



ASTRONOMY MERIT BADGE WORK SHEET BYU MERIT BADGE POWWOW

Revision July 2013

Scout's Name _____ Instructor's Name _____

Scout's Address _____ City _____ State _____

Instructions

- 1) The Scout is to review the merit badge book before the first week of PowWow.
- 2) Bring this work sheet, paper, and pencil or pen each week.
- 3) Check the BYU Astronomy Group Website for helpful information to help complete homework assignments. <http://wmo.byu.edu/scouts/>

Requirement Instructions*

- 1) Requirement 1 will be passed off during the two sessions of PowWow.
- 2) Requirement 2 will be passed off during the two sessions of PowWow.
- 3) Requirement 3 will be passed off during the two sessions of PowWow.
- 4) Requirement 4 a, b, and c should be completed as **homework** before or between the two sessions of PowWow. Requirement 4 d will be passed off during the two sessions of PowWow.
- 5) Requirement 5 a, b, and c will be passed off during the two sessions of PowWow. Requirement 5 d should be completed as **homework** before or between the two sessions of PowWow.
- 6) Requirement 6 a and b should be completed as **homework** before or between the two sessions of PowWow. Requirement 6 c and d will be passed off during the two sessions of PowWow.
- 7) Requirement 7 will be passed off during the two sessions of PowWow.
- 8) Requirement 8 will be passed off during the two sessions of PowWow.
- 9) Requirement 9 will be passed off during the two session of PowWow.

*** Due to possible time constraints at the PowWow, certain requirements that were originally planned to be completed in class may need to be completed as homework. Please listen to all instructions in class to be aware of any changes.**

If there is not enough room to write your complete information then you can attach additional pages.

Requirement 1

Initial

Do the following:

a. Explain to your counselor the more likely hazards you may encounter while participating in astronomy activities, and what you should do to anticipate, help prevent, mitigate, and respond to these hazard

b. Explain first aid for injuries or illnesses such as heat and cold reactions, dehydration, bites and stings, and damage to your eyes that could occur during observation.

c. Describe the proper clothing and other precautions for safely making observations at night and in cold weather.

Then explain how to safely observe the Sun, objects near the Sun, and the Moon.

Requirement 2

Initial

Explain what light pollution is and how it and air pollution affect astronomy.

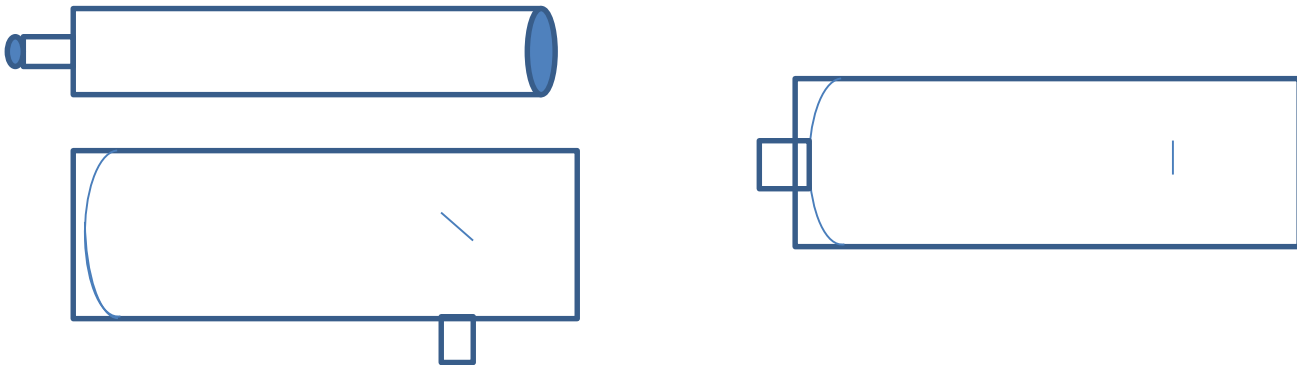
Requirement 3

Initial

With the aid of diagrams (or real telescopes if available), do each of the following:

a. Explain why binoculars and telescopes are important astronomical tools. Demonstrate or explain how these tools are used.

b. Describe the similarities and difference of several types of astronomical telescopes.



c. Explain the purposes of at least three instruments used with astronomical telescopes.

d. Describe the proper care and storage of telescopes and binoculars both at home and in the field.

