

**RECOMMENDED  
FOR GRADES 2-7**



**CONSTRUCTION: 30 MINUTES,  
EXTRA TIME TO PRACTICE USE**

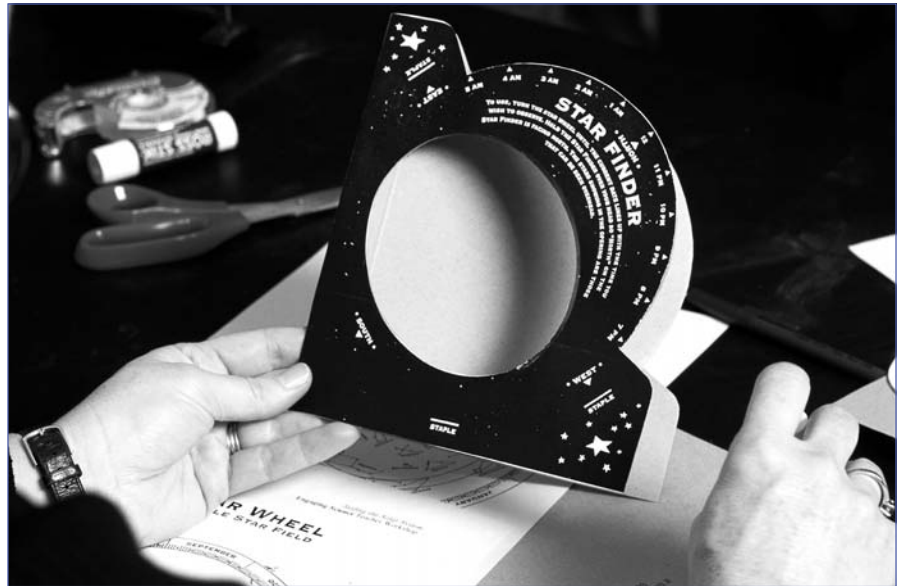


## MAKE A STAR FINDER

*What is inconceivable about the night sky is that it should be at all conceivable.*

**Albert Einstein (1879-1955), German-Swiss-American theoretical physicist**

The difficult task of determining the constellations in the night sky when they have the mysterious habit of continually moving (actually it is the Earth's spin which creates the movement) is made easier by the construction of a "movable map" which students can set to the exact date and time of the night they are sky gazing. It's a wonderful tool for introducing astronomy to students!



### WHAT WILL HAPPEN

Students will construct a "movable map" to help determine what is observable in the night sky on a particular night.

### WHAT YOU NEED (for each star finder)

- pattern for star finder holder and two constellation wheels
- scissors
- 1½ file folders
- glue
- stapler

### HINT

It is difficult to view the star finder with a bright white flashlight and keep your night vision! Cover the flashlight with red cellophane or paint the end of the flashlight with red nail polish.

## WHAT TO DO

1. Glue the holder pattern onto the front of the file folder, with the “east-south” edge of the holder along the fold.
2. Cut out the star finder as indicated on the pattern. Cut out the centre oval through the front layer only. Then staple the front and back together by placing staples exactly on the staple lines shown on the front of the star finder holder.
3. Glue one constellation wheel onto the half file folder, cut it out, and then cut out and glue the other wheel onto the opposite side.
4. Insert the constellation wheel between the pages of the holder so that the simple star field shows through the opening. Test the wheel by turning it and ensuring that it moves freely in the holder. Also, check to see if the black line under the dates on the star wheel lines up approximately with the edge of the star finder cover showing the time of day.



## HOW TO USE

1. Practice in the classroom. Align the current date on the wheel with the time indicator on the holder.
2. The simple star wheel is for beginner astronomers and also represents the night sky as seen from the city (light pollution causes only the brightest stars to be visible). The complex wheel is designed for those with some stargazing experience and represents the night sky as seen in the country where there are not as many bright lights.
3. Hold the star finder above your head so that the arrow pointing from the north designation is pointing towards the North Star and the map is facing you. The stars showing in the opening are those that can be seen overhead at the time and date set on the star finder. The edge of the oval represents the horizon and the stars near the edge will be low on the horizon.

