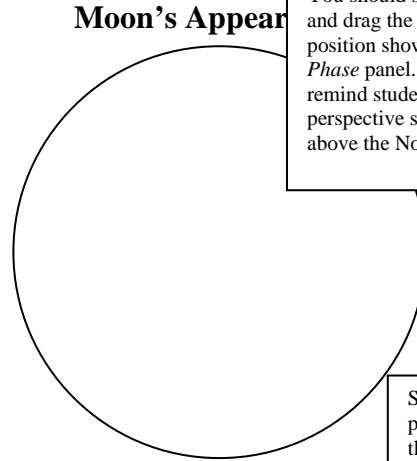
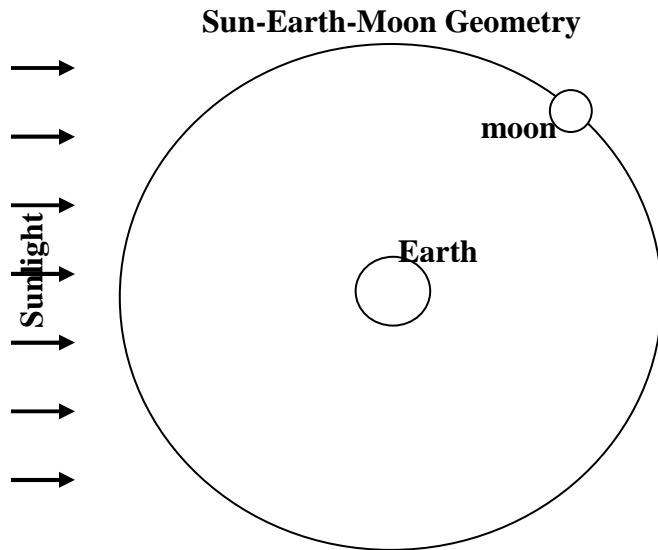


## NAAP InClass Worksheet: Lunar Phases Module (Instructor Version)

1. Sketch the shadows for Sun-Earth-Moon Geometry shown below. Then sketch the appearance of the moon as seen from the earth and notate the name of the phase.

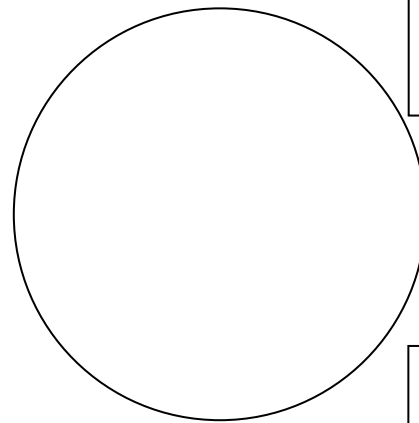
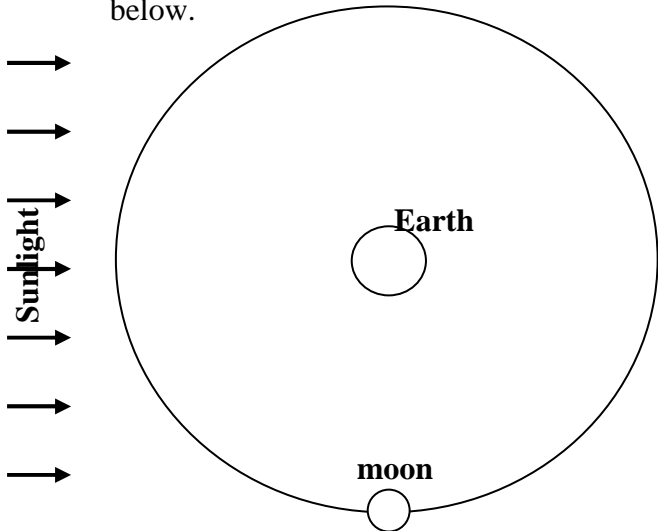


You should start the simulator and drag the moon to the position shown. Hide the *Moon Phase* panel. You may need to remind students that the perspective shown is from above the North Pole.

Show the *Moon Phase* panel to demonstrate the answers.

**Name of Phase:** \_\_\_\_\_

2. Sketch the appearance of the moon and notate the name of the phase for the new geometry below.

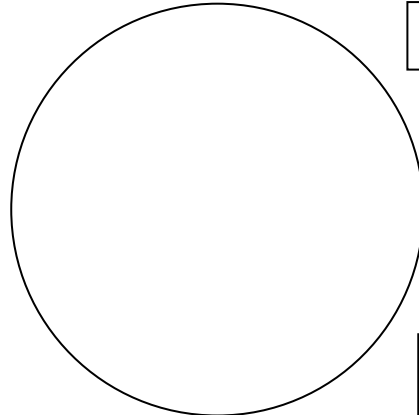
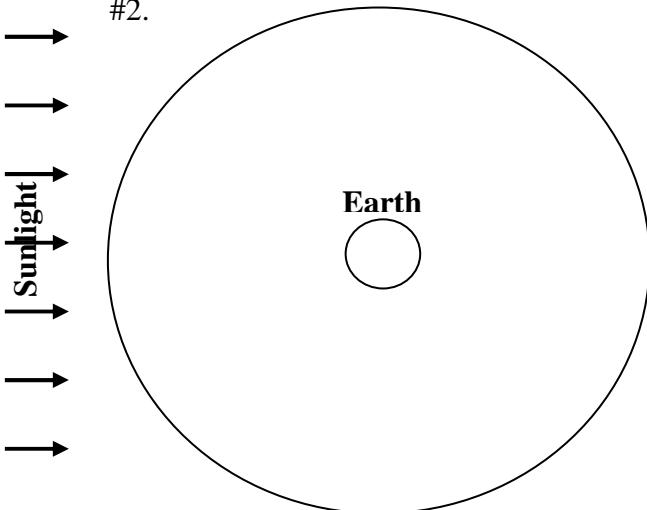


Hide the *Moon Phase* panel and drag the moon to the location shown.