Requirement 4

Initial

Do the following:

a. Identify in the sky at least 10 constellations, at least four which are in the zodiac. (You can use Apps to help you, but please see the constellation in the real sky). List the constellations and give the date you saw them.

b. Identify at least eight conspicuous stars, five of which are of magnitude 1 or brighter. (Same rules as above)

Name of Star	Magnitude
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

c. Make two sketches of the Big Dipper. In one sketch, show the Big Dipper's orientation in the early evening sky. In another sketch, show its position several hours later. In both sketches, show the North Star and the horizon. Record the date and time each sketch was made.

Date: __/__/__ Time: ____	Date: __/__/__ Time: ____

d. Explain what we see when we look at the Milky Way.

Requirement 5

Initial

Do the following:

a. list the names of the five most visible planets. Explain which ones can appear in phases similar to lunar phases and which ones cannot, and explain why.

Five Most Visible Planets	Phases?	Why?
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

b. using the Internet (with your parent’s permission), books, and other resources, find out when each of the of the five most visible planets that you identified in requirement 5a will be observable in the evening sky during the next 12 months, then compile this information in the form of a chart or table.

Planet Name					
Month					

c. Describe the motion of the planets across the sky.

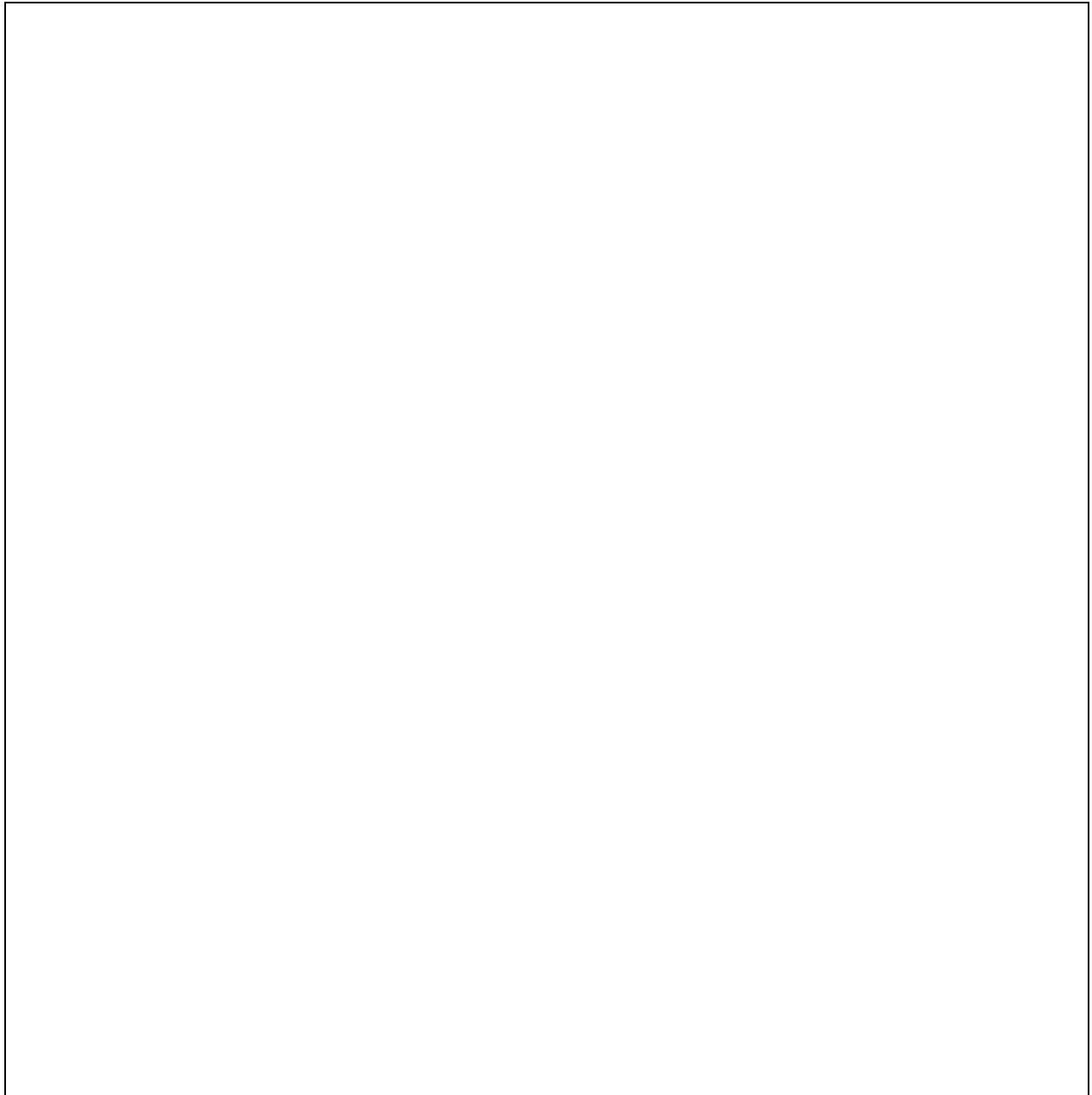
d. Observe a planet and describe what you saw.