### CROSS-CURRICULAR CONNECTIONS

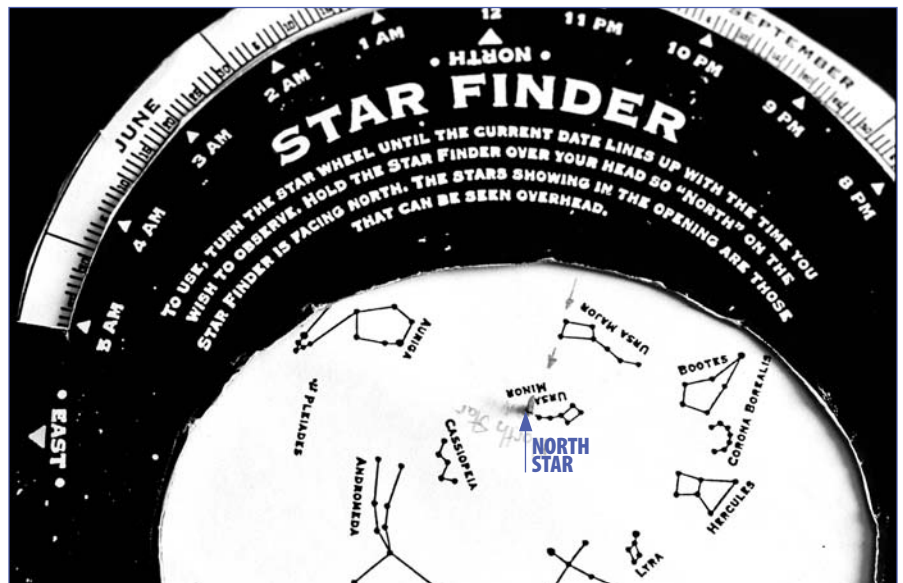
Research who named the constellations and the significance of the names. Investigate the myths and legends that people through the ages have told about the night sky. One book of such stories is *Keepers of the Night, Native American Stories and Nocturnal Activities for Children* by Michael J. Caduto and Joseph Bruchac (Saskatoon: Fifth House, 1994).

## HOW TO FIND THE NORTH STAR

Ask students to find the North Star on the star finder. First, look for the Big Dipper (Ursa Major on the star wheel). Find the two end stars in the bowl of the dipper and follow them upwards to the Little Dipper (Ursa Minor on the star wheel). The last star in the handle of the Little Dipper is called Polaris. This is the North Star and when facing it you are facing north.

Since the North Star is directly above the North Pole, the Earth's rotation does not affect it and it remains in the same place in the night sky.

When you spin the wheel in the Star Finder, you also find all the stars moving around the North Star, while it stays in the same place. You can prove this by placing a pin through it and spinning the wheel! (See photo below.)



Try using a pair of binoculars to observe objects in the sky. They'll provide a great view, and are easier to use and cheaper than a telescope.

