

How do movies move?



Explore the role of our vision in making movies

Setting: Indoors

Time: < 30 minutes

Concepts: persistence of vision, perception

Skills: planning, observing

Subject(s):

- ✓ Physics
- ✓ Engineering & Technology

Ages:

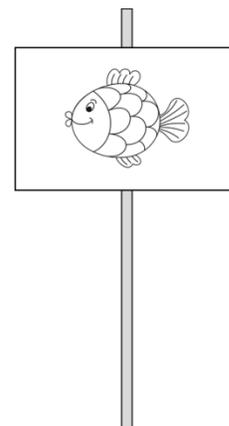
- ✓ 9-11
- ✓ 12-14

Materials:

- Glue or stapler
- Paper strip
- Pencil or marker
- Straw

What to do!

1. Cut paper into a strip approximately 8 x 24 cm.
2. Fold paper in half so it forms a card.
3. On one side, draw a picture of a fish; on the other side, draw a picture of a bowl (decoration can be added).
4. Open the paper and place a straw in the middle of one side so it looks like a popsicle stick (not like a flag).
5. Fold the other side over and glue or staple the straw in place.
6. Hold the straw between the palms of your hand and move back and forth rapidly so that the straw spins. Keep your eyes on the fish and the bowl.



What's happening?

When the straw is rotated rapidly, the fish appears to be inside the bowl. Whenever we see an image, the brain holds onto that image for a short time (1/16 of a second). If another image appears within that time, we will see both images. This is called persistence of vision.

Why does it matter?

Movies and cartoons depend on this phenomenon. If approximately 24 slightly different pictures move in front of the eye each second, they will blend together to make a moving picture. Motion pictures consist of still pictures (frames) that move across a screen at 24 frames per second.



Investigate further!

Try spinning the straw at different speeds. How fast does it have to turn before you can no longer see two separate images?

Videos

- [What is Persistence of Vision? \(Mr. Wizard\)](#) (Video – 5:32 min.)
- [Persistence of Vision \(Veritasium\)](#) (Video – 2:48 min.)