

ACTIVITY 7

INTRODUCTION TO THE STAR FINDER

Grades :
**6 and
higher**

Level of preparation:
intermediate

Student groupings:
**individual or
small groups**

Length:
60 minutes

Location of activity:
at school

BRIEF DESCRIPTION

In this activity, students cut and assemble their own star finder and learn how to use it. An activity sheet is then used to introduce them to the main stars and constellations.

LEARNING GOALS

- Use the star finder, an observational tool.
- Recognize the main stars and constellations.

MATERIALS

- Star finders printed on cardstock paper (2 sheets per student)
- Scissors
- Activity sheet

INTRODUCTION

A star finder is a chart that allows us to identify the main stars and constellations visible at a specific time. It is a basic tool for all those who are becoming interested in astronomy and observing the night sky. This cardboard version allows a first introduction. If students are interested, they can buy a plastic version (\$10-20) available in most bookstores.

PREPARATION

Before the activity, print the star finders on cardstock paper, 8 ½ X 11 in. Each student should have two sheets: the sky map and the support with the times. If you do not have cardstock paper, you can print on regular paper and ask students to glue it on thin cardboard, such as file folders (used ones if possible, to reduce the use of new material).

Print the activity sheet so that each student has a copy.

METHOD

Distribute the sheets to each student and ask them to cut out the pieces following the instructions on the star finder.

Then show how to use the star finder:

- Insert the chart in the support to see the constellations in the oval hole.
- Align the time on the support with the date on the wheel at which you want to observe the sky.
- The constellations visible in the hole represent the sky at this time. The edges of the oval represent the horizon, while its centre represents the point directly overhead, called the zenith.
- While looking at the actual sky, turn the star finder so that the direction at the bottom of the star finder coincides with the direction in which you're looking.

You can **show the following video in class to demonstrate how to use the star finder:** <http://youtu.be/BgqCmDIT9c>