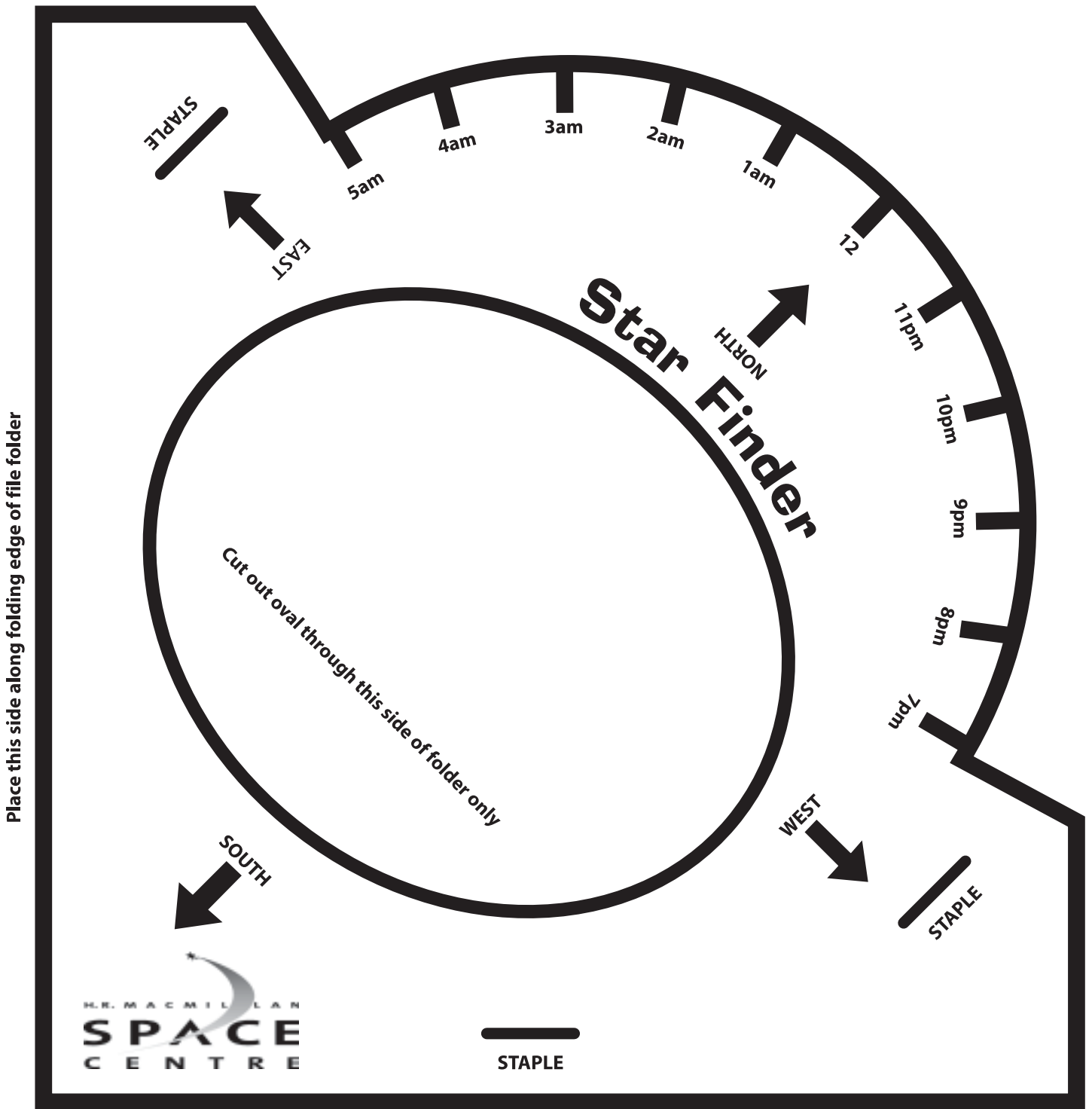
## WHAT TO DO NEXT

- Ask students which constellations would be visible if they were to observe at midnight tonight.
- Using a star map which labels individual star names, pick a star like Vega or Arcturus, have students label it on their Star Finders, and then ask students what month would be the best for viewing it.
- On the complex star wheel there is an off-centred circle. This is the area in which the planets travel. Because the planets move it is impossible to plot them on a star finder. To find out the positions of the planets on a given date, either contact the Planetarium or consult an astronomy magazine or observer's handbook.
- Have students record which stars they have found on a classroom chart to map progress.
- Have students (with the help of their parents!) take a picture of a constellation at night with a four or five minute time lapse. The picture will show the movement of those stars during that time.