Requirement 6

Initial

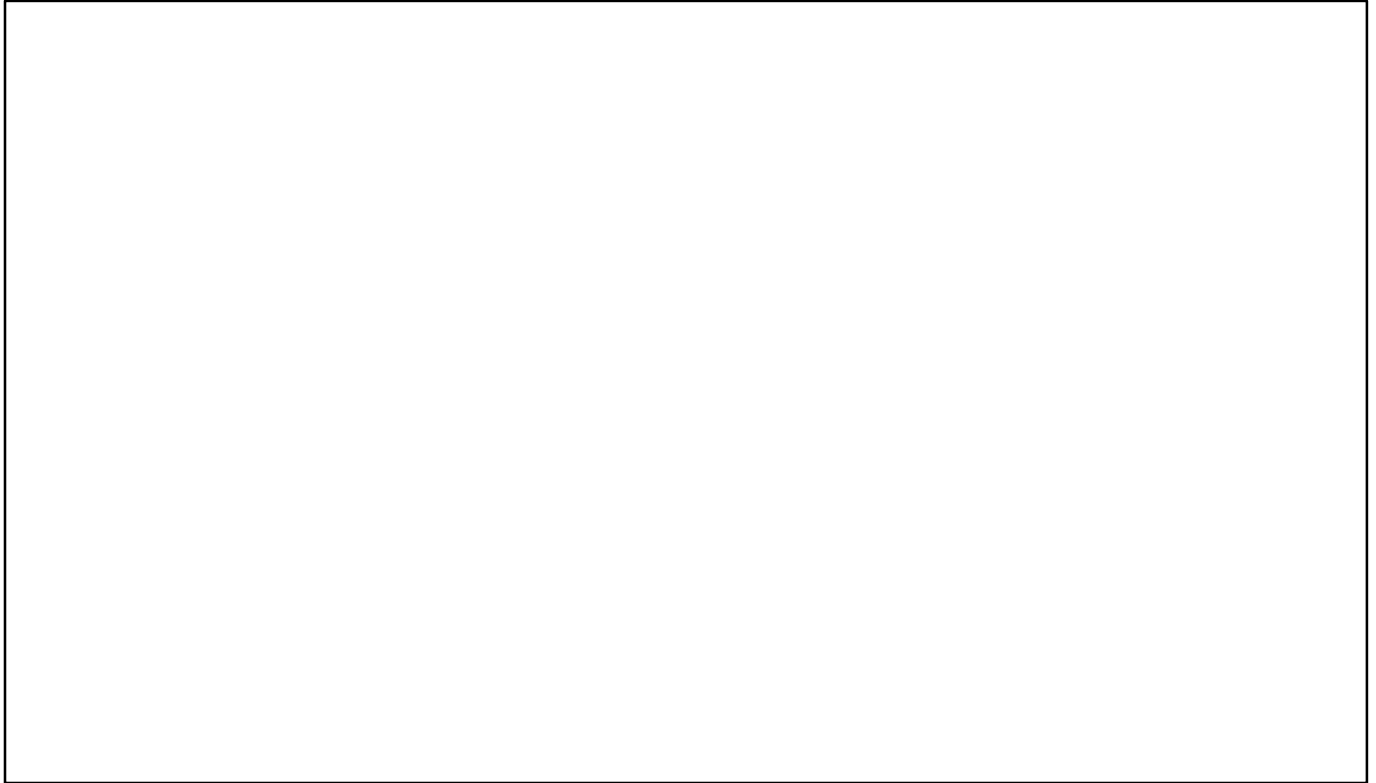
Do the following:

