

# Can you pause falling water?

## WATERFALL



(Type)	Ages	Topic	Time
Science background	7-14	Light	<10 mins
Skills used			
Observation - Curiosity			

## Overview for adults

In Waterfall, streams of water appear to hover in mid-air. By changing the speed of the falling water, you can make the water appear to fall slowly or rise upwards. If you stick your hand into the stream of water, you can feel what it is actually doing – falling downwards at a regular speed.

### What's the science?

Behind each stream of water is a set of flashing lights. These lights are flashing so fast our eyes can't detect it. As the lights flash they illuminate the drops of water for a short space of time – enough for our eyes to see them. But in the time it takes for the next flash to happen the drops have fallen a short distance and there is now another droplet in the same place where we saw the last one. Because the droplets look very similar this tricks us into thinking it is the same droplet and that it hasn't moved. This strange illusion is due to the way we mistake one water drop for another because of their similar shapes.

### Science in your world

Although you see lights around you as being always on, modern fluorescent lights behave in the same way as the ones in Waterfall – they flicker too fast for our eyes to see. This means that when you take a photo under fluorescent lights it can come out funny if your camera is fast enough to capture the flicker.

### Things to think and talk about ...

- Feel the water, is it falling at the same speed that you see it?
- Why does the water look like it's frozen in mid-air?

### Things to investigate ...

- What happens if you speed up the water drops? Why?
- What happens if you slow down the water drops? Why?

### Museum links

This effect can cause optical illusions in film and TV. Wheels that are moving forwards can seem to be turning really slowly or even going backwards. Not so good during a high-speed car chase. You can experiment with this effect with the Optical Toys in the Animation Gallery on Level 5.

### Did you know...?

All water drops have a similar round shape when they fall because water is a liquid and takes on the same shape as its container. When water has no container it takes the smallest shape possible, which is a sphere.