

PROJECT 5: MOON OBSERVATIONS

You will observe the position and appearance of the moon on four different nights. Pick a location from which to make all of your observations. You may observe the moon from any location and at any time, provided the moon is clearly visible. However, it is important that you orient yourself properly. You must be able to determine which direction is North. So you may wish to observe from a location in which there is a clear landmark that is located due North (or due East, or due South, etc.) from that spot.

Use the moon phase calendar shown below, along with your results from the Observing the Moon lab, to pick nights when the moon will be visible at a convenient time.

Date	Phase
Oct 7, 2012	☾ 3rd Quarter
Oct 14, 2012	● New
Oct 21, 2012	☽ 1st Quarter
Oct 29, 2012	○ Full
Nov 5, 2012	☾ 3rd Quarter
Nov 13, 2012	● New
Nov 20, 2012	☽ 1st Quarter
Nov 27, 2012	○ Full

- For each observation, make a sketch of the moon's appearance on the attached observation sheets. Make this sketch as detailed as possible. The surface of the moon is not uniform in appearance, so don't draw it that way. You don't have to produce a wonderful work of art, but take the time to draw the moon's appearance to the best of your ability. You may wish to use a compass or a circular object to help you draw a nice circle. After that you can fill in the sketch freehand. [1 point per sketch]

Next to each sketch record the following information:

- The date and time of each observation. [2 points per sketch]
- The approximate altitude of the moon at the time of your observation. Recall that altitude is an angular measurement of how far the object is above the horizon. For this measurement (and for some later measurements) you may wish to make your measurements in degrees. The space between three fingers at arm's length is about 4° . Your fist held at arm's length is about 7° across. [1 point per sketch]
- The approximate azimuth of the moon at the time of your observation. To measure the azimuth you start by facing due North (this is why you need to orient yourself) and turn to your right until you are facing the moon. The number of degrees you have turned is the moon's azimuth. Estimate this angle as well as you can. [1 point per sketch]
- The phase of the moon at the time of your observation. [1 point per sketch]
- A description of your location when you made the observation, as well as an explanation of how you oriented yourself to the North. [1 point per sketch]

In addition to making observations of the Moon, we also want to make sense of these observations using our understanding of how the phases of the Moon are related to the Moon's location relative to the Sun in our sky. You may want to consult the solutions for Lab 2: Observing the Moon, or the Phases of the Moon simulation in the Copernican Revolution simulation package. To demonstrate your understanding, do the following:

- For each of your four Moon observations, determine your approximate location on the Earth at the time you made your observation. Mark this location on the diagram provided on the observation sheet and then draw the horizon line for an observer at this time. Note that for the purposes of this question you can pretend that you were on the Equator and that the Moon orbits in the Equatorial plane (you aren't, and it doesn't, but we can still get approximate answers this way). [1 point for marking your location, 1 point for drawing the horizon line for EACH observation]
- For each of your four Moon observations, determine the location of the Moon relative to the Earth and Sun. Draw the Moon at this location in the diagram. [1 point for each observation]
- For each of your four Moon observations, predict where the moon should appear in the sky (eastern or western sky, high or low) based on the diagrams in the previous questions. Evaluate this prediction by comparing it to your actual observation. If it doesn't fit, try to explain why not. [2 points for each observation]

This project is due in class on **Monday 3 December, 2012**.

FIRST MOON OBSERVATION

Sketch

Date:

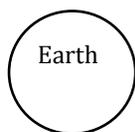
Time:

Altitude:

Azimuth:

Phase:

Location and Orientation:



Sunlight



Prediction:

Evaluation:

SECOND MOON OBSERVATION

Sketch

Date:

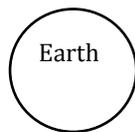
Time:

Altitude:

Azimuth:

Phase:

Location and Orientation:



Sunlight



Prediction:

Evaluation:

THIRD MOON OBSERVATION

Sketch

Date:

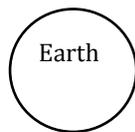
Time:

Altitude:

Azimuth:

Phase:

Location and Orientation:



Sunlight



Prediction:

Evaluation:

FOURTH MOON OBSERVATION

Sketch

Date:

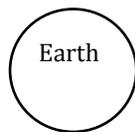
Time:

Altitude:

Azimuth:

Phase:

Location and Orientation:



Sunlight



Prediction:

Evaluation: