Finding Objects in the Night Sky

SKILLS MENU

Questioning	Performing
Hypothesizing	Observing
Predicting	Analyzing
Planning	Evaluating
Controlling Variables	Communicating

In Section 8.1, you sketched the positions of objects in the night sky using a horizon diagram. In Section 8.8, you used a star map to predict the motions of the stars throughout the night and as the year progresses. In Section 8.9, you practiced estimating the positions of objects in the night sky using altitude and azimuth. In this activity, you will combine these skills to sketch, describe, and identify objects in the night sky from your location in Ontario.

Purpose

To sketch objects in the night sky, describe their position using altitude and azimuth, identify them, and predict their motions using a star map.

Testable Question

How can the positions of celestial objects be predicted?

Hypothesis/Prediction

In this investigation, you will make your predictions in Part B.

Equipment and Materials

- compass
- flashlight
- paper
- pencil
- ruler
- star map

Procedure

SKILLS HANDBOOK 3.B.5., 3.B.6.

Part A: Sketch and Describe

1. Your teacher will choose a date and time for you and your classmates to go outside and observe the night sky. Find an open area where you can see as much of the horizon as possible.
2. Using your compass, find north.
3. Turn around 180°, so that you are facing south.
4. On a piece of paper, sketch trees or buildings that are along the southern horizon. You will use these as landmarks to draw the objects in the night sky.
5. Draw the brightest objects you see in the night sky as they appear against the horizon. Make your drawing as accurate as possible.
6. Determine the altitude and azimuth of the celestial objects. Write down the altitude and azimuth measurements next to the objects on your diagram.
7. Be sure to identify the location, date, and time on your horizon diagram.

Part B: Identify and Predict

SKILLS HANDBOOK 3.B.3

8. Set the star map you created in Section 8.8 to the date and time of your observation.
9. Using the star map, identify some of the stars or constellations you drew on your horizon diagram.
10. Using the star map, predict how your sketch would change if you observed from the same location two hours later.
11. Go to the same location two hours later than you did in Part A and repeat your observations. Did your observations support your predictions?
12. Continue observing from the same spot for a few nights in a row *at the same time*. Sketch and identify common celestial objects, such as the Moon; the planets Jupiter, Mars, and Venus; and the stars Polaris, Sirius, and Vega if these are visible. Sketch a new horizon diagram each night.

13. In your notebook, create a table similar to Table 1 and record your data.

Table 1 Altitude and Azimuth of Night Sky Objects

Date	Celestial object	Altitude	Azimuth
	Moon		
	Venus		
	Sirius		

14. Compare your horizon diagrams with those of other members of your class.

Analyze and Evaluate

SKILLS HANDBOOK 3.B.7., 3.B.8.

(a) What was the brightest object you could identify? T/I

(b) What was the dimmest object you could identify? T/I

(c) How does the azimuth of the Moon change from night to night? T/I

(d) How does the azimuth of the planets change from night to night? T/I

(e) How does the azimuth of the stars change from night to night? T/I

(f) How did the positions of the celestial objects in your horizon diagrams compare with those of other members of your class? T/I

(g) Answer the Testable Question. T/I

Apply and Extend

SKILLS HANDBOOK 3.B.6., 3.B.8., 3.B.9.

(h) The horizon diagram in Figure 1 shows the Big Dipper and the Little Dipper as seen in the northern part of the sky in late autumn. Draw another horizon diagram showing both constellations as they would appear several hours later. T/I

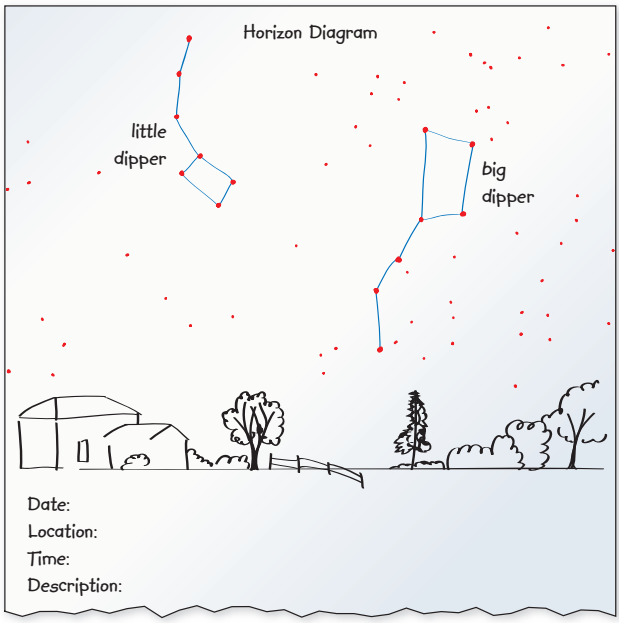

Figure 1 Ursa Major and Ursa Minor are commonly known as the "Big Dipper" and "Little Dipper," respectively.

(i) Identify a planet in the night sky and draw a horizon diagram for that planet. Make sure to note the date and time of your observation on your horizon diagram. Observe the same planet on the same (or close to the same) day of the month for 4 to 5 months, drawing a labelled diagram each time. After the 4 to 5 month period, compare your horizon diagrams with each other. How has the location of the planet changed over time? How does this change compare to the changes in the position of the celestial objects in (d)? T/I

UNIT TASK Bookmark

How can you apply what you learned about horizon diagrams and altitude and azimuth in this section to the Unit Task described on page 446?