

Astronomy



Pre-requisite Requirements: 4, 5, 6 & 8A or 8B or 8C or 8D or 8E.

Requirement Detail:
See worksheet below:

4. Do the following:*

- a. Identify in the sky at least 10 constellations, at least four of which are in the zodiac.

<input type="checkbox"/> 1.	
<input type="checkbox"/> 2.	
<input type="checkbox"/> 3.	
<input type="checkbox"/> 4.	
<input type="checkbox"/> 5.	
<input type="checkbox"/> 6.	
<input type="checkbox"/> 7.	
<input type="checkbox"/> 8.	
<input type="checkbox"/> 9.	
<input type="checkbox"/> 10.	

- b. Identify in the sky at least eight conspicuous stars, five of which are of magnitude 1 or brighter.

Name of star

Magnitude 1 or brighter?

	Name of star	Magnitude 1 or brighter?
<input type="checkbox"/> 1.		
<input type="checkbox"/> 2.		
<input type="checkbox"/> 3.		
<input type="checkbox"/> 4.		
<input type="checkbox"/> 5.		
<input type="checkbox"/> 6.		
<input type="checkbox"/> 7.		
<input type="checkbox"/> 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: _____

● North Star

West

North

East

Suggested procedure:

Choose a clear night when you will have time and the ability to make observations some hours apart. Looking north, draw the position of the Big Dipper with relation to the North Star. Note the time next to it. Several hours later (six hours are best but at least four hours and preferably more than five hours) draw the position of the big dipper with relation of the North Star and note the time next to it. (Be sure to clearly identify which diagram represents which observation)

* For requirement 4, if instruction is done in a planetarium, Scouts must still identify the required stars and constellations under the natural night sky.

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

5. 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 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.

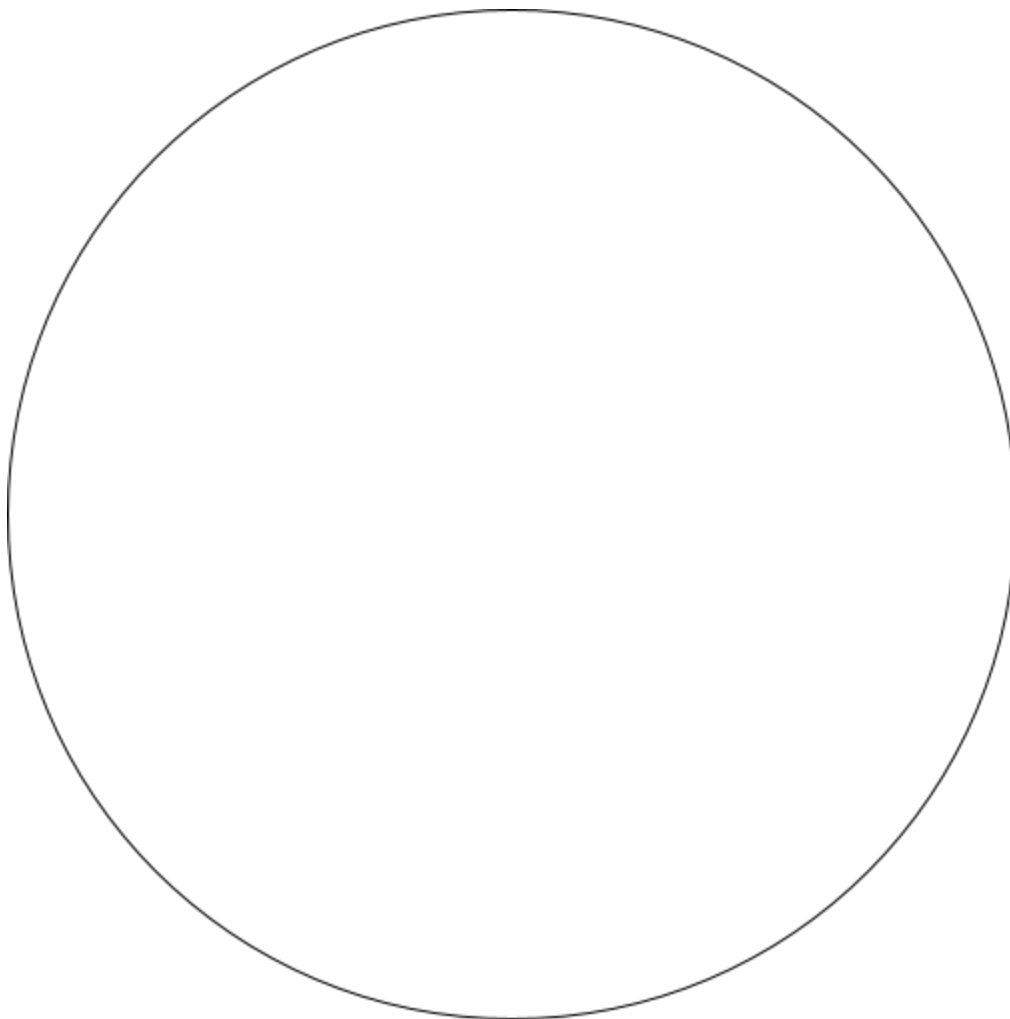
Planet Name					
Month					
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					

