

# Sunshine and Shadows



Have you ever noticed how your shadow changes during a long sunny day? The sun's angle in the sky varies depending on the time of day and year, so get outside on sunny days throughout the year to have fun with shadows.

## GOBLINS AND GIANTS



Can you make yourself into a shadow goblin at midday and a long-legged shadow giant in the evening?

### What you need

Tape measure.

### What you do

- Go to an open space on a bright sunny day and experiment with shadows.
- Get someone to measure how long your shadow legs are at different times of day. When are you a short fat goblin? Or a tall skinny giant?
- Do the same thing on another sunny day at the same time, in another season. Record the differences.
- Measure your height.
- Find out if your body can produce vitamin D. If your shadow is shorter than your height, then it can, because the sun is high enough in the sky! With that in mind, who will get the most vitamin D, Goblins or Giants? During winter or summer?

## MAKE A SHADOW CLOCK



A fun way to record how the earth moves relative to the sun during the day.

### What you need

A long stick (about 3ft/1m) and several shorter sticks.

### What you do

- On a sunny morning push one end of the long stick into the ground in an open space, maybe at the beach or in the middle of a lawn.
- Every hour on the hour, mark the tip of the long stick's shadow with a short stick. You can also label each short stick with hour, number, time.
- You can return to it at any time on another day and determine the time of day by noting where the tip of your shadow lands!
- Measure the shadow's length as each hour passes. It shows us that the earth moves relative to the sun - shadows are longest when the sun is lowest in the sky, both early and late in the day.

## SCIENCE\*

- The Earth's rotation around the sun is not constant, it changes throughout the year.
- Before the days of clocks, people estimated time by watching how the sun moved across the sky, marking the changes of the shadow of a stick to indicate the passage of time.
- Day, length, and sun strength are different in summer and winter due to how the Earth's axis tilts. In summer, the sun's rays hit the Earth at a steep angle. Light is more focused than in winter, increasing the amount of energy hitting any given spot. Read more [here](#).
- If your shadow is shorter than your height, then your body can produce vitamin D from the sunlight but if it is longer, this means that the sun is too low in the sky and the wavelengths of UVB light needed to produce vitamin D will not be available. We can only make vitamin D from sun exposure when the sun is high enough to produce the strength of wavelengths needed, which in the UK is at certain times during the day from April until October.

\*Click the hyperlinked texts for useful resources and additional information.

### Safety tips

- Follow [sun safety recommendations](#) including covering up with suitable clothing and sunglasses and using at least factor 30 sunscreen.

