

CURIOSITY AT HOME

CREATING AN AFTERIMAGE



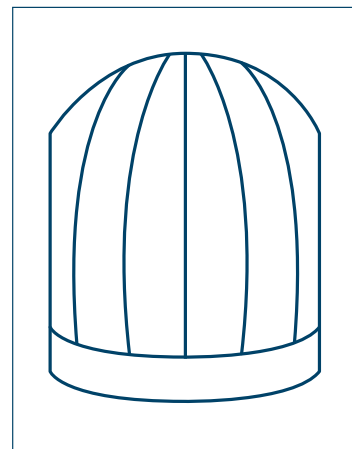
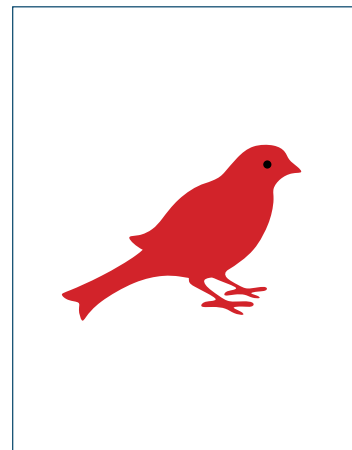
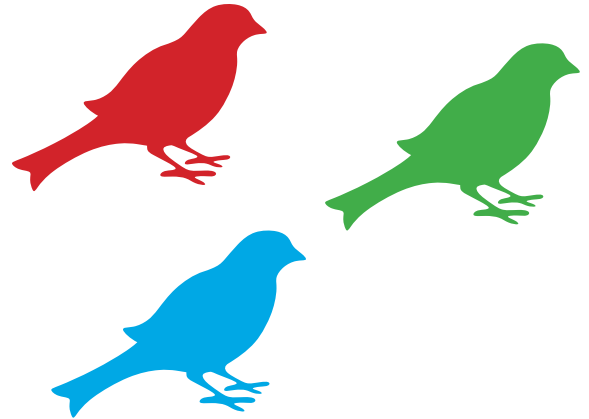
Stare at one color but see another! In this activity, you will recreate a classic optical illusion to explore how and why our eyes create afterimages. An afterimage is anything that you can still see even after the original image is no longer there. Creating afterimages helps demonstrate how our eyes use red, blue, and green light to create all the colors we can see.

MATERIALS

- Bright green, red, and blue construction paper—the brighter the better
- Scissors
- Glue or tape
- Four white sheets of paper, 8.5”x11”
- Black marker or pen
- Science notebook or paper

PROCEDURE

- Cut a bird from each of the three colored papers. The birds should be roughly the same size and shape.
- Glue each shape to the center of its own white piece of paper.
- Draw an eye on each bird with the marker.
- On the fourth piece of paper, draw the outline of a birdcage. Your setup should look similar to the image to the right.
- Place the papers in a well-lit area. Bright lighting is important to make this activity work well.
- Stare at the eye of the red bird for 15 to 20 seconds and then quickly stare at the white paper with the birdcage. You should see a bluish-green bird in the cage.
- Now repeat the process, staring at the green bird. You should see a magenta bird in the cage. Finally, stare at the blue bird. What color bird do you see in the cage? Now that you’ve built your astrolabe, it’s time to learn how to use it. First, you’ll need to find your dominant eye.



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EXPLORE MORE

- Choose one of the birds from the previous experiments. Close your right eye but keep your left eye open, and stare at the bird for 15 seconds.
- After the 15 seconds are up, look over at the cage. Quickly close your left eye, and open your right eye.
- When you look at the white paper with your open right eye, what do you see?
- Open your left eye and close the right. Do you still see the afterimage? Does that mean it's your eye or your brain that produces the afterimage?

WHAT'S HAPPENING?

Cones are the special cells in our eyes that perceive color. Humans have three types of cones named for the color they are most sensitive to and see the best: red, blue, and green. When you stare at a color for too long, those cones get tired out and stop responding to that color as strongly.

White paper reflects red, blue, and green light to your eyes because white light is made up of a combination of all the colors of light. When you suddenly look at the white paper with the birdcage after staring at the red bird, your tired red cones don't react to the reflected red light. Your blue and green cones, however, still respond to the reflected blue and green light, so you see a bluish-green bird as an afterimage. Similarly, when you stare at the green bird, the green-sensitive cones get tired out, and the reflected red and blue light combine to create magenta.



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3–5 GRADE EXPLORATION

- Draw a diagram showing how light moves from a source to the red bird cutout and then bounces off the cutout into your eye. Make sure to include how the color of the light changes as it bounces off the bird.
- Could you do this experiment in a dark room? Why or why not?
- Your body has different ways of gathering information about the world around it. What different senses do you have, and what types of information do they gather?
- Try making birds, fish, or other shapes out of as many different colors of paper as you can, or draw large, bright shapes using colored markers. What color afterimage does each color make? Make a table of your results in your science notebook.

Shape	Color of the shape	Describe the afterimage

- Make or draw some shapes that have two colors instead of one. How does this change the afterimage?
- Using what you've learned about the color of afterimages, create a figure that will make an afterimage of your choice. What colors would you need on your image to create the afterimage you want?



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