6, and so on.
 - When identifying each phase of the Moon, be sure to note whether the Moon is waxing or waning, gibbous or crescent, full or new, or first or third quarter, as appropriate.

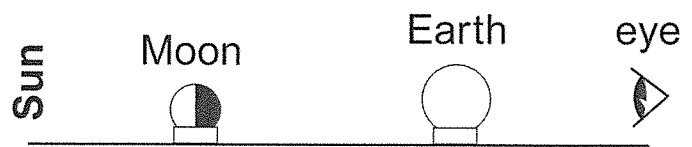


Figure 1

(continued on next page)

student activity 2

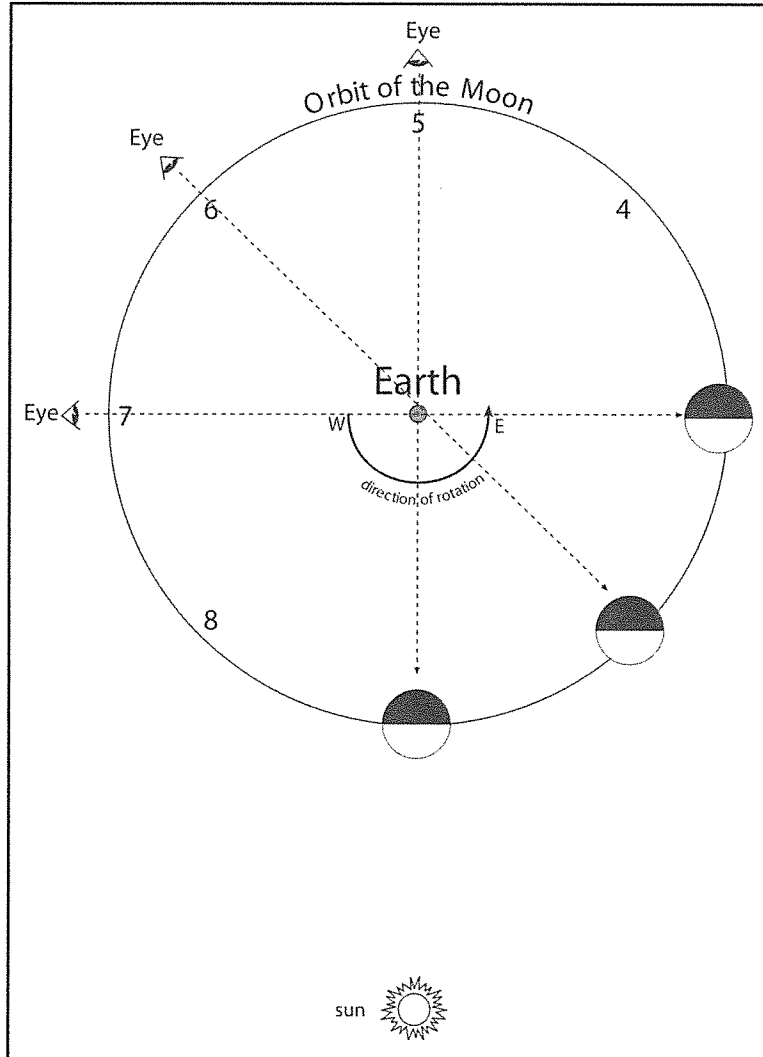


Figure 2

4. On the worksheet (page S14), answer the questions for Position 1.
5. Without rotating the model, move the Moon counterclockwise from position 1 to position 2 along the Moon's orbital path, as shown in Figure 2. Answer the worksheet questions for Position 2.
6. Without rotating the model, move the Moon counterclockwise to the next position along the Moon's orbital path, as shown in Figure 2. Answer the worksheet questions for the next position.
7. Repeat step 6 for all of the remaining positions on the "Orbit of the Moon" sheet, until you have completed the entire orbit and are back at Position 1. Be sure to answer all the questions for each position and fill in the diagrams on the worksheet (page S18).