

# LOOKING THROUGH WATER

Explore how light travels using a glass of water and a picture.

## Overview



What happens to drawings when you look at them through a glass of water? All you need is a glass of water, some paper and a pen to find out.

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This page will print, but looks a little funky. Click the button for a PDF version which looks a bit better.

## What you'll need

A glass.

Enough water to fill the glass.

Several pieces of paper or card

A pen or pencil

Colouring pencils, crayons or felt tips

**Suitable for:**

Age 3 up

**Duration:**

10 minutes

**Safety notes**

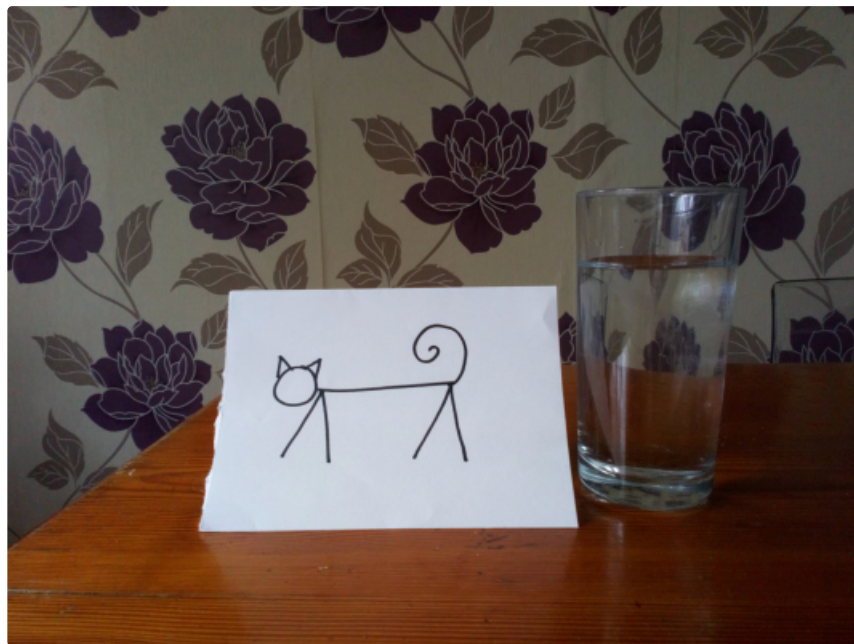
You know your children better than anyone, and you should judge whether they're ready for this activity.

You might want to think in particular about:

- Supervising children when they use a glass
- Pen lids can be choking hazards

## What to do

### Step 1



Fill a glass up with water. Fold a piece of paper in half to make a tent shape. Draw a cat or an arrow on your paper.

### Step 2





Stand the paper up behind your glass. Look through the glass and water at your cat.

What has happened to the cat?



## Things to discuss

Why do you think your cat changed direction?

What could be causing this?

Does it still happen if you use a different shaped glass?



## How it works

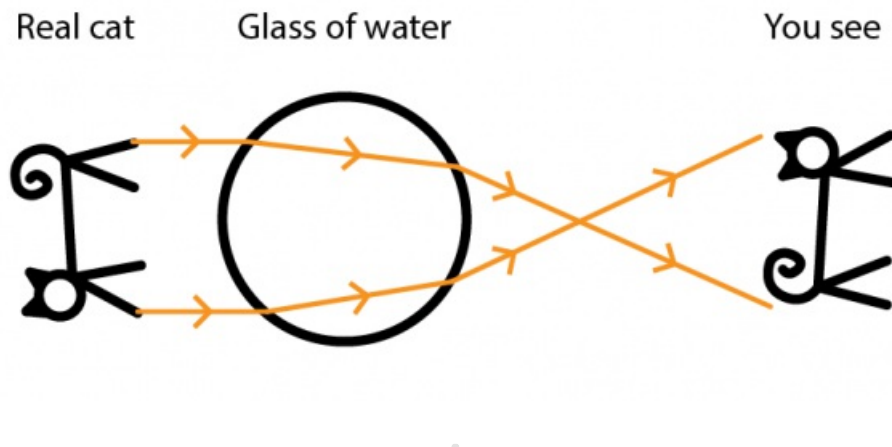
Light always travels in straight lines. For a good video explaining this, go to <https://www.bbc.co.uk/bitesize/clips/zyntsbk>.

We see objects as light bounces off them and into our eyes. The first picture shows the image without the glass. We can see light travelling directly from the cat to our eyes.



In the second picture, we can see that the light gets bent as it travels from air through the glass of water. This bending is called refraction. The glass of water bends the light rays towards each other. After the light rays

bending is called refraction. The glass of water bends the light rays towards each other. After the light rays leave the glass, they cross over each other. Light that was on the top is now on the bottom and the bottom on the top so the cat appears to reverse itself.



## Other things to try

### Reverse writing



Try writing your name or any word on your paper.

What do you think will happen when you look at it through your glass of water?







It is just like looking at writing in the mirror!

Do you think you can write in reverse on your paper and make it appear the correct way around when you look at it through your glass of water?

### Rainbow strips



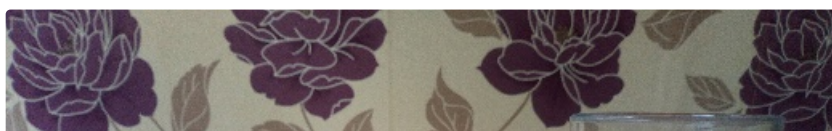
Do you think you can reverse the order of the stripes?

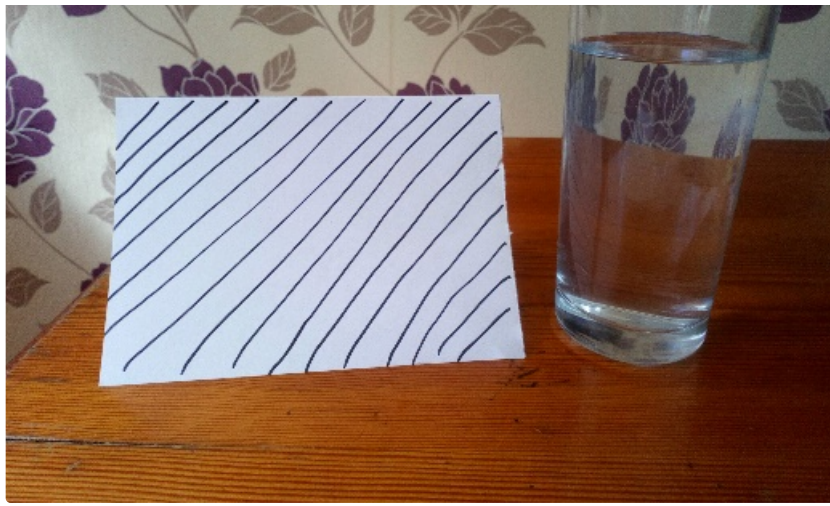
Draw a pattern of different coloured stripes on your paper.

What do you predict will happen?



### Diagonal stripes





This time cover your paper with diagonal stripes. They don't have to be totally straight or equally spaced.

What do you predict will happen when you look at them through your glass of water?



Did you get the result you expected?

Do you think the distance that you stand your paper from the glass makes a difference to what you see through it?

## Cool and crazy patterns

You can have lots of fun creating different patterns and investigating what happens when you look at them through your glass of water. You could try photographing some of your favourite images and uploading them at the bottom of the main STEM at home page <https://nustem.uk/stem-at-home/>.



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