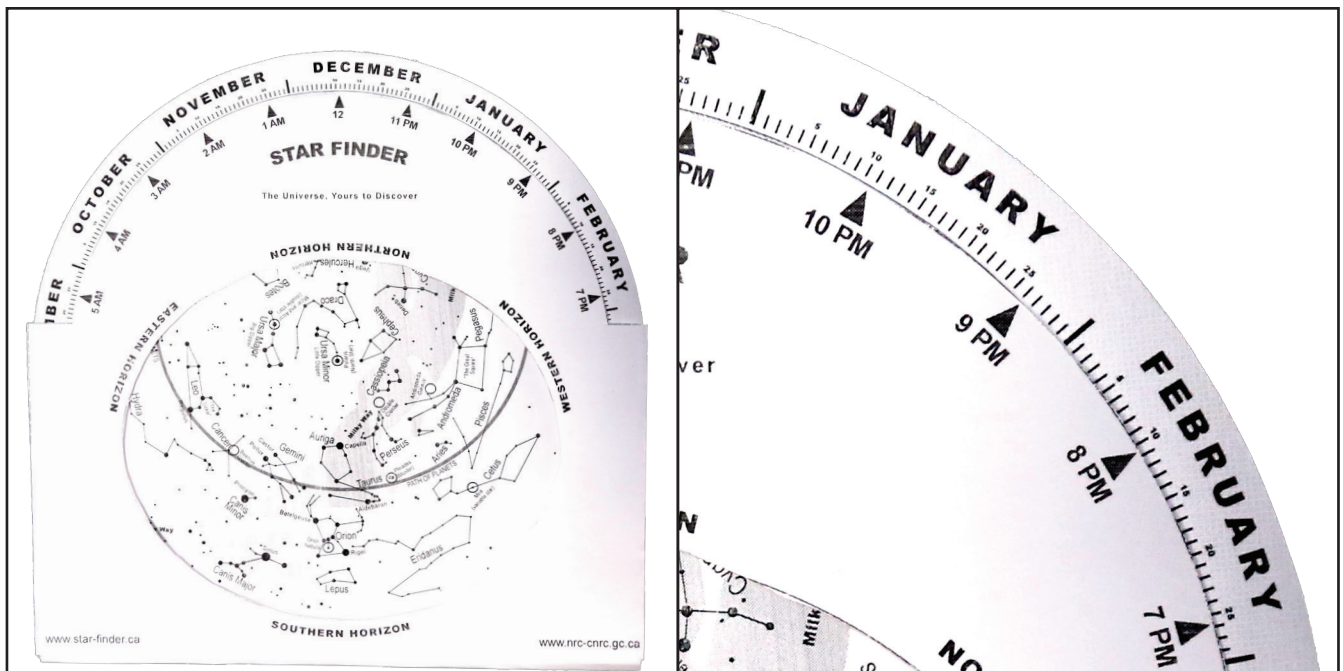


Figure 10. Star finder set to show the sky on February 10 at 8pm .

ADDITIONAL INFORMATION

The star finder presented here is associated with the website www.star-finder.ca.

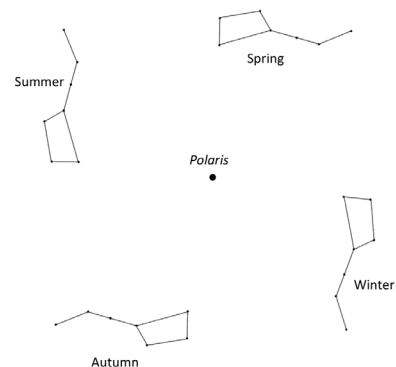
There you can get more information about using the star finder and its characteristics. Here are some interesting facts about the star finder which are discussed in more detail on the website:

- The small circles represent interesting celestial objects visible to the naked eye or with a small instrument (binoculars or telescope). These objects can be interesting stars, star clusters, galaxies or nebulae. You can find more information about these objects on the website www.star-finder.ca.
- The pale grey band across the sky is the Milky Way, our galaxy. In this region of the sky, we find many more stars, which creates a whitish band. However, one must be away from light pollution to see it clearly.
- The dark circle labeled "Path of planets" shows the range of positions at which planets can be visible. This is called the ecliptic. Since the planets are always moving in the Solar system, they are not represented on the star finder. If you see a bright, unmoving star-like object in the sky which is not represented on the star finder, but is close to this band, it is probably a planet.

Note that **the star finder does not account for daylight saving time**. When DST is in effect, subtract an hour from the time indicated on your watch. For example, if you want to observe the sky at 9pm daylight saving time, set the star finder for 8pm.

STUDENTS' WORKSHEET ANSWER KEY

1. **Name three constellations visible in the south tonight.** To find the constellations visible in the south, simply align the date and time on the star finder and look at the major constellations above the southern horizon. We can look between the southeast and southwest. Be careful not to go beyond the centre of the oval, which is the point directly overhead.
2. **Name three bright stars visible in the sky tonight.** The brightest stars are represented by black dots. The bigger the dot, the brighter the star. Here are a few bright stars identified on the star finder: Sirius, Vega, Altair, Deneb, Aldebaran, Rigel, Betelgeuse, Antares, Regulus, Arcturus, and Polaris.
3. The Big Dipper is visible every night of the year, but its orientation and position change according to the season. Here is the approximate position of the Big Dipper in the evening depending on the season, as seen in this image:



4. **Name an interesting celestial object (in a small circle) visible tonight.** Several objects are visible to the eye or with a small instrument such as binoculars or a small telescope. These objects are circled on the star finder. Here are those indicated on the star finder:
 - Beehive Cluster, in the constellation Cancer
 - Orion Nebula, in the constellation Orion
 - Pleiades cluster, in the constellation Taurus
 - Mira, a variable star in the constellation Cetus
 - Double Cluster, between the constellations Perseus and Cassiopeia
 - Andromeda Galaxy, in the constellation Andromeda
 - Coathanger Cluster, between the constellations Cygnus and Aquila
 - Hercules Cluster, in the constellation Hercules
 - Polaris, in the constellation Ursa Minor
 - Mizar and Alcor in constellation Ursa Major

5. **Draw the constellation Cassiopeia. In what region of the sky is it visible tonight?** The constellation Cassiopeia looks like a W. Depending on the time of the year, it can also look like an M or be on its side. It's visible in the northern part of the sky, but its exact position varies from northeast to northwest or almost at the zenith.

