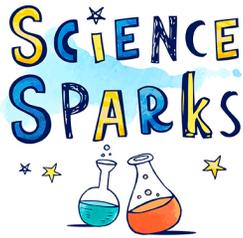
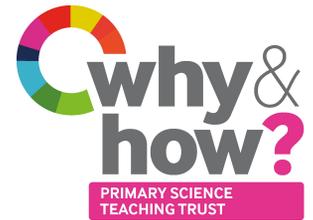


# SCIENCE FUN AT HOME



Have some fun at home with these science activities from **Science Sparks** and the **Primary Science Teaching Trust**



**BEFORE YOU START!** Please read through this with an adult:

- \* Make sure you have read the 'IMPORTANT NOTICE' on the back of this page.
- \* If you have a space outside that you can use safely, then you can do the 'Try this outdoors' activity outside. Don't worry if not as you could still do it indoors.
- \* Talk to your adult about sharing the science you have done and if they want to share on social media, please tag [@ScienceSparks](#) and [@pstt\\_whyhow](#) and use [#ScienceFromHome](#)

## SCIENCE FUN FOR NATIONAL PUZZLE DAY

### 1 TRY THIS INDOORS ... Confused Fish

Amaze and puzzle your family and friends with this optical illusion! Draw two fish on a piece of paper and prop it up behind an empty drinking glass so that you can see the fish through the glass. Then slowly fill the glass up with water while you watch the fish – what do you see happening?

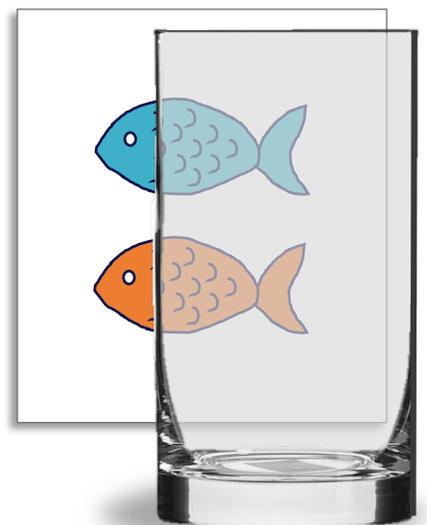
### WHAT DO YOU NOTICE?

#### Things to talk about ...

What changes about how you see the arrows when you pour water into the container? What happens if you turn the fish so they are pointing upwards? What happens if you use a different glass, or move it nearer to or further from the fish? What happens to writing? Instead of using fish, can you write a word that looks the same when the glass is empty and when you pour water into it? What do you know about how we see objects?

### You will need

- \* Drinking glass or another see-through container
- \* Jug of water
- \* Paper and pens



## 2

### TRY THIS OUTDOORS ... Guess the Superhero Shadow

You need a sunny day and someone else in your household for this. Go outside and find a space where you can see your shadow on the ground; early morning and later afternoon might be best for this. Can you make your body into a shape so that your shadow looks like a superhero? Can the other person guess who you are?

#### WHAT DO YOU NOTICE?

##### Things to talk about ...

What is a shadow? How can we tell what object is making the shadow? Why not try making shadows of other shapes, like animals? How can you make a really big shadow, or a really small one?



You could use a sheet or a towel to make a shadow like a cloak and your hands to look like bat ears. The tricky bit is working out how to hide your arms so they don't appear in the outline of the shadow!

## 3

### WHAT IS THE SCIENCE?

We see an object because light travels through air from the object to our eye. When the light passes through another material it gets bent; this is called **refraction**. When light passes through the empty glass, it is bent a small amount and the appearance of the fish hardly changes, but when the light also passes through water it is bent so much that the light rays cross over before they reach our eyes. This is why it makes it look as though the fish are swimming in the other direction.

Shadows are formed when objects block light coming from a light source.

You cannot see details such as facial features within shadows, only the outline of the object that is blocking the light.

## 4

### MORE ACTIVITIES YOU COULD TRY

#### MAKE A TELESCOPE AND LEARN MORE ABOUT LIGHT

<https://wowscience.co.uk/resource/make-a-telescope/>

**HAVE FUN WITH SOME SHADOW PUPPETS** <https://www.science-sparks.com/fun-with-shadows/>

**FIND OUT MORE IN EPISODE 4 'REVERSING ARROW' IN THE 'DO TRY THIS AT HOME' VIDEOS FROM THE INSTITUTE OF PHYSICS** <https://www.iop.org/explore-physics/at-home>

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These activities are designed to be carried out by children working with a parent, guardian or other appropriate adult. The adult involved is fully responsible for ensuring that the activities are carried out safely.