

Name: _____

CWID: _____

Section: _____

Introduction

Objectives

The moon changes its position in the sky from day to day as a consequence of its orbital motion around the earth. The goal of this lab is to watch and chart the lunar motion over the course of a week.

Materials

Your eyes and hands, a pencil or pen, and this lab handout. You should also have some way to determine the directions (N/NE/E/SE/S/SW/W/NW) from your location.

To complete this lab you will need to make observations of the moon at the *same time* of day or night *for a total of 7 observing days*. These days should be *consecutive*, but we will allow up to three single-day gaps between observation days. Plan ahead!

We recommend that you find an elevated observing platform (such as the top of the Nutwood parking structure) so you can see as much of the sky as possible. One of the hazards of being an astronomer is cloudy weather. Rest assured that professional astronomers are sympathetic to such problems; do the best you can.

Submission Deadline

You must give your completed lab assignment to your TA before your final lab session. However, to complete this assignment you must start it early. We recommend that your seven-day observing period be roughly centered on:

Morning observation (8AM): Sept 28 or Oct 28

Afternoon observation (4PM): Oct 8 or Nov 7

Evening observation (8PM): Oct 12 or Nov 12

Midnight observation: Oct 18 or Nov 17

For example, you could observe every evening at 8PM from Oct 9 to Oct 15, or every morning except one at 8AM from Sept 27 to Oct 4. Talk to your lab instructor if you are having trouble choosing an observing period.

Observations

On each observing day, complete one row of the Recorded Data table on the next page.

1. Record the date and time of your observation. The date should be in Mo/Da format. The time should be in 12-hour hh:mm with AM/PM specified.
2. Locate the moon in the sky.
3. Make a sketch of the portion of the moon that you can see. If the sky is cloudy and you cannot locate the moon, mark an \times in the box on the table. If the sky is *not* cloudy but you cannot locate the moon in the sky, enter “no moon visible” in the table.
4. Note the phase of the moon.
5. Estimate the altitude of the moon using your hands as an angular measuring device. First record the measurement intervals, and then calculate the total altitude. You can stack your fists alternately one on top of each other to measure longer angular distances. For example, if you stack three fists and then two pinky fingers to measure from the horizon to the moon, you would record “3 fists, 2 pinkies” and calculate the altitude to be $3 \times 10^\circ + 2 \times 1^\circ = 32^\circ$.
6. Record the direction of the moon (N/NE/E/S/SW/W/NW). You can use a compass, a map and visible landmarks, or a smartphone application to determine which direction the moon is in.

Once you have made all your observations, answer the questions in Section 3, which starts on page 4 of this lab handout

Recorded data

Date/Time	Sketch	Phase	Altitude	Direction

Questions

1. What phase was the moon in at the start of the observing period?
2. What phase was the moon in at the end of the observing period?
3. How did the moon's position in the sky change from night to night during your observations?
4. What does the changing position of the moon tell you about the moon's orbit?
5. Would the moon always be visible at your chosen observing time? Explain why or why not.
6. Imagine a day when you observe the moon at a high altitude.
 - a. If you observed the moon again 3 hours later, would it be in the same phase? If not, what phase would it be in? Explain your answer.
 - b. If you observed the moon again 3 hours later, would it be in the same position? If not, how would the position change? Explain your answer.