

# How to Use a Star Finder

If a student is to become truly interested in the stars, he must be able to identify them as he looks up at the myriad of lights in the night sky. By learning to use a Star Finder in the planetarium — a controlled model of the real sky — students can develop skills to use Star Finders out of doors and competence in identifying stars and constellations.

## Objectives

Students will be able to:

1. Use a Star Finder with some degree of proficiency in locating stars both in the planetarium and in the real sky.
2. Identify specific constellations in the night sky for any specific date with the aid of a Star Finder.

## Process Skills

Describing • observing • interpreting • communicating • inferring • working cooperatively

## Background information

Share the following information with students: A representation of the real sky is provided by a Star Finder. Thus a Star Finder may be used as a tool for locating stars in the sky.

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### Procedure

#### In the classroom:

1. The teacher should duplicate or have printed enough patterns for Star Finders for each student to assemble one. The instructions for assembling and using the Star Finder are provided with the pattern.
2. Using an overhead projector with a transparency of the Star Finder students are using, point out and/or demonstrate the following:
  - A. Time and date
  - B. Proper orientation
  - C. Position of observer
  - D. Cardinal or compass points

Help children get well acquainted with four or more major constellations to be visible in the night sky on date of planetarium visits.

#### In the planetarium:

1. Set planetarium for evening of visit.
2. Distribute Star Finders to the pupils who made them and one red flashlight to every two students. Explain the necessity of working together with one student holding the red flashlight and the other working with the Star Finder.
3. Let the planetarium sun set and help students orient themselves and the Star Finder with respect to planetarium compass points (N, E, S, W). Bring the stars up so that the brightest ones are visible.
4. Students should set their Star Finders by turning the star disk until the date printed on the disk is set to correspond with the time of observing. Face south and hold the Star Finder in such a manner that the stars can be read and the south on the finder points towards the South Pole. Continue holding the finder in position and use the flashlight to locate the stars which match those in the sky. The Finder is designed for latitudes 30°N through 50°N but is useful at any northern mid-latitude.
5. After dimming the side lights enough for more stars to be seen, ask the students to use their Star Finders as above to identify a constellation and/or star as you point it out on the dome.
6. After the above step is accomplished to your satisfaction, turn the side lights down completely and let students

## MATERIALS

- STARLAB Portable Planetarium
- Do It Yourself Star Finder pattern (see pp. 21, 22)
- Starfield Cylinder
- glue sticks
- arrow pointers
- scissors
- red flashlights (for reading)

observe the "real sky." Let students use the arrow pointer to outline constellations on the dome.

7. Sum up the planetarium experience of the value of a Star Finder.
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### **Follow-up Activities**

1. Each student should take his/her Star Finder home and use it to locate the same asterisms and constellations in the nighttime sky that he/she observed in the planetarium.
2. Plan a night observation session with students and use the Star Finder to locate objects in the real sky. (For a star party, incorporate activities for parents.)
3. Ask several students to make a comparative study of other types of star finders and to use one or more of them. They should report results to the class.
4. Assign charts of various types to other students, with the request that they locate five stars in the sky at night and later report on their stargazing experiences.

### **Evaluation**

Point to a constellation or asterism (one or several) and ask students to locate it on their Star Finders, marking it with a circle. Evaluate each student on his performance in the post activities.

List several stars and constellations by name and ask students to use their Star Finders to determine the month each star and constellation would be visible at 10:00 p.m. and to name the general area of the sky in which the star would appear.