Show the *Moon Phase* panel to illustrate the answers.

**Name of Phase:** \_\_\_\_\_

3. Complete both drawings for the position and appearance of the moon 3 days later than part #2.



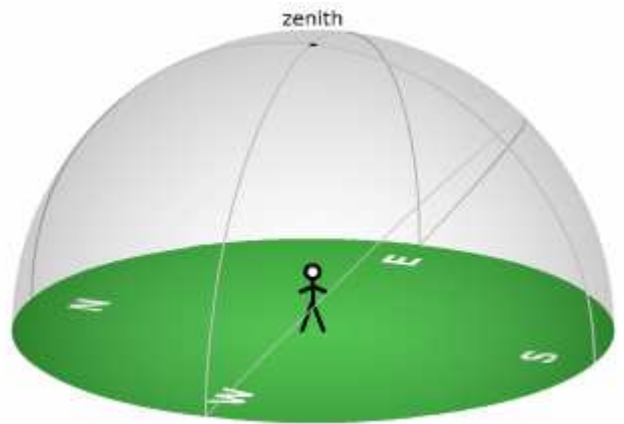
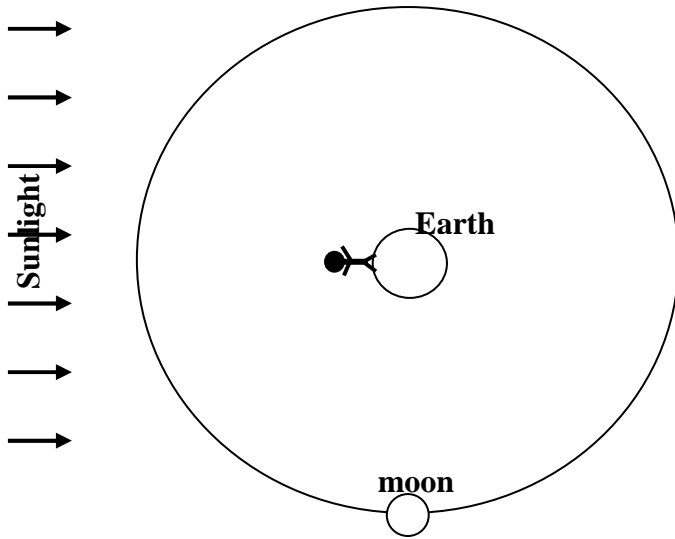
Hide the *Moon Phase* panel.

Show the *Moon Phase* panel and increment by three days using increment animation.

**Name of Phase:** \_\_\_\_\_

4. Draw in the location of the sun and moon in the horizon diagram for the earth-moon geometry shown.

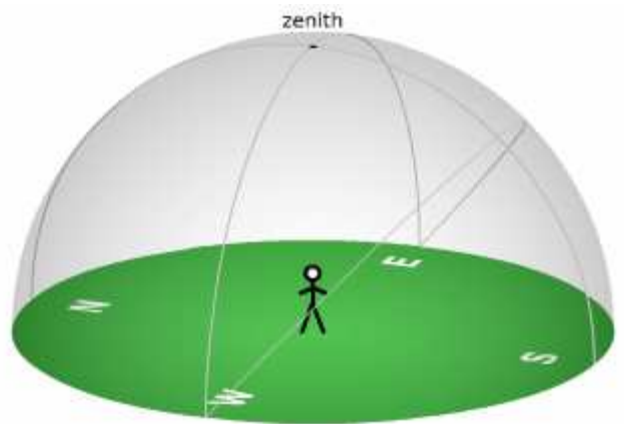
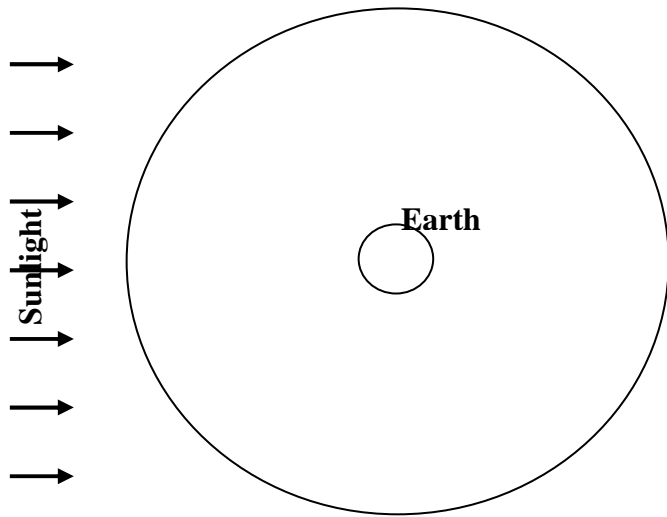
You should drag the moon back to the first quarter position. Hide the *Horizon Diagram* panel.



Show the *Horizon Diagram* panel to illustrate the

5. Draw locations of the moon and observer in the Earth-Moon Geometry diagram and the locations of the sun and moon in the horizon diagram 6 hours later than part #4.

Hide the *Horizon Diagram* panel.



Show the *Horizon Diagram* panel to illustrate the

6. Estimate the angle between the sun and moon in part #5.

No changes are needed to introduce question.

Angle = \_\_\_\_\_

You can check show angle to show the answer. Most students will answer 90°, with “a little bigger than 90° being an optimal answer”.