

Optical Illusions

Estimated Time: 30 minutes

SUMMARY

Everyone loves a good cartoon. How do drawings become animated? Before animators were able to use computers to code movement, illustrators hand created images that used persistence of vision or flicker fusion. Give these optical illusion activities a try and see if you can create a thaumatrope and a Newton Disc!

WHAT YOU'LL LEARN

- Thaumatrope and early animation
- How the eyes and brain work together to form images

Materials Used	Resources Used
<ul style="list-style-type: none"> ● A pencil to write with ● Markers or colored pencils ● Card stock (or printer paper) ● Scissors ● A straw ● Tape or staples ● A pin or thumbtack ● A pencil with an eraser ● A ruler 	<ul style="list-style-type: none"> ● https://www.acmi.net.au/education/online-learning/magic-aardman-education-resources/make-thaumatrope/

THAUMATROPE

1. Thaumatrope toys were invented in the 19th century. They work because our brains interpret multiple images flashing in front of our eyes and connect them to form a continuous stream of motion.
2. Cut one cardstock sheet in half, width-wise.
3. Think of something you would want to draw – a bird in a cage, a fish in a bowl, a face on a pumpkin, or even your own face with a smile or a frown. There are only two images in our thaumatrope so think of something simple.
4. Fold your card stock so it makes a square.
5. Draw one image on one side. Be sure to draw in the middle of each card so the pictures line up. Draw your second image on the other side. For example, you might draw a fish on one side and the fishbowl on the other side.
6. Tape or staple your cardstock to the straw. If you are using bendy straws, use the non-bendy end for your image. The images should face out from the straws on both sides.
7. Optionally, you can tape around the edges to make the thaumatrope stronger.
8. Spin the straw between your hands. If you drew a fish on one side and a bowl on the other, your brain should see the fish in the bowl!

NEWTON'S DISC

9. Although Sir Isaac Newton created a similar diagram to illustrate the primary colors, it is not certain if he actually used this illusion to demonstrate properties of light. It's still a cool illusion where your brain will interpret a multi-colored pie as a gray or off white circle.
10. Cut a circle out of your paper.
11. Using your ruler and pencil, divide your circle into seven even sections
12. Color each section one of the following colors: red, orange, yellow, green, blue, indigo (dark purple), and violet (light purple).
13. Use your thumb tack or pin and fix the circle to the tip of the pencil eraser so that the colorful part of your circle is face up.
14. Place the pencil between your palms and rub so it spins. Watch closely - do you see the colors mixing?

TIPS

- Check out the link in the resources section and try to create a zoetrope - a series of images in sequence.
- Try different patterns on your Newton's disc - what happens when you make polka dots? What if you substitute other colors for the seven colors from Isaac Newton?