- a. Sketch the face of the moon and indicate at least five seas and five craters. Label these landmarks.



b. Sketch the phase and the daily position of the Moon at the same hour and place, for four days in a row. Include landmarks on the horizon such as hills, trees, and buildings. Explain the changes you observe.

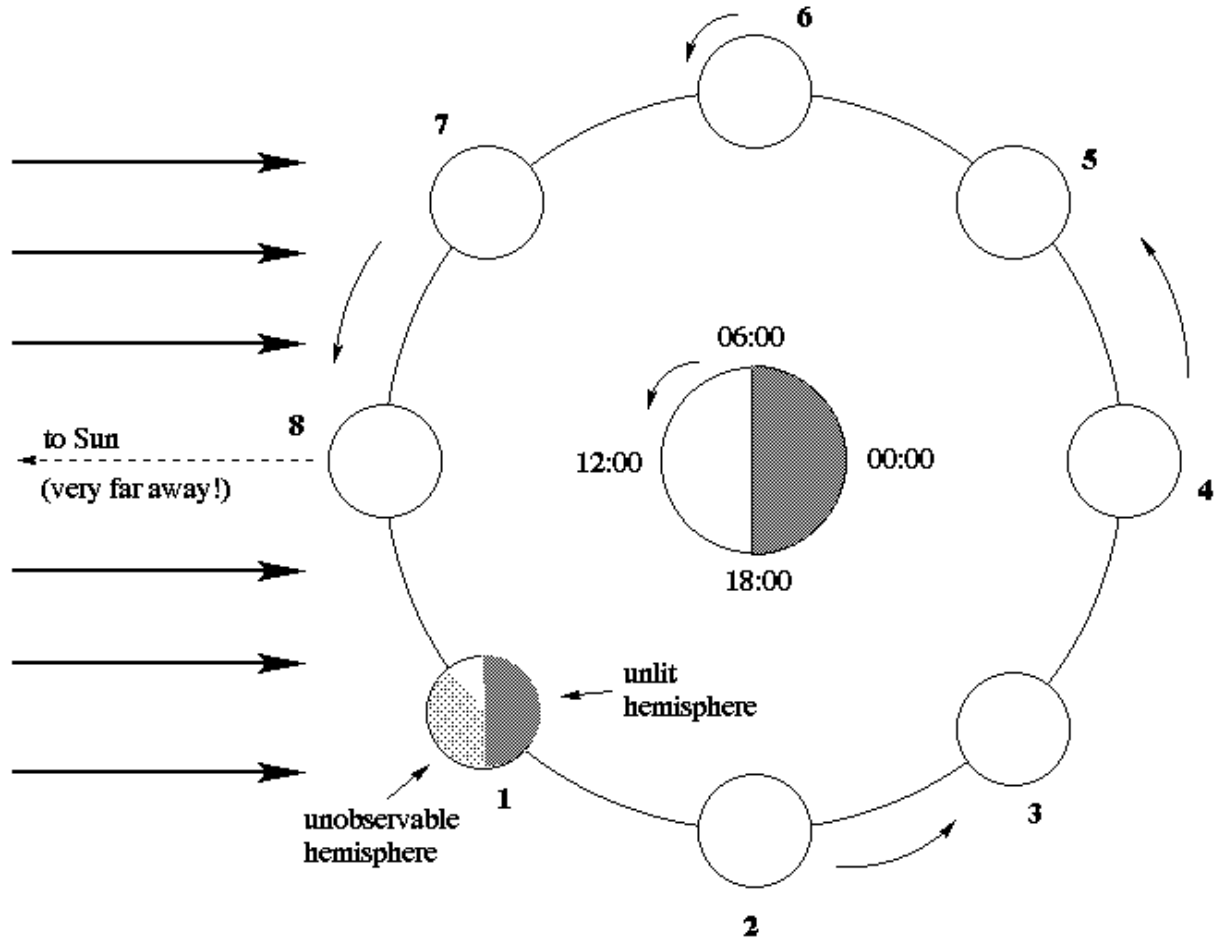
Instructions to help with this homework: Pick a starting night (or day) when the Moon is up at a convenient time. Draw a picture of objects on the horizon like house, trees, mountains, with the Moon on the first night to the right side of the picture. Make sure to draw the phase you see. Then label this with date and time. Now try to see the Moon on the next three nights. Add drawings of the moon phase on those nights (add date and time). If you miss a night try to get the next closest night.