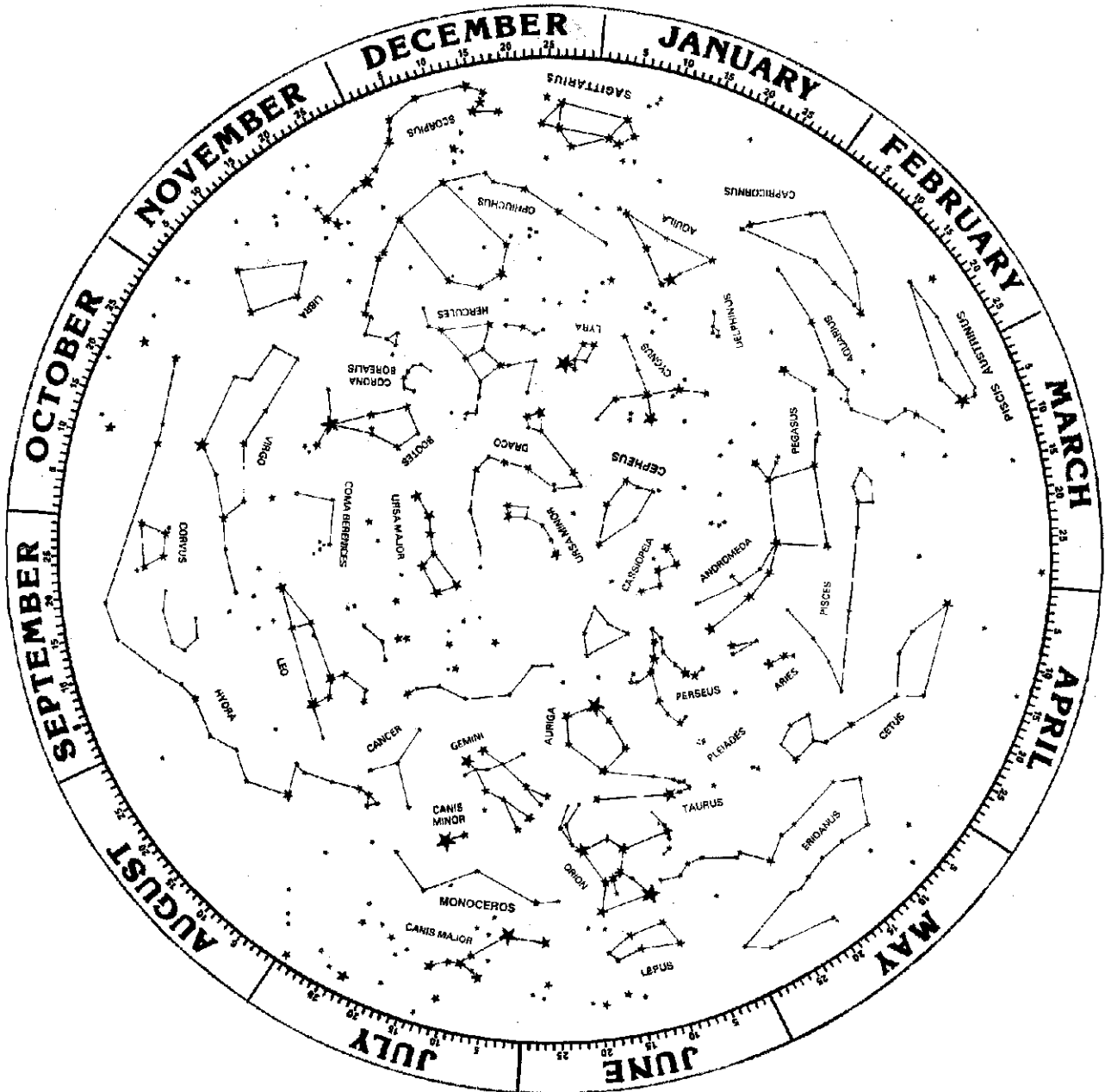
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