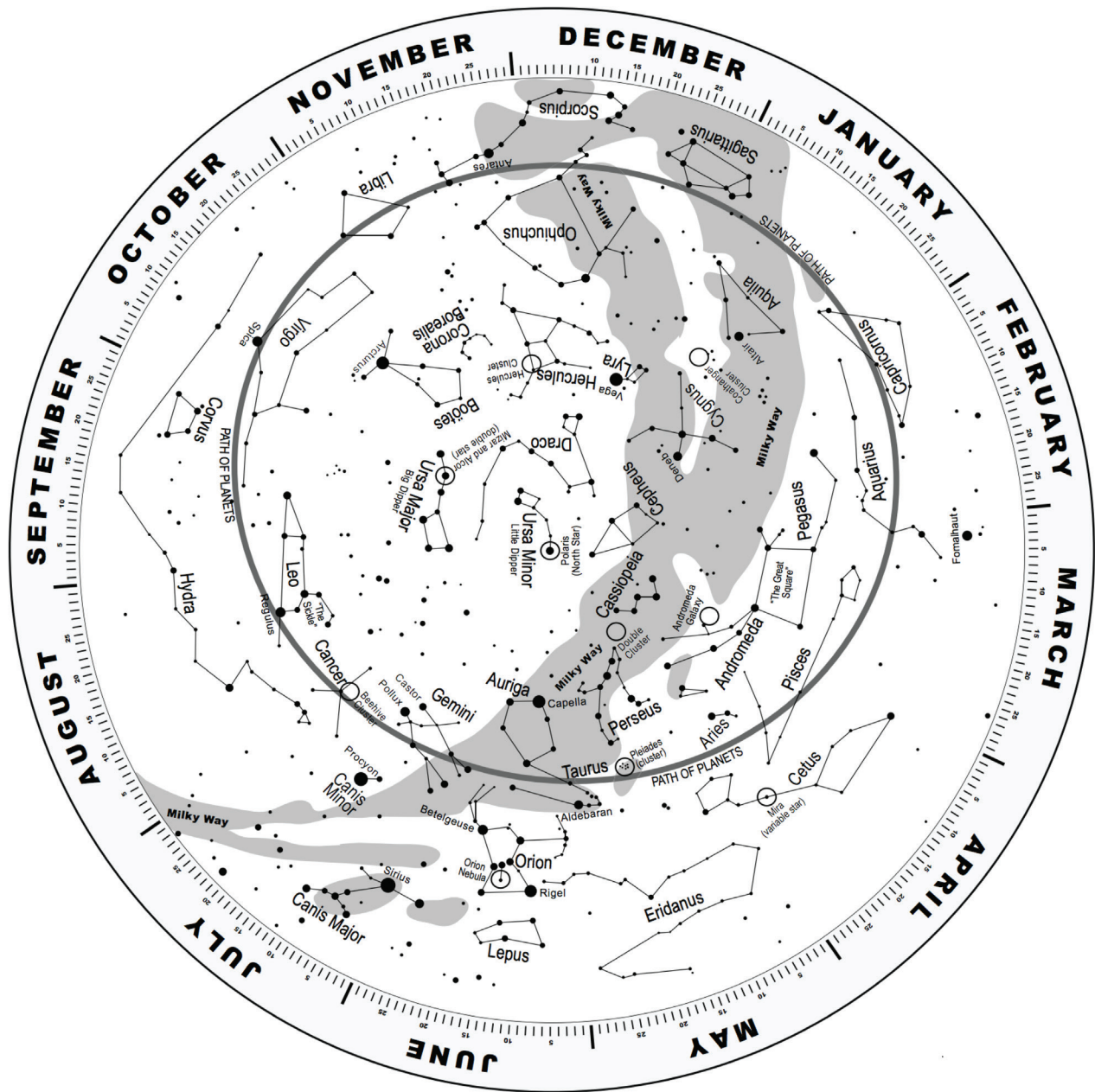
6. **Name three constellations which are in the band of the Milky Way.** These constellations are found along the grey band representing the Milky Way: Canis Minor, Canis Major, Gemini, Orion (in part), Auriga, Taurus, Perseus, Cassiopeia, Andromeda (in part), Cepheus, Cygnus, Aquila, Lyra, Ophiuchus, Sagittarius, Scorpius.

