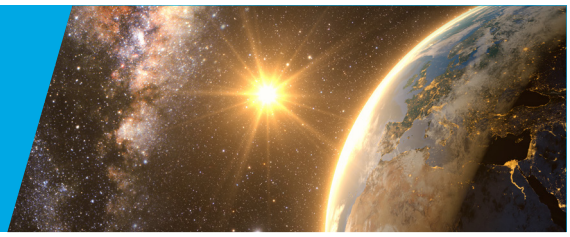
CURIOSITY AT HOME

MAKE A SUNDIAL



The hours of sun increase each day, until we reach the Summer Solstice on June 21st, when the sun is highest in the sky and we have our longest day of the year in the northern hemisphere. Observe the patterns of the sun moving across the sky by making a sundial to measure time!

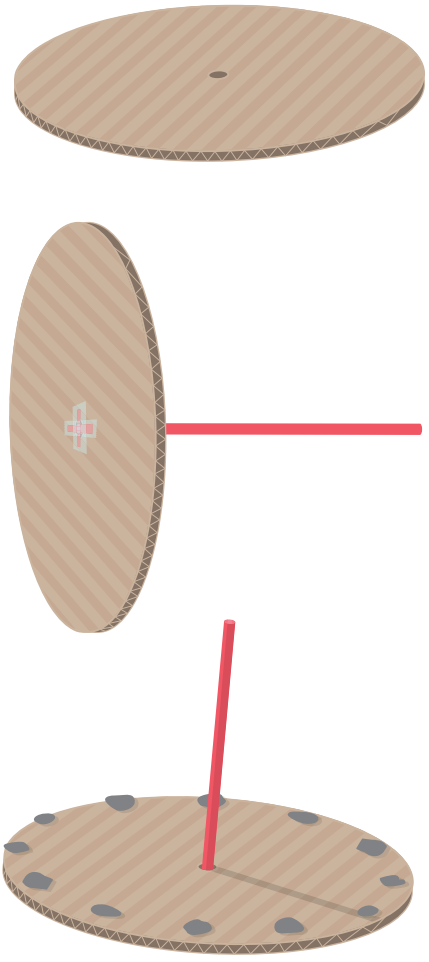
MATERIALS

- Paper plate or piece of cardboard
- Gnomon (can be a straw, pencil or a thin dowel)
- Tape
- Watch
- Scissors
- Markers
- 12 stones (optional)
- Paint (optional)
- Science notebook (or paper)
- Something to write with

PROCEDURE

- Cut out a circle of cardboard about 10 inches in diameter, or use a paper plate. This will become the base of your sundial.
- Put a small hole in the center of your circle. Insert the vertical pole, known as a gnomon. This is the item that will cast the shadow on your sundial. If you use a straw, you can make a few snips in the end to open up on the backside of the flat surface and tape it down for stability. Make sure your pole will stay in place, using tape.
- (Optional) Paint numbers 1–12 on 12 small stones.
- Carry your sundial outdoors with your watch and some stones (or a marker) ready. Do this is on a sunny day, between the hours of 9 a.m. to 3 p.m. works best.
- On each hour, mark the location of the shadow on the sundial base. Refer to your watch to determine what hour it is. Write the number on the sundial base at the spot where the shadow falls, or place the corresponding stone. When you record the first hour, slightly tilt the gnomon towards that number and leave it tilted at that angle for the rest of the time.
- Check your sundial each hour, on the hour, and mark the shadow's location with your marker or painted stone. Continue forming your sundial face, with numbers 1–12, just like a clock.

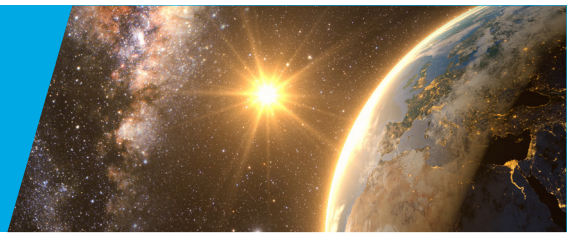
  TIP: Be sure to stand in the same place every time you record a new number on your clock for more accurate results.



