



2024 Edition

# SCOUTMASTER BUCKY

## Astronomy Merit Badge

SCOUTS PARTICIPATING IN A SCOUTMASTER BUCKY MERIT BADGE OPPORTUNITY (ONLINE OR IN PERSON), PLEASE CONSIDER ALSO USING THE ASTRONOMY MERIT BADGE CLASS PREPARATION PAGE FOR CLARIFICATIONS, INSIGHTS, AND EXPECTATIONS.

<https://scoutmasterbucky.com/merit-badges/astronomy/class-prep/>

**REQUIREMENT 1a:** Explain to your counselor the most likely hazards you may encounter while participating in astronomy activities, and what you should do to anticipate, help prevent, mitigate, and respond to these hazards.

HAZARD #1

Description:

Anticipate:

Help Prevent:

Mitigate:

Respond:



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## Astronomy Merit Badge

HAZARD #2

Description:

Anticipate:

Help Prevent:

Mitigate:

Respond:



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## Astronomy Merit Badge

HAZARD #3

Description:

Anticipate:

Help Prevent:

Mitigate:

Respond:



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## Astronomy Merit Badge

HAZARD #4

Description:

Anticipate:

Help Prevent:

Mitigate:

Respond:



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## Astronomy Merit Badge

HAZARD #5

Description:

Anticipate:

Help Prevent:

Mitigate:

Respond:



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HAZARD #6

Description:

Anticipate:

Help Prevent:

Mitigate:

Respond:



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**REQUIREMENT 1b:** 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.

**Heat and Cold Reactions:**

**Dehydration:**

**Bites and Stings:**

**Damage to your eyes:**



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**REQUIREMENT 1c:** Describe the proper clothing and other precautions for safely making observations at night and in cold weather.

at night:

in cold weather:

**REQUIREMENT 1d:** Explain how to safely observe the Sun, objects near the Sun and solar eclipses.

Notes:





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## Astronomy Merit Badge

**REQUIREMENT 2:** Explain what light pollution is

Notes:

**REQUIREMENT 2:** Explain how light pollution and air pollution affect astronomy.

Notes:



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**REQUIREMENT 3a:** With the aid of diagrams (or real telescopes if available) Explain why binoculars and telescopes are important astronomical tools.

**This requirement component must be done with your merit badge counselor.**

Be sure to bring your diagrams and/or telescope and binoculars for your presentation.

**REQUIREMENT 3a:** Demonstrate or explain how these tools are used.

**Notes:**

**REQUIREMENT 3b:** With the aid of diagrams (or real telescopes if available) Describe the similarities and differences of several types of astronomical telescopes, including at least one that observes light beyond the visible part of the spectrum (i.e., radio, X-ray, ultraviolet, or infrared).

**This requirement component must be done with your merit badge counselor.**

Be sure to bring your diagrams and/or telescope for your presentation.

**Notes:**



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## Astronomy Merit Badge

**REQUIREMENT 3c:** With the aid of diagrams (or real telescopes if available) Explain the purposes of at least three instruments used with astronomical telescopes.

**This requirement component must be done with your merit badge counselor.**

Be sure to bring your diagrams and/or telescope for your presentation.

**Notes:**

**REQUIREMENT 3d:** With the aid of diagrams (or real telescopes if available) Describe the proper care and storage of telescopes and binoculars both at home and in the field.

**This requirement component must be done with your merit badge counselor.**

Be sure to bring your diagrams and/or telescope and binoculars for your presentation.

**Notes:**



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**REQUIREMENT 4:** Scouts must identify the required stars and constellations under the natural night sky.

**REQUIREMENT 4a:** Identify in the sky at least 10 constellations, at least four of which are in the zodiac.

This requirement component must be done with your merit badge counselor at night under the natural night sky.

If not indicated in the class summary or class preparation notes, information for completing requirement components in Requirement 4 will be provided during the class.

Notes:

**REQUIREMENT 4b:** Identify in the sky at least eight conspicuous stars, five of which are of magnitude 1 or brighter.

This requirement component must be done with your merit badge counselor at night under the natural night sky.

If not indicated in the class summary or class preparation notes, information for completing requirement components in Requirement 4 will be provided during the class.

Notes:



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**REQUIREMENT 4c:** 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 and Time of this Early Evening Sky Sketch:

Date and Time of this "several Hours Later" Sketch:



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**REQUIREMENT 4d:** Explain what we see when we look at the Milky Way.