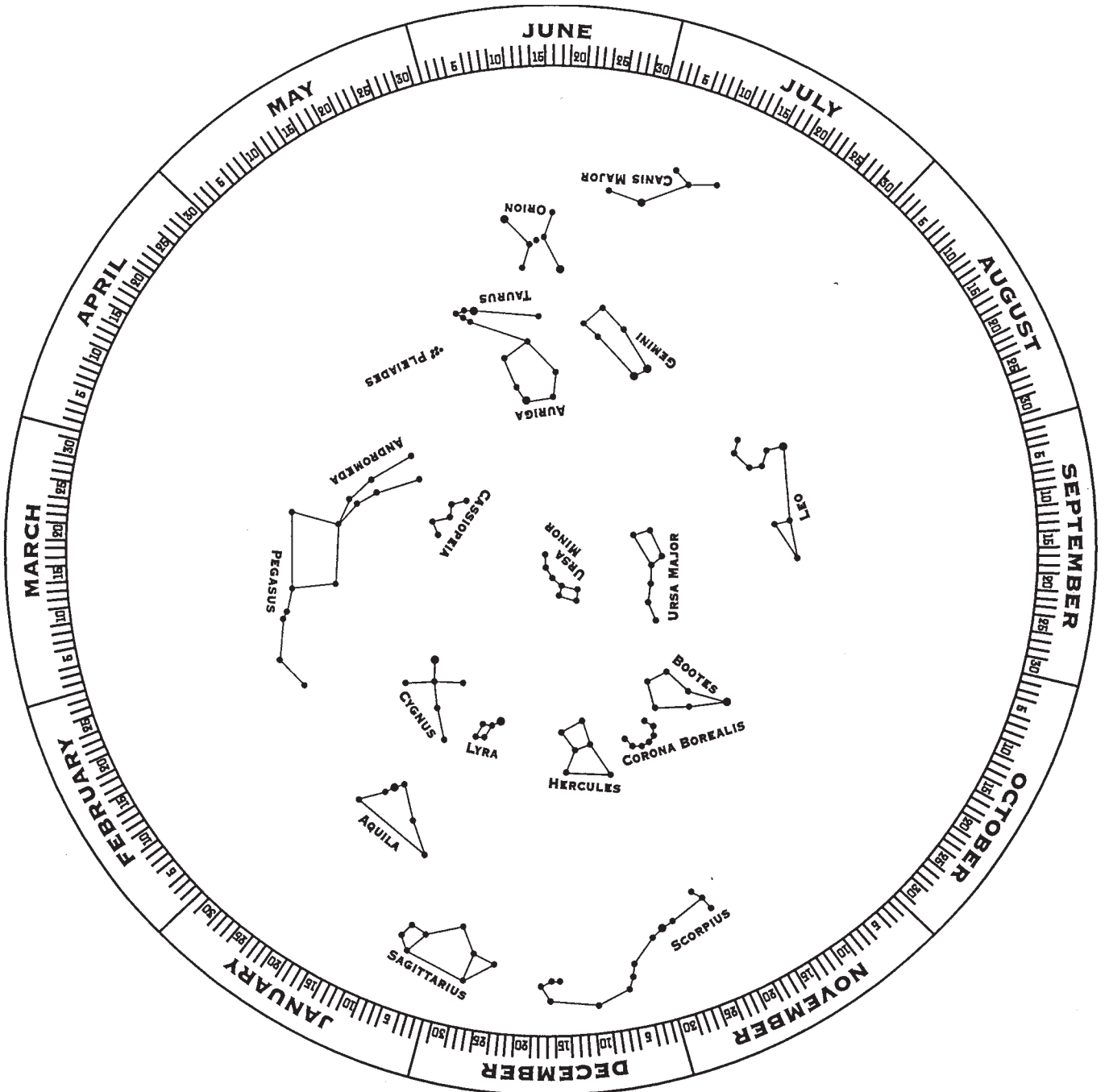
Use the techniques you learn in *Plot Study (Not-so-scary Science)* to record the changing appearance of some part of the night sky.

# STAR FINDER HOLDER



# STAR WHEEL

## SIMPLE STAR FIELD



# STAR WHEEL

COMPLEX STAR FIELD

