

Questacon at HOME

Activity sheet - Shadows

Experimenting with Shadows

Have you ever seen a shadow and wondered how they are made? What's the weather like when you can see your shadow? Do shadows outside stay the same throughout the day or do they change?

You will need:

- A sunny day
- An area of concrete, pavement or tile
- Piece of paper or paper plate
- Chalk and/or marker
- Pencil or a ruler, BluTac or plasticine



Changing Shadows

What to do:

- Go outside on a sunny morning and investigate the shadows you can see.
- Stand on an area of concrete and look at your own shadow.
- Get a grown-up to trace around your shadow with chalk, also trace around the persons feet so that you can stand in exactly the same spot later on.
- Go outside again a couple of hours later, stand in the same spot and investigate how your shadow has changed. Trace around your shadow again.
- Look at where the sun is in the sky, talk about why your shadow is changing, where will your shadow be later in the day? You could try this experiment with some of your toys too!

What's happening?

During the day your shadow will move and change size. This happens because the Earth turns around (rotates) once every 24 hours. The Sun stays in the same place, relative to the Earth, but as the Earth turns the Sun appears to move across the sky. As the Earth rotates the direction the sun is shining from changes, this also changes shadows.



Make a Sundial

What to do:

- On a sunny day, use BluTac or similar to stick something thin, like a pencil, upright on a paper plate or piece of paper.
- Look at the shadow from the pencil and use a marker or chalk to trace the shadow.
- Check the time and write this next to the shadow. For younger children you can mark where the shadow is during breakfast, morning tea, lunch etc. for older children you could mark the time every hour to make it more like a clock.
- Go outside regularly (every hour or two) and mark where the shadow is now.
- Continue this process throughout the day and think about why the shadow is moving.
- The next day revisit the sundial, try using it to tell what time of day it is?
- Would a sundial that you made in winter still work the same in summer? Experiment and find out!



What's happening?

As the Earth rotates during the day the position of the sundial relative to the sun changes and in turn changes the shadow. In the past people made sundials to tell the time.

Discover more!

Watch Questacon's early childhood Science Time *Sun & Moon* episode on Questacon's YouTube channel to discover more about how the Earth rotates and how the Sun shines on the Earth.

Make shadow sculptures with art and craft materials from around the house, look at how the shadows made with different materials vary and experiment with making your sculptures different shapes and sizes.

Experiment with a torch to see how shadows change as you move where the light source is. Try using some toys. Can you make the shadows bigger and smaller?