Experiment continued on next page...

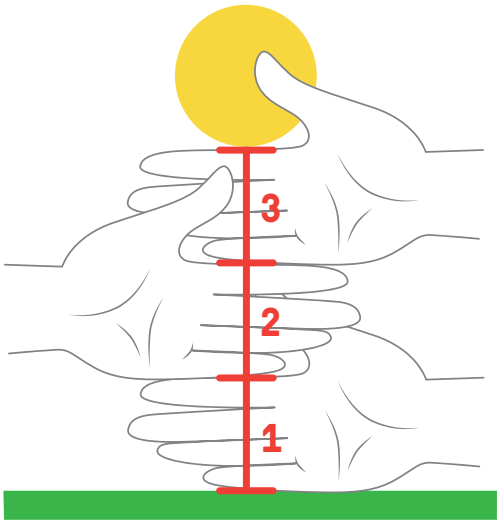
CURIOSITY AT HOME

MAKE A SUNDIAL



EXPLORE MORE

Try out another way to tell time, with the width of your hand! It is best for figuring out the number of hours until sunset, but you can also use it to deduce time IF you know when sunset is, AND you can see the sun. Reach one hand out, fully extended in front of you with palm facing you, and line up the edge of your pinky with the horizon (or an estimate of the horizon if there are objects blocking your view). The distance to the top of your forefinger represents ONE HOUR. Use your other hand to stack one hand on top the next until you reach the bottom edge of the sun. If you have 3 hand widths to the bottom edge, its 3 hours until sunset! Be mindful not to look directly at the sun to avoid damaging your eyes!



DID YOU KNOW?

Sundials are the oldest known instrument for telling time. They are found all over the world, and were used before clocks, watches and electricity. The oldest known sundial dates back to 700 BCE, although there are even older versions that consist of simply a vertical pillar. The vertical stick, placed at the center of a sundial, is called a gnomon. As the sun moves across the sky, the gnomon casts a shadow all around onto the flat surface. We can mark these places on the surface, with rocks, sticks, numbers or other objects to serve as indicators of the time of day.

Examples of sundials from around the world.

Experiment continued on next page...

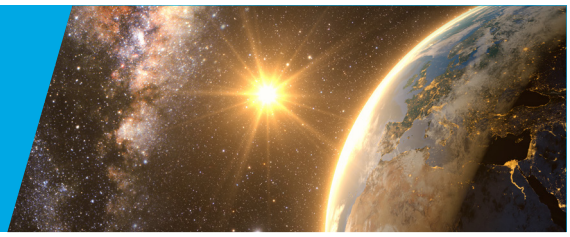
@pacsci

Show us how you're being curious! Share your results with us.

PACIFIC SCIENCE CENTER

CURIOSITY AT HOME

MAKE A SUNDIAL



K–2 GRADE EXPLORATION

- How does the sundial compare to your own shadow? Could you use yourself as a gnomon?
- Why are some shadows long and some short?
- What happens to the sundial or your own shadow at noon?
- Use a round ball of green or blue playdough with a toothpick through the middle and a larger ball of yellow for the sun, to demonstrate how the earth tilts toward the sun. Demonstrate the earth moving around the sun making day and night and the four seasons. How does the light from the sun change here on earth as the earth moves around the sun?
- Make Solstice Crowns: celebrate the Solstice by preparing flower crowns to wear on the longest day. Gather any flowers with stems 2–3 inches long, some green floral tape and some craft wire. Measure the wire to the child's head and twist wire to close. Then cover the wire with tape, wrapping it round and round. Go around the crown a second time with the tape, wrapping the stems or any leaves into the crown. When finished trim as desired. Refrigerate if needed overnight.