



SUPER POWER: Optical illusions!

THAUMATROPE

LAB NOTES...

WATCH & BUILD
20
MINS

YOU WILL NEED

- 1 x plain paper
- Thin card e.g. cereal box card
- Pencil
- Colouring supplies
- Scissors
- Tape or glue
- 2 x elastic bands
- OR, 2 x 20 cm string
- Something round like a cup ...
- to draw around

Thaumatrope *what a funny word!*

They were invented over a hundred years ago, and used to be a very popular toy. When we twist the thaumatrope around very quickly, the two pictures move so fast that our eyes and brain can't see each image individually so instead our brain merges them together making us think that there is only one picture made up of the two pictures put together.



This happens because the light bounces off both sides at very similar times, so it reaches our eyes at similar times. Light from both pictures gets jumbled together in our eyes, which confuses our brain!

This is how cartoons were originally made, by moving lots of different pictures fast enough so that our brains believed they were moving.

TO MAKE A THAUMATROPE...

1. Watch the video of Nanogirl making her thaumatrope to confuse the baddies!
2. Place a cup upside down on a piece of paper and draw around it to make a circle.
3. Do the same thing again to make a second circle which is the same as the first
4. Repeat again but this time on card to give you three circles, two on paper and one on card.
5. Cut out all three circles.
6. Take one paper circle, and draw and colour a picture of your evil supervillain arch-nemesis!
7. Take the other paper circle, and draw some strong prison bars to keep your evil supervillain in jail!
8. Tape or glue the picture of your supervillain onto one side of the card circle.
9. Tape or glue the picture of the prison bars onto the other side of the circle, making sure that the lines are going from top to bottom lined up with the supervillain.
10. Using sharp scissors (an adult might need to help) make a small hole on opposite sides of the circle, as positions 3 and 9 if the circle were a clock.
11. Thread your elastic bands or string through the holes and tie in the middle.
12. Hold one elastic band or string in each hand. Pull it quite tight, but don't stretch the elastic.
13. Use your thumb and first finger to twist the string or elastic bands so that the circle flips around very fast, and watch the picture carefully!



Can you see both pictures at once?

What other pictures could you draw to create a fun double image?

How fast do you have to spin the images to confuse your brain? Try slowing the spinning down and seeing where your brain can still see the two images.

Do you think you could make a whole moving image using this theory?

If you have a flip book you can draw a series of images on each page and flip through the book quickly to make your image look like it's moving!