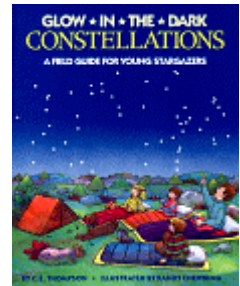


Star Clock

Teacher's Notes

Supplies (for a class of 30 students):

1. *Glow in the Dark Constellations* (by C.E. Thompson; ISBN 0-448-41253-5)
2. Star Clock poster
3. 30 pairs of scissors
4. 30 star clock instruction sheets (best if copied on card stock or heavy weight paper)
5. 30 paper fasteners (brads)



Introduction:

In this lab students will have the opportunity to use the stars to tell time just as people had for thousand of years. They will find that the stars appear to rise in the east and set in the west, and that those stars near the North Pole appear to go in circles around it. However, the stars do not really rise and set. Earth spins about its axis once a day giving the appearance that the stars are moving.

The activity will start with a short introduction to stars and constellations. Students will then make a star clock appropriate to their geographic location. They will practice using the star clocks using a poster representation of the night sky. The students should be encouraged to try using these clocks at home during the night. This activity is recommended for 4th - 8th graders.

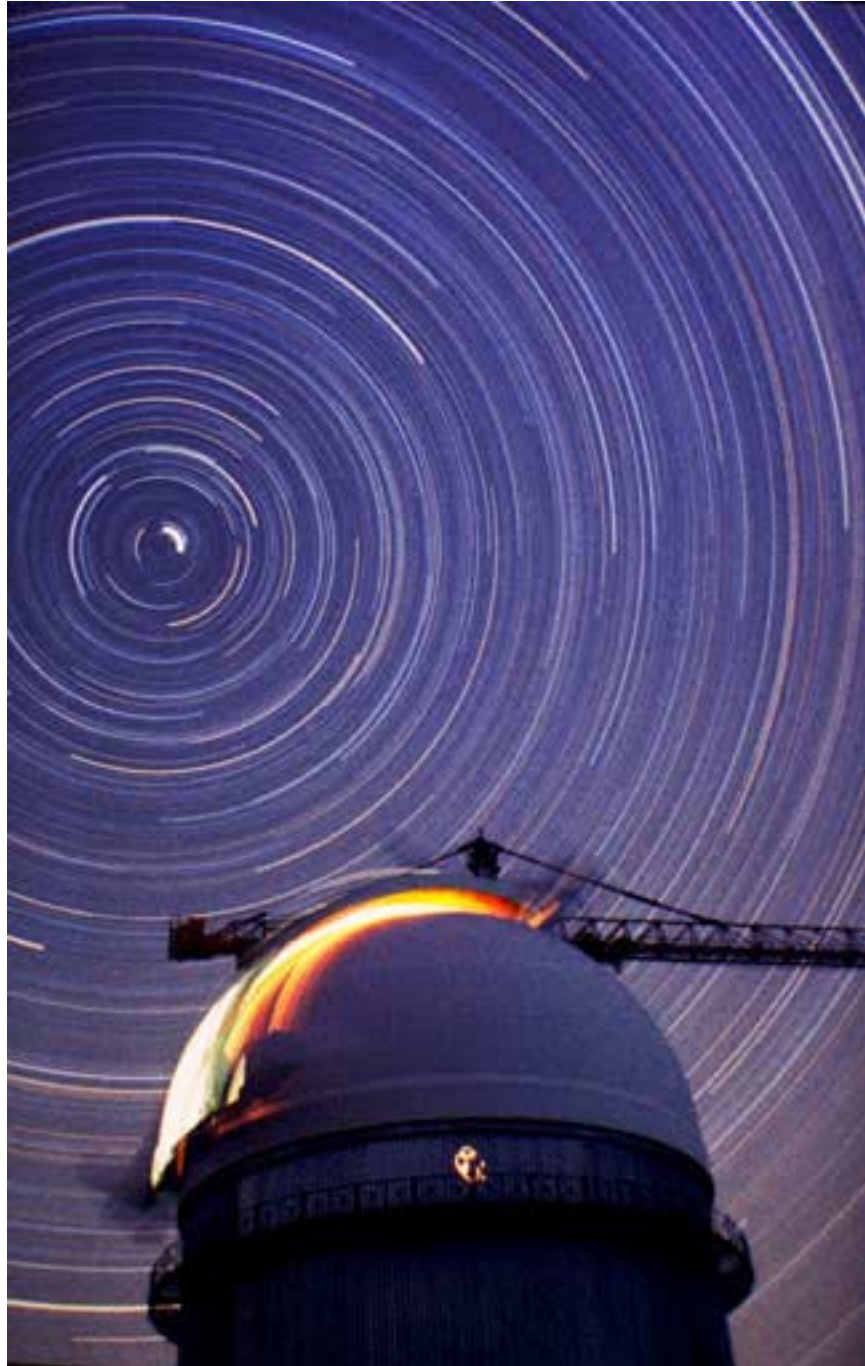
Activity 1: Book and Discussion

Start by reading the chapter titled “An Introduction to Star Gazing” in the Constellations book included in the lab package.

Expand upon this reading by discussing the paths the stars appear to travel in the course of an evening. Since Earth is spinning along its axis, stars near the North Pole will look like they are traveling in a circle around the North Star. Therefore, if you pointed your camera at the right spot (Polaris) and took a time-lapse photo it would look like the ones below.



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Activity 2: Making a Star Clock

Pass out an Instruction sheet to each student. Have the girls cut out both circles and attach them as shown on the instruction sheet.

Activity 3: Using the Star Clock Indoors

Since the lab is most likely down during the daytime, girls will learn how to read their star clocks using the poster included in the kit. The star clock uses the orientation of three constellations: the big and little dipper and Cassiopeia (the W) as the basis for determining the time.

1. First, using the constellation book, show the girls what these three constellations look like.
2. Hang up the poster in the 7 PM position.
3. Have the students hold their star clocks so that the current month is at top. Now have them turn the inner circle until the constellations look just like the ones on the poster.
4. Read the time by looking in the "THE TIME IS" window. Make sure everyone is reading the correct time to within an hour.
5. Remind the students about the stars traveling in circles. Rotate the star poster and ask the students to read the time. Repeat this until all students have the correct concept.
6. The Star Clocks can also be used as alarm clocks. Slowly rotate the star poster and have the students say 'buzz' when it reads 6 am.
7. Encourage the students to use the star clocks at home. Remind them to add an hour if it is daylight savings time.

Activity 4: Using the Star Clock Outside

1. Find the Big Dipper and the North Star, as shown on the face of your Star Clock.
2. Face the North Star, as shown on the front of the clock.
3. Find the current month around the outside circle of the Star Clock. Put your thumb over the current month. Hold your Star Clock so the current month, marked by your thumb is AT THE TOP.
4. Holding the large disc firmly with the current month at the top, turn the smaller disc until its stars line up with those in the sky.
5. Read the time in the window.
6. If you are on Daylight Savings Time, add one hour.

Acknowledgement: This activity is taken from the Earth Moon and Stars GEM book from Lawrence hall of Science, U. C. Berkeley. An interactive on-line version of this activity is available at <http://www.lhs.berkeley.edu/StarClock/starclock.html>