

Designed for families with kids ages 7 and up

Follow the movement of the Sun with this homemade sundial, and notice changes over different periods of time.

What you'll need:

- 1 sheet of white or light colored paper
- Scissors
- Tape
- Pen or pencil

FIRST, make your Sun Tracker

Step 1:

- Cut (or fold and tear) a strip of paper about 1 inch wide off the edge of your sheet.
- Save the large piece of paper for a later step.

Step 2:

- Fold the strip in half and set it down with the fold on top.

Step 3:

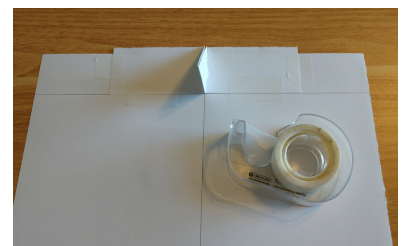
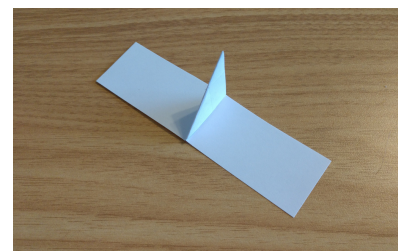
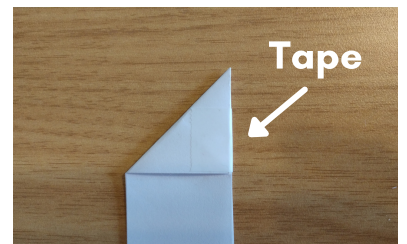
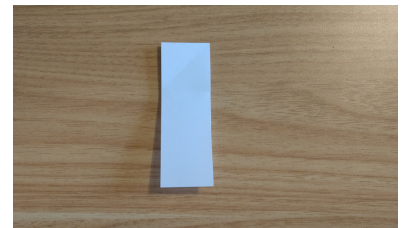
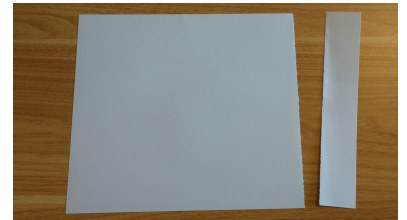
- Fold one top corner down so it meets the other side and makes a triangle. Press it flat.
- Tape that corner down so it does not unfold, wrapping the tape around the side.

Step 4:

- Open up the two loose flaps underneath the triangle and fold them out to the sides.
- You want the point of your triangle to aim straight up and the bottom to sit flat.
- This piece is called a gnomon (pronounced "NO-mon") on a sundial and it is what will create the shadow on your Sun tracker.

Step 5:

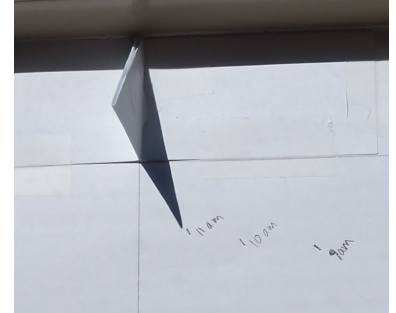
- Place your gnomon on your leftover piece of paper so the flaps align with one edge and the triangle points in towards the center of the sheet.
- Tape it down so it stays in place. Now you're read to set up your Sun tracker!





THEN, set up your Sun Tracker

- Find a flat surface to place your tracker where the Sun can shine on it.
 - Indoors, this may be a windowsill, table, or shelf near a window.
 - Outdoors, this might be a table, bench, or the ground.
- Try a few places and see where your tracker gets the most Sun. Rotate your tracker until the gnomon's shadow falls on the paper.
- Once you have a good location, tape your Sun tracker down onto the surface, or put small weights on the corners, so it will not move.



FINALLY, follow the Sun's movement

The Sun appears to move across our sky, from sunrise to sunset, because the Earth is rotating. As the Sun moves, the shadows of objects it shines on will change shape and direction. Your Sun tracker makes a shadow that shows you those changes!

Option 1: Track one hour of the Sun's movement

- When the Sun is shining on your tracker, use a pencil to mark the point of your gnomon's shadow on the paper, and label it with the time.
- Do this every ten minutes for one hour, and notice how the shadow moves.
- ***How much did the Sun move in the sky during the same time?***

Option 2: Track one day of the Sun's movement

- Starting in the morning, or when the Sun first hits your tracker, mark the point of your gnomon's shadow and label the time.
- Do this once per hour for the whole day, or as long as the Sun is still shining on your tracker.
- ***How much does the shadow path change if you track two different days a few weeks apart?***

Option 3: Track six months of the Sun's movement

- You will see a big change in the Sun's angle over six months, especially if you start in June or December around the solstice, because the Earth is tilted.
- Pick a starting day and time (midday is best), mark the point of your gnomon's shadow, and label it with the date and time.
- On the same day of the next month, at the same time, mark the point of the shadow again and label it. (If it's cloudy, try again the next day!)
- Do this every month for six months, and notice how much it changes!
- ***How did the Sun's height in the sky change over that same period of time?***

Air and Space Connections

Sun trackers aren't just for people on Earth: [a lunar gnomon like this one](#) was used on the Moon by Apollo astronauts. Its shadow was visible in the pictures they took, which helped people back on Earth figure out which direction the Sun was shining.