7. **Imagine we look at the sky on March 20 at 8pm. We can see the stars in the same positions at other combinations of dates and times. At what time of the night do we need to look to see the same sky as the one on March 20 at 8pm if today's date is a) January 20? b) November 20?** If you configure the star finder to show the sky on March 20 at 8pm, you may notice that other date/time combinations will show the same sky. You simply need to read off the time aligned with January 20 and you can find 12am. On November 20, you would need to look around 4am to see the same stars and constellations.

REFERENCES

This activity is based on the star finder developed by the Royal Astronomical Society of Canada with the accompanying site www.star-finder.ca.

STAR FINDER - PART 1



Instructions:

- When printing, set "Page Scaling" to "None" in Adobe Acrobat.
- Carefully cut around the outside of the circle.
- The round star map fits inside the holder after the flaps are folded back.

Copyright 2008 RASC

Non-commercial reproduction for personal and educational use is permitted.

STAR FINDER

The Universe, Yours to Discover

NORTHERN HORIZON

EASTERN HORIZON


SOUTHERN HORIZON

WESTERN HORIZON

12
11 PM
10 PM
9 PM
8 PM
7 PM
6 PM
5 PM
4 AM
3 AM
2 AM
1 AM

Fold line

A Project of
The Royal
Astronomical
Society of Canada



Instructions (1)
Do not cut along dashed lines. These are used as guides to fold the tabs.

It is a good idea to tape the flaps.

Put the round star map into the holder.

Go to
www.starfinder.ca
for information about astronomy and the Star Finder.


www.nrc-cnrc.gc.ca

Instructions (3)

The oval area shows the entire visible sky. Overhead stars are in the centre of the oval. Stars near the horizon are close to the edge. To identify stars, hold the Star Finder in front of you so the label for the horizon you are facing is at the bottom. If you are not sure of the direction, try to find the Big Dipper which is usually North.

Fold line

Initial design courtesy of
National Research Council Canada



Instructions (2)
Turn the round star map so the date matches the time you are observing.

The time shown is standard (winter) time. For daylight savings time (summer), subtract one hour, so at 9PM turn the star map to 8PM.

The Star Finder is designed for latitude 45°. If you live much further north, the patterns in the sky are similar, but fewer southern stars are visible.

www.star-finder.ca

Fold line

ACTIVITY WITH THE STAR FINDER

Align the star finder to see the sky tonight at 8pm and answer the following questions.

1. Name three constellations visible in the south at 8pm tonight.

2. Name three bright stars visible in the sky at 8pm tonight.

3. The Big Dipper is the main part of the constellation Ursa Major. Where is this constellation tonight? If you look in this direction, draw the Big Dipper as you would see it in the sky. Now, align the star finder to show the sky 6 months from now. Where is the Big Dipper now? Draw it and compare your two drawings.

4. Name an interesting celestial object (in a small circle) visible tonight?

5. Draw the constellation Cassiopeia. In what region of the sky is it visible tonight?

6. Name three constellations which are in the band of the Milky Way.

7. At what time of the night do we need to look to see the same sky as the one on March 20 at 8pm if today's date is a) January 20? b) November 20?
