



ASTRONOMY MERIT BADGE WORK SHEET (BYU/UVU PowWow)

Scout's Name

Instructor's Name

Scout's Address

City

State

zip

Instructions

- 1) The Scout is to review the merit badge book before the first week of the PowWow.
- 2) Bring this work sheet, paper, and pencil or pen each week.

Requirement Instructions*

- a) The Scout should have completed requirements 1, 2, 4c and d, 5, 6, and 10 before PowWow begins.
- b) During the **first** week of PowWow, the Scout will complete and pass off requirements 3; 7a, c, and d; and 10.
- c) The Scout should complete requirements 2 and 7b for **homework** between the sessions of PowWow.
- d) During the **second** week of PowWow, the Scout will pass off requirements 4a and b, 8, and 9a.

*All requirements may be subject to change by the merit badge counselor based on time constraints at the PowWow session. Please listen to all instructions given by the instructor to be aware of any changes.

Requirement 1

Initial

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

Tell how to safely observe the sun, objects near the sun, and the moon.

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.

Requirement 2

Initial

Explain what light pollution is.

Explain how light pollution and air pollution affect astronomy.

Requirement 3

Initial

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

Explain why binoculars and telescopes are important astronomical tools.

Demonstrate or explain how these tools are used.

Describe the similarities and differences of several types of astronomical telescopes.

Name and explain the purposes of at least three instruments used with astronomical telescopes.

Instrument:

Purposes:

Instrument:

Purposes:

Instrument:

Purposes:

Requirement 4

Initial

A. Identify in the sky at least ten constellations, four of which are Zodiac. List the constellations you identified. Circle the four that are in the Zodiac.

B. Identify in the sky at least eight conspicuous stars, five of which are of magnitude one or brighter. List the stars you identified. Circle the five that are of magnitude one or brighter.

C. Sketch the position of the Big Dipper and its relation to the North Star and the horizon early in the evening. Make a second sketch of the same thing several hours later that same night. Record the date and time of each sketch.

First Sketch Date:

Time:

Second Sketch Date:

Time:

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

Requirement 5

Initial

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.

Find out when each of the five most visible planets will be observable in the evening sky during the next 12 months and indicate the dates/times, etc., when that planet is observable in the chart below. Write the name of the planet in the top row. Update your chart monthly to show whether each planet will be visible during the early morning or in the evening sky.

January

February

March

April

May

June

July

August

September

October

November

December

Requirement 6

Initial

On another piece of paper and at approximately weekly intervals, sketch the position of Venus, Mars, or Jupiter in relation to the stars. Do this for at least four weeks and at the same time of night. On your sketch, record the date and time next to the planet's position.

Explain any changes you noticed in the position of the planet.

Use your sketch to explain how planets move.

Requirement 7

Initial

A. On another piece of paper make a sketch of the face of the moon. Indicate the locations of at least five seas and five craters. Label these landmarks.

During a one-week period sketch the phase and daily position of the Moon at the same hour and place. Include landmarks on the horizon such as hills, trees, and buildings.

Explain the changes you observe.

B. List what factors keep the Moon in orbit around the earth.

C. With the aid of diagrams or drawn on another piece of paper, explain the relative positions of the sun, earth, and the moon at the times of lunar and solar eclipses.

D. With the aid of diagrams or drawn on another piece of paper, explain the relative positions of the sun, earth, and the moon at the times of new, first-quarter, full, and last-quarter phases of the moon.

Requirement 8

Initial

Describe the composition of the sun.

Describe the sun's relationship to other stars.

What effects does the sun's radiation have on the earth's weather?

Define sunspots.

Describe some of the effects sunspots may have on solar radiation.

Identify a red, blue, and yellow star (other than the sun). Explain the meaning of the colors. Record this below.

Red Star:

Name of star (if known) or description of location:

What does the color mean?

Blue Star:

Name of star (if known) or description of location:
What does the color mean?

Yellow Star:

Name of star (if known) or description of location:
What does the color mean?

Requirement 9

Initial

For this requirement you have been given five options. With your counselor’s approval and guidance, select and complete ONE of them.

Option 1:

Visit a planetarium or astronomical observatory. Submit a written report, a scrapbook, or a video presentation to your counselor that includes information on the activities occurring there, on the exhibits and displays you saw, and of telescopes, instruments, and other celestial objects you observed. Use the area below to take notes on your visit. Attach a copy of your report to this work sheet.

What activities did you see occurring at the planetarium?

What exhibits and displays did you see?

What telescopes and instruments were being used?

What other astronomical objects did you observe?

Other Notes:

Option 2:

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 an observing log or notebook. Show your plan, charts, and log or notebook to your counselor before making your observations. Use your log or notebook to take notes during your observation period.

Use all this information to create a short report for your counselor on what you observed. Attach a copy of your report to this work sheet.

Date of observation:

Time Start:

Time End:

Option 3:

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.

Date of Observation:

Group and people involved:

Notes:

Option 4:

Help an astronomy club in your community hold a star party that is open to the public. Use the space below to take notes on the planning process and how the event turned out.

Date of Observation:

Group and people involved:

Notes:

Option 5:

Personally take a series of photographs or digital images of the movement of the moon, a planet, an asteroid or meteoroid, or a comet.

Create a visual display of your photos, label each image, and include the date and time it was taken. Also record the label, date, and time of each image below. Use the back of this page if you need more space.

Label of image:

Date image was taken:

Time:

Label of image:

Date image was taken:

Time:

Label of image:

Date image was taken:

Time:

Label of image:

Date image was taken:

Time:

Label of image:

Date image was taken:

Time:

Label of image:

Date image was taken:

Time:

In your display, show all the positions on a star chart or map. Show your display at school or at a troop meeting.

Explain the changes you observed in your photographs or images.

Requirement 10

Initial

Use the spaces below to list at least three different career opportunities in astronomy.

Pick the one in which you are most interested. Explain the preparation needed for such a career.

List some of the courses most useful in beginning such a preparation.

Merit badge work sheets will not be accepted at the Council Office in place of the official Merit Badge Application Card. Those who do not complete all the requirements should take their partially completed merit badge work sheet and their official application card to their local merit badge counselors for completion.