Explain the changes you observe. _____

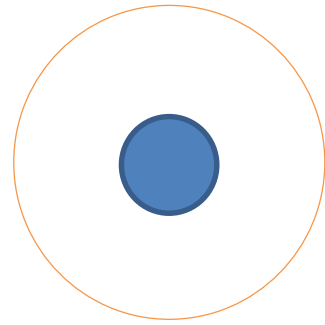
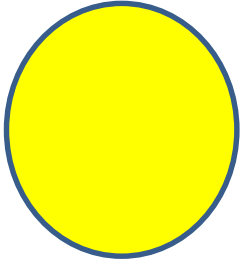
c. List the factors that keep the Moon in orbit around Earth.

d. With the aid of diagrams, explain the relative positions of the Sun, Earth, and the Moon at the times of lunar and solar eclipses, and at the times of new, first-quarter, full, and last-quarter phases of the Moon.

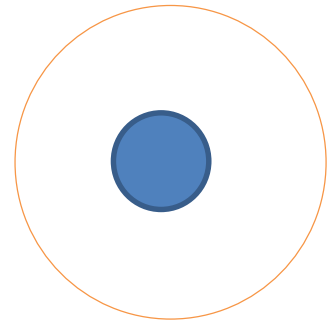
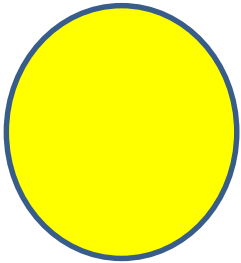


Moon 1: Waxing Crescent	Moon 2:	Moon 3:	Moon 4:
Moon 5:	Moon 6:	Moon 7:	Moon 8:

Lunar Eclipse



Solar Eclipse



Draw the moon in the correct location for each type of eclipse.

Requirement 7

Initial

Do the following:

a. Describe the composition of the Sun, its relationship to other stars, and some effects of its radiation on Earth's weather and communications.

Composition:

Relationship to other stars:

Effects on Earth's weather:

Effects on communications:

b. Define sunspots and describe some of the effects they may have on solar radiation.

Definition:

Effects:

c. Identify at least one red star, one blue star, and one yellow star (other than the Sun).

Red star: _____

Blue star: _____

Yellow star: _____

Explain the meaning of these colors.

