



SPRING | Sun Telling Time: No Clock Necessary!

Summary:

We think about the sun as a source for light, warmth, and energy but did you know we can also use the sun to help us tell time? Today, we're going to explore an old, but very reliable, way to tell time. Try to time your visit so that you are in the garden over the noon hour.

Before Visiting the Garden:

Gather: A wall clock or watch (something analog), a 12 inch or greater square piece of cardboard, an old paper towel tube, tape (or ahead of time hot glue the paper towel tube to the center of the cardboard), thumbtacks, and a dark marker

Explore: Images of the Samrat Yantra, the world's largest sundial located in India.

Read: *Anno's Sundial* by Mitsumasa Anno. This book provides simple explanations of how the sundial works and instructions for creating your own.

In the Garden:

Before cell phones, digital clocks, and watches, people used sundials to tell time. These clocks require no batteries or advanced technology. Instead, they rely on the sun, orientation to the Earth's axis, and the natural shadows created to help people tell time.

Questions to Explore:

- How do you tell time? Can you tell the time on the clocks we brought with us?
- Do you use different methods for telling time? If so, can you list them?
- Have you seen a sundial before? Where?
- What other measurements can we determine from the sun? (ex. changing seasons, temperature, etc.)

It is important to understand how the sun affects your plants and the way they grow so they don't get too much sun or too much shade. We can also use the sun to help us track our time in the garden.

Activity:

Create a Simple Sundial

1. Place your piece of cardboard in a sunny, central location in the garden.
2. Fasten your tube to the center of the paper (use your ruler to determine the center point) with tape.
3. At noon, place a thumbtack on the end of the shadow you observe. Draw a line between the tube, known as a gnomon, and the thumbtack. This is your 12:00 line.
4. If you do this project on a day when you plan to spend a few hours prepping or tidying the garden, set a timer for one hour increments and stop to create a new line at each new hour. Or, you can continue your observations in a sunny spot at home, but remember to orient your sundial in the same cardinal direction as you had in the garden—for example due North.

Beyond the Garden | Get to Know Your Local Meteorologist

Our cardboard sundial is helpful for beginning to explore telling time with the sun, but as you might expect, it might have a hard time holding up in the rain. Look for other sundial examples. They are often installed in parks, botanical gardens, science centers, or in your neighbor's garden! Once you have explored a few examples, brainstorm together to create a more permanent sundial for your yard or at the garden. See what you can create with an old inverted terracotta saucer, a slice of a tree stump, or leftover lumber. Paint and create to your heart's content.

Continue Exploring | Supporting Materials

Activities from the McDonald Observatory: <http://mcdonaldobservatory.org/teachers/classroom>