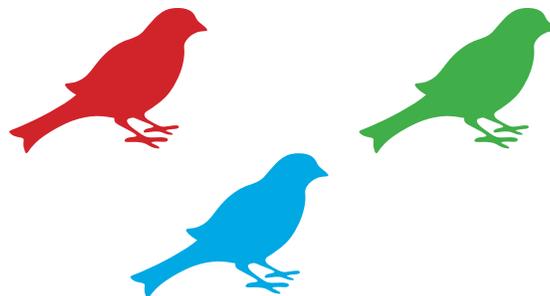


CURIOSITY AT HOME

CREATING AN AFTERIMAGE



Are your eyes completely foolproof? Can you really trust everything they tell you? Our eyes work together with our brains to create a conscious image of the world around us. During this process, raw sensory information from our eyes is changed, deleted, and stitched together