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

- d. Observe a planet and describe what you saw.

6. Do the following:

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



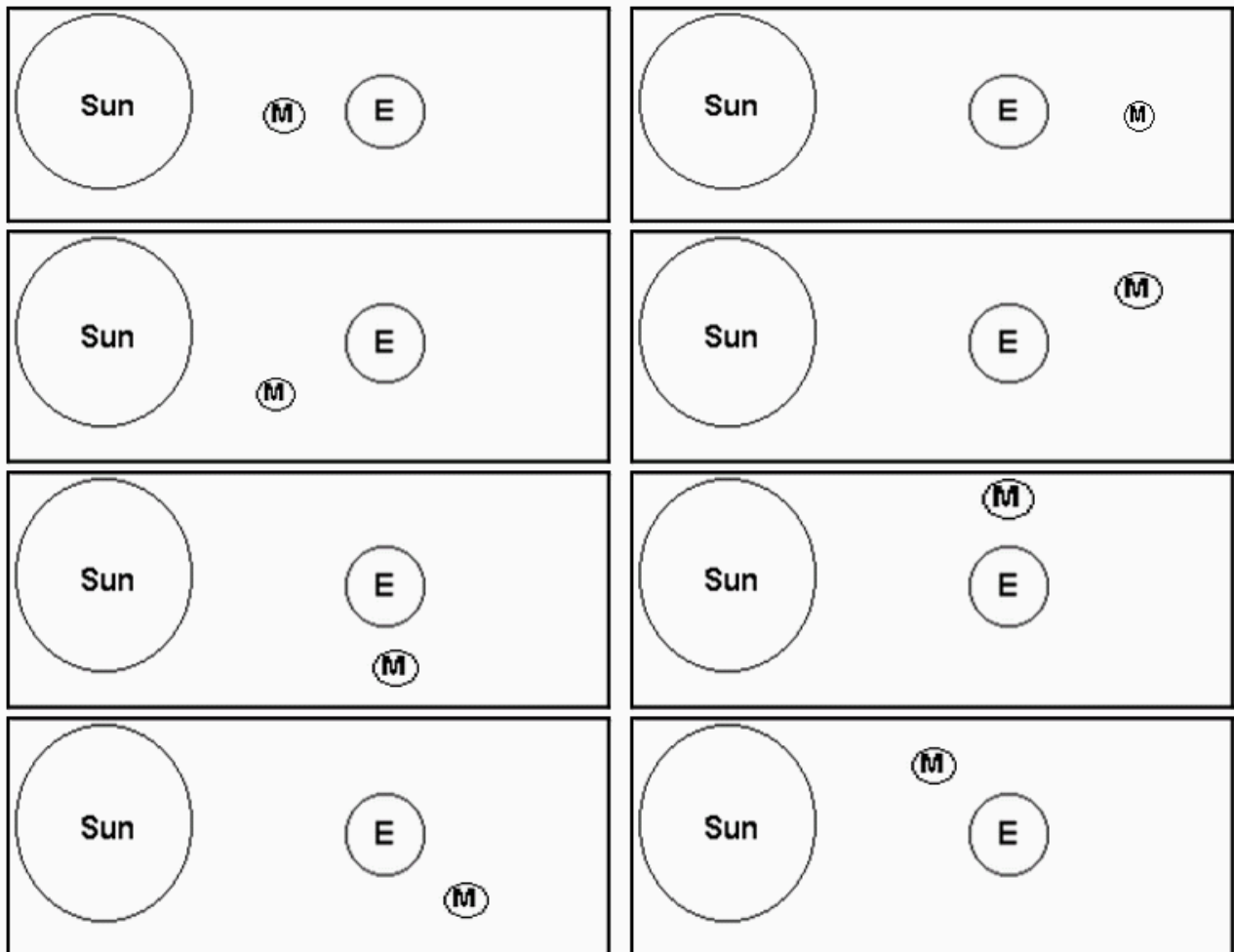
- b. Sketch the phase and position of the Moon, at the same hour and place, for four nights within a one week period. Include landmarks on the horizon such as hills, trees, and buildings.

