

Ames Public Library @HOME Activities

Optical illusions

Optical illusions are images that can be deceptive or misleading to our brains. The information gathered by the eye is processed by the brain creating a perception that in reality, does not match the true image. Optical illusions simply trick the brain into seeing things which may or may not be real. To learn more see a related video on the Library's YouTube Channel at <http://bit.ly/APLvideos>.

Books and Media:

Title	Author / Performer	Call Number
<i>Simple Optical Illusion Experiments with Everyday Materials</i>	DiSpezio, Michael	J 152.14 DIS
<i>Fantastic Optical Illusion</i>	(DK)	J 152.14 FAN
<i>Cool Optical Illusions</i>	Hanson, A, Mann, E	J 152.14 HAN
<i>Picture Puzzler</i>	Westray, Kathleen	J 152.14 WES
<i>Xtreme Illusions</i>	(NG Kids)	J 152.148 XRT
<i>Kitchen Cabinet Science Project</i>	Klepeis, Alicia	J 940.2 KLE
<i>Let's Learn (DVD). S.T.E.M Vol. 2</i>	(Niclelodeon)	J 500 (DVD) STE
<i>Left Brain! Right Brain! STEAM</i>	(Findaway World LLC)	Launchpad Tablet

Websites:

URL	Notes
https://www.optics4kids.org/illusions	Great website that showcases different types of optical illusions

Take Away Kit: Thaumatrope

Bag Contents:

- 1 wooden disc with holes on either side
- yarn
- 1 pencil

To make your thaumatrope you can follow these directions or watch the @Home Activity video on the Library's YouTube Channel at <http://bit.ly/APLvideos>.

To make an effective thaumatrope it's helpful to plan ahead what images you would like on the wooden disc, for instance clear simple images work best, below are some really effective image combinations:

- Bird and Cage; Man and Hat; Duck and Pond; Caterpillar and Leaf; Hand and Heart; Flowers and Vase; Fish and Fishbowl
- Once you have decided on your image combination, using the pencil provided or with drawing implements you have, draw the images on the disc.
- Thread the yarn provided on both sides of the disc.
- Hold the two pieces of yarn and twist the around and around till the yarn is wound tight.
- Pulling on the yarn in and out spin the disc fast.
- When the disc spins very fast the two images will merge together to produce a single image.

What is the science behind the thaumatrope?

The thaumatrope uses the principal of persistence of vision, which is a type of optical illusion. When the disc is spun quickly enough the two images on the disc move faster than our brains can process, so it merges them into one image rather than two separate images. When many still images that are back to back are moved quickly our brain connects them to form a continuous stream of motion as they blend together. You can see this principal at work in traditional cartoons.

Source: Kitchen Cabinet Science by Dr. Michelle Dickson, **J 507.8 DIC**; Ontario Science Center.

Vocabulary

Distort – To twist out of a natural or normal shape.

Optical – Relating to sight especially in relation to the physical action of light.

Illusion – Something that appears real, but is not.

Paradox – Something that seems to be both possible and impossible.

Animation – Is the capturing of sequential, static images – drawings or photos of inanimate objects and playing them in rapid succession to mimic real world motion.

Static – Something that does not move, or change.

Sequential – Relates to anything that occurs in a particular or arranged order.

How do optical illusions work?

An optical illusion is something that appears different from what it actually is. Optical illusions happen when our brain and eyes try to communicate with each other but the interpretation gets a bit mixed-up.

The information that our eyes gather goes a long and complicated journey as it travels to the brain. Some of the confusion associated with optical illusions occurs along that journey, this can happen early or way down the line. For example our brain may mistake what the eye has seen, and think the eyes told it something is moving, but that's not what the eyes meant to say to the brain.

There are many types of optical illusions, and they can make things look darker, wider, bigger, straighter, rounder, higher, or lower.

Source:

Simple Optical Illusion Experiments with Everyday Materials by Michael A. DiSpezio, *J 152.14 DIS*