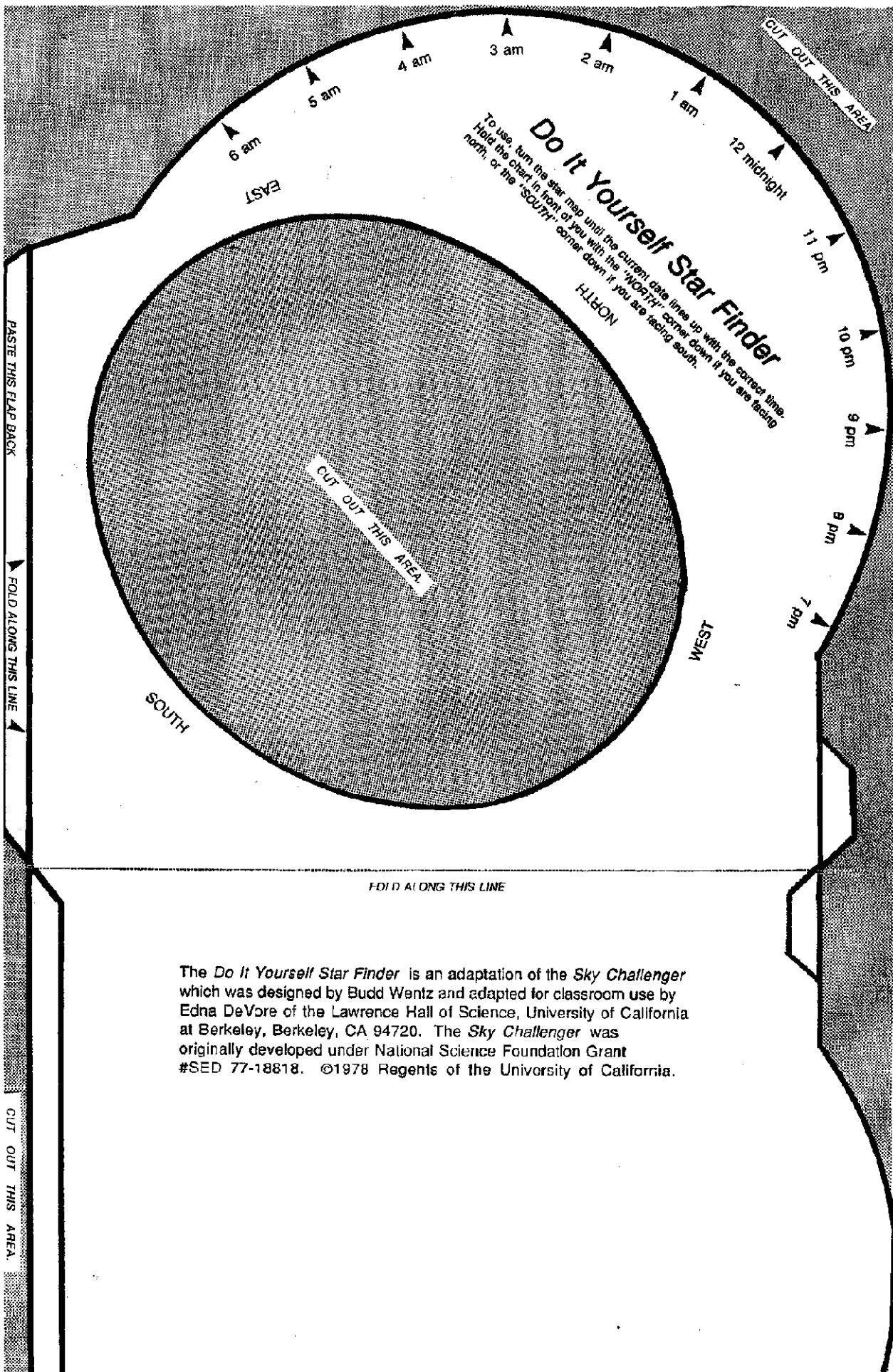
### **Note**

For Do It Yourself Star Finder pattern used in the activity, see the next two pages. These Star Finders are also available from Learning Technologies on a heavy-duty cardboard. Call toll-free 1-800-537-8703 or 1-617-628-1459 for more information.

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# How to Make a Do it Yourself Star Finder





# How to Use a Dipper Finder

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Children will start feeling at home with the stars and will become interested in observing them further when they realize that they can easily find the Big Dipper on a clear night. The Big Dipper, in turn, will help them locate a very important star for finding their way, Polaris. The Dipper Finder to be made in this activity will tell them in what general region of the north sky to look for the Big Dipper at any hour of the night throughout the year. As they use it, they will see how the Dipper appears to move around the Pole Star.

## Objectives

Students will be able to:

1. Use the Dipper Finder to locate the position of the Big Dipper at selected hours and months of the year.
2. Locate the North Star (Polaris).

## Process Skills

Describing • observing • interpreting • communicating • inferring • working cooperatively

## Background information

Share the following information with students.

The Big Dipper appears to move in the sky from hour to hour.

The Big Dipper appears to change its position from month to month.

The pointer stars in the Big Dipper point toward the North Star (Polaris).

## MATERIALS

- STARLAB Portable Planetarium
- Dipper Finder pattern and instructions (see p. 25)
- Starfield Cylinder
- paper fastener
- arrow pointers
- glue sticks
- red flashlight (for reading)
- scissors

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## Procedure

In the classroom:

1. Review rotation of the earth, shape of the Big Dipper, and the usefulness of this star configuration in finding the North Star and cardinal points.
2. Ask students to construct the Dipper Finder using the materials given them.
3. Let students practice setting and orienting the Dipper Finder for various dates and hours of night until they become familiar with its operation.

In the planetarium:

1. Preset the planetarium for the date of the visit and for one hour after sunset.
  2. With side lights up, ask students to set their Dipper Finders for the date and time of the STARLAB setting and determine the approximate region of the north sky where the Big Dipper will be found.
  3. With the students, identify cardinal points, horizon, meridian, and zenith.
  4. Activate the stars, lowering the side lights until the Big and Little Dippers are visible (but maintain as much room illumination as possible). Each student should verify his predicted orientation of the Big Dipper with its position in the planetarium sky. Ask students to observe the position of the North Star (ask them this again in connection with all later observations).
  5. Using diurnal motion, advance the sky two or three hours at a time through a 24-hour period. Before each advancement, students should reset their Dipper Finders for the correct time and make a prediction on the Dipper's location. Following each advancement they should observe the position of the Dipper in relation to their prediction as well as the horizon, zenith, and other stars.
  6. Using annual motion and the ecliptic, and the same inquiry procedures as above, show the position of the sun by season and the position of the Dipper in the evening sky on the same date.
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### Follow-Up Activities

1. Each student should take his Dipper Finder home and use it to locate the Dipper and North Star in the night sky.
2. The Dipper Finder is large enough to include more stars. Ask students to plot the Little Dipper, Cassiopeia, and Draco on their Dipper Finders from the sky at night. On the next school day, they should check their success with a star chart.
3. At upper elementary levels, guide students in using their Dipper Finders and the Big Dipper to tell the time of night (see Engelbriktson, Greenleaf, *Let's Explore Outer Space*, pp. 24-36 for directions for using the Big Dipper as a clock in the sky).

### Evaluation

Show the Big Dipper in four different positions at 9 p.m. on the planetarium dome and ask students to use their Dipper Finders to discover the month in which each position would occur.

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### Note

For the Dipper Finder pattern used in the activity, see the next page.

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# Dipper Finder Pattern and Instructions

## Construction

1. Cut out the circle and rectangle and glue-stick both onto tag board. Trim tag board to exact size of circle and square.
2. Fasten circle to rectangle by putting paper fastener through Polaris.

## Use

1. Line up the date of observation with the time of observation. For example, if it is 10 p.m. on April 11, turn the month wheel until a point about a third of the way into the space marked "April" is aligned with 10 p.m. on the square card.
2. Hold the card up so that the north horizon on the card corresponds with the north horizon in the planetarium or real sky.

