

# Night Time Is the Right Time

*Students can learn a lot about the stars  
if they just take the time.*

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*By Bob Riddle*

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**B**efore the invention of modern time-keeping devices, people looked to the stars for guidance. Ancient cultures told time by the sky, using the sun and certain other stars to determine the time of day or night and the passing of the seasons.

The apparent movement of certain stars and constellations around the North Star is caused by the regular rotation rate of the Earth around its axis. Some of these stars and constellations never set and consequently are known as north circumpolar objects.

For people in North America, two familiar north circumpolar patterns are the Big Dipper and the Little Dipper [see fig. 1]. Properly known as asterisms, these are not entire constellations but rather parts of ones—Ursa Major, or the Great Bear; and Ursa Minor, or the Little Bear, respectively. The North Star, Polaris, is found in Ursa Minor. It is the end star in the handle of the Little Dipper. Point out to your students that two stars in the Big Dipper point toward the North Star.

Because the Earth rotates, the Big Dipper appears to circle around the North Star every 24 hours. Link your class to the past by teaching students how to use the Big Dipper as a night sky clock.

To create the clock, you will need

- the patterns on the opposite page;
- cardboard, posterboard, or heavy construction paper;
- brass paper fasteners, enough for the class;
- and paste.

Photocopy the patterns and distribute to the class. Have the students paste the patterns onto the sturdy backing you have chosen. After the paste has dried, the students can cut the patterns out and trim them neatly. Then they simply center the month dial on top of the base dial and fasten with a brass paper fastener.

After the clocks have been fashioned, you may have to send the children home with instructions on how to use

them. If you're lucky enough to have a field trip to your local planetarium, or a block of time scheduled for an evening when stars are visible, lead the activity yourself.

Go outside, face north, and locate the Big Dipper. Hold the clock so that the words "North Horizon" are at the bottom. Rotate the month dial until it matches the position of the Big Dipper in the sky. The approximate time can be determined by matching the current month with the clock time.

Ask the class some questions:

- "When you are looking at the North Star, you are facing in what direction?"
- "How long does it take the Big Dipper to make one complete rotation around the North Star?"
- "In which direction does the Big Dipper appear to rotate?"
- "Why does the Big Dipper seem to circle the North Star?"

Centuries ago, explorers found new worlds because their ancestors had charted the stars. Our children's children will sail among the stars, where they too will find new worlds. It's not too early to teach them the skills they'll need on those voyages.

## Resources

- Adzema, R., and Jones, M. (1978). *The great sundial cutout book*. New York: Hawthorn.
- Colonial School District. (1983). *Our sky clock*. Level 3 Teacher Guide. New Castle, DE: Author.
- Jobb, J. (1977). *The night sky book*. Covella, CA: The Yolla Bolly Press.

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Figure 2

**Tell Time by the Big Dipper**

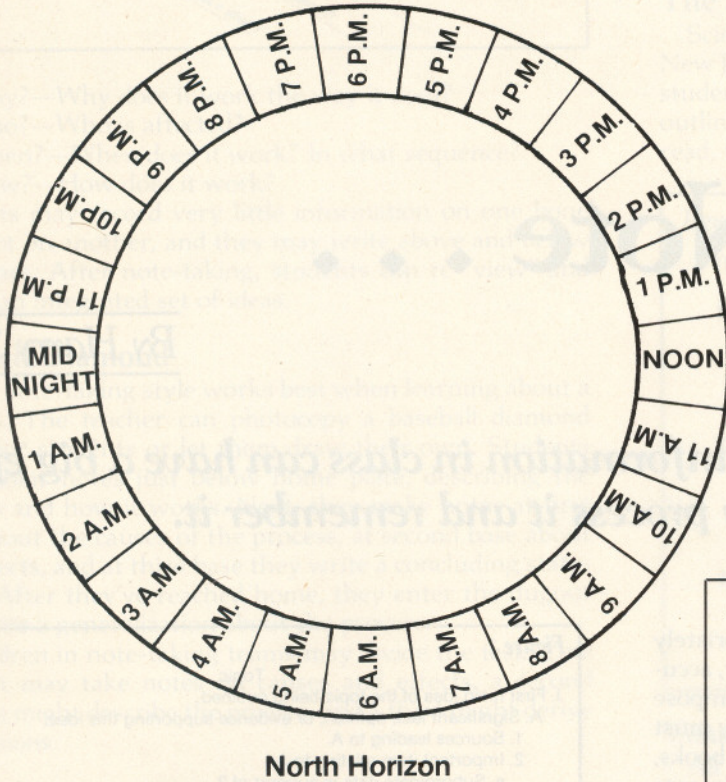


Figure 3

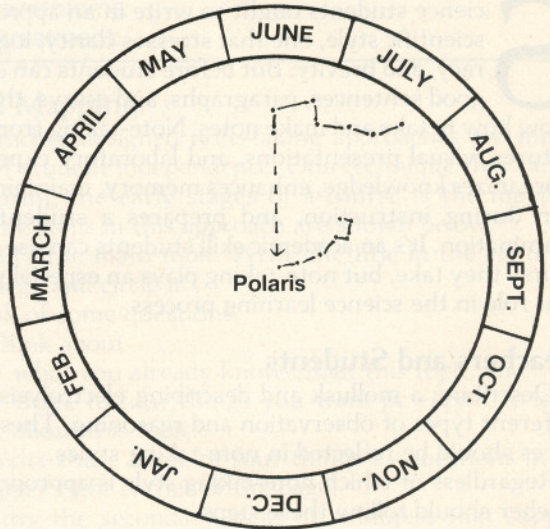


Figure 1 shows the Big and Little Dippers within their constellations. Figures 2 and 3 are the patterns for the sky clock. After the patterns have been pasted onto sturdy backing and cut around their outer perimeters, the month dial is fastened on top and at the center of the hour dial with a brass paper fastener. At night, students simply line up the star patterns and the north horizon to find the time.

Figure 1