Date: __/__/__ Time: ____	Date: __/__/__ Time: ____	
Date: __/__/__ Time: ____	Date: __/__/__ Time: ____	
East	South	West
<p><u>Suggested procedure:</u></p> <p><i>First check to see whether it is a morning or evening moon and chose a time to view the moon. Avoid an observation period when there will be a new moon. Choose a time and place you are going to be able to observe the moon each day. On the first day, sketch the relative position of the moon across the southern horizon noting its height and shape (phase). Draw some landmarks on the sketch as points of reference. On the same drawing, repeat this at the same time each day for the next three days, showing the height and shape of the moon for each observation. <u>Note the date and time of your observation next to each sketch of the moon.</u> If the sky is overcast and the moon is not visible, either extend the observations until you can make four of them, and/or using the other observations, estimate where the moon would have been and what shape it would have been on the overcast day(s) and indicate that what is an estimate due to overcast sky.</i></p>		

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.



Editor's Note: These diagrams can be used to show the relative positions of the Sun, Earth, and Moon during the new, first-quarter, full, and last-quarter phases of the Moon as well as during the Waxing Gibbous, "Waning Gibbous", "Waxing Crescent", and "Waning Crescent" phases of the Moon (which is not required for the merit badge). Two of the diagrams can be used to show the positions both for a phase of the Moon and during an eclipse.

With your counselor's approval and guidance, do ONE of the following:

- ☐ a. Visit a planetarium or astronomical observatory. Submit a written report, a scrapbook, or a video presentation afterward to your counselor that includes the following information:

1. Activities occurring there

2. Exhibits and displays you saw

3. Telescopes and instruments being used

4. Celestial objects you observed.

- ☐ b. Plan and participate in a three-hour observation session that includes using binoculars or a telescope. List the celestial objects you want to observe, and find each on a star chart or in a guidebook.

- ☐ Prepare a log or notebook. Discuss with your counselor what you hope to observe prior to your observation session. Review your log or notebook with your counselor afterward.**

** To complete this requirement, you may use the Scout Planning Worksheet at:
http://troopleader.org/wp-content/uploads/2016/03/512-505_16_Wksht_WEB.pdf.

- ☐ c. Plan and host a star party for your Scout troop or other group such as your class at school. Use binoculars or a telescope to show and explain celestial objects to the group.
- ☐ d. Help an astronomy club in your community hold a star party that is open to the public.
- ☐ e. Personally take a series of photographs or digital images of the movement of the Moon, a planet, an asteroid or meteoroid, or a comet. In your visual display, label each image and include the date and time it was taken. Show all positions on a star chart or map. Show your display at school or at a troop meeting. Explain the changes you observed.