Notes:

**REQUIREMENT 5a:** 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.

Most Visible Planet	Name	Phase (Y or N)	Why?
Planet 1			
Planet 2			
Planet 3			
Planet 4			
Planet 5			



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**REQUIREMENT 5b:** Using the internet (with your parent’s permission) 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.

\_\_\_\_\_  
Parent’s Name

\_\_\_\_\_  
Phone

\_\_\_\_\_  
Parent’s Signature

\_\_\_\_\_  
Date

☐

permission

Most Visible Planet	Name	When most observable in the EVENING sky
Planet 1		
Planet 2		
Planet 3		
Planet 4		
Planet 5		

**Notes:**



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**REQUIREMENT 5c:** Describe the motion of the planets across the sky.

Notes:

**REQUIREMENT 5d:** Observe a planet and describe what you saw.

Notes:





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**REQUIREMENT 6a:** Sketch the face of the Moon and indicate at least five seas and five craters. Label these landmarks.





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## Astronomy Merit Badge

**REQUIREMENT 6b:** 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.

NIGHT #1:

Date and Time of Drawing:

NIGHT #2:

Date and Time of Drawing:



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NIGHT #3:

Date and Time of Drawing:

NIGHT #4:

Date and Time of Drawing:



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**REQUIREMENT 6b:** Explain the changes you observe.

Notes:

**REQUIREMENT 6c:** List the factors that keep the Moon in orbit around Earth.

Notes:



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**REQUIREMENT 6d:** 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.

**This requirement component must be done with your merit badge counselor.**

Be sure to bring your diagram to share and review with your merit badge counselor.

**REQUIREMENT 7a:** Describe the composition of the Sun.

Notes:

**REQUIREMENT 7a:** Describe the Sun's relationship to other stars.

Notes:



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**REQUIREMENT 7a:** Describe the effects of the Sun's radiation on Earth's weather and communications

Notes:

**REQUIREMENT 7b:** Define sunspots and describe some of the effects they may have on solar radiation.

Notes:



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**REQUIREMENT 7c:** Identify at least one red star, one blue star, and one yellow star (other than the Sun). Explain the meaning of these colors.

RED STAR:

Name:

Notes:

BLUE STAR:

Name:

Notes:

YELLOW STAR:

Name:

Notes:



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**DO ONE OF THE FOLLOWING (8A, 8B, 8C, 8D, or 8E) FOR REQUIREMENT 8**

**REQUIREMENT 8a:** 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 other instruments being used
4. Celestial objects you observed.

Be sure to bring your report, scrapbook, or video presentation to share with your merit badge counselor.

Place Visited:

Date and time of Visit:

Notes:





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## Astronomy Merit Badge

**REQUIREMENT 8b:** 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.

**YOU MAY WANT TO USE THE [SCOUT PLANNING WORKSHEET](#) TO COMPLETE REQUIREMENT 8B.**

**This requirement must be done both before and after with your counselor. Read the instructions carefully**  
Be sure to bring your prepared logbook to share with your merit badge counselor.

PRIOR TO OBSERVATION SESSION:

Place Observation Session will take place:

Date and time Observation Session will take place:

Notes:



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Don't forget to bring your logbook or notebook to share with your counselor.	
AFTER OBSERVATION SESSION:	
Place Observation Session took place:	
Date and time Observation Session took place:	
Notes:	



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**REQUIREMENT 8c:** 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.

Star Party Location:

Date and Time of Star Party:

Notes:



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**REQUIREMENT 8d:** Help an astronomy club in your community hold a star party that is open to the public.

Star Party Location:

Date and Time of Star Party:

Club Representative's Name:

Club Representative's Name

Phone

Club Representative's Signature

Date

☐

confirmed

Notes:



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**REQUIREMENT 8e:** Personally take a series of photographs or digital images of the movement of the Moon, a planet, an asteroid, meteor, 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.

**This requirement component must be done with your merit badge counselor.**

Be sure to bring your photographs to share and review with your merit badge counselor.

Visual Display Shred with:

Date and Time of Visual Display Sharing:

\_\_\_\_\_  
School / Scout Leader's Name

\_\_\_\_\_  
Phone

\_\_\_\_\_  
School / Scout Leader's Signature

\_\_\_\_\_  
Date

☐

confirmed

Notes:



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**REQUIREMENT 9:** Find out about three career opportunities in astronomy.

Career Opportunity #1:

Career Opportunity #2:

Career Opportunity #3:

**REQUIREMENT 9:** Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor.

Selected Career Opportunity:

Educational Requirements:

Training Requirements:

Experience Requirements:

**REQUIREMENT 9:** Explain why this profession might interest you.

Notes: