

Optical illusion: make your own magical illusion

We are all easily baffled by optical illusions. But what are optical illusions? And how can we make a simple yet stunning illusion at home?

Most optical illusions make use of patterns or colour, sometimes also light or the angle of the observer towards the object to mislead us. Our brain processes the information it gets from our eyes but it does so by creating something that is not there in reality.

Here is a fun and easy way to explore optical illusions at home. This activity will show you how easily our brain is tricked and how this has enabled the film industry to entertain us with more and more realistic films for decades.

What you need

Strong paper or cardboard
Sharpies, colouring pencils or crayons
Scissors
Sellotape
Re-usable drinking straw or pencil

What to do

1. Cut the paper or cardboard into an approximately 5x5 cm square or a rectangle of similar size.
2. Think about the picture you would like to draw. Can you divide it up into two pieces? That can be, for instance, a flower and a flower pot, the trunk and the crown of a tree, a tree and bird, a fish in a fish bowl – up to your imagination!
3. Now draw only one piece of your picture on each side.
What's important is that you finish one piece on one side exactly where the second piece on the other side begins. This is easier when you either mark the position of both pieces that make up your image or, if you are using strong paper, you might be able to see what has been drawn on the other side when you hold it up against the light.
4. Use the Sellotape to tape your picture onto your drinking straw or pencil. The drinking straw or pencil is going to hold up your picture, make sure it is well taped to the top end of the straw or pencil.
5. Take the straw or pencil between both palms and rub your hands to make the picture spin. What do you see?



Use colouring pencils to draw one part of an picture onto one side of a piece of cardboard or strong paper. Mark where this image begins so you can align the second part of the picture on the other side. We are using the third blue line after the red one here in this example.



Draw the second part of your image. Together, they should give one complete picture. Use Sellotape to tape the piece of cardboard or strong paper onto a re-useable drinking straw. Then spin the straw between your palms until the two images merge into one picture.

How it works

When it is spinning fast enough, the brain can't distinguish between the separate pictures on each side of the cardboard or paper. This is why the two separate pictures seem to blend into one.

This is also how flip books work. Can you come up with a simple story and make one? A flip book requires a bit more work and you will have to be very accurate where you position your images and how they change from page to page but it is worth the effort.

The same effect is also used in films. In films, many consecutive images appear one after the other in very quick succession. This is called the frame rate (frames or images per second). Our brain can only perceive about 10 to 12 images per second and see them as separate images. Any more, and we see motion. When you compare older films to what we have today, you will notice a difference in how smooth motion appears. Films started at a frame rate of 16 to 24 frames per second but thanks to technological progress most films are now shown at 50 to 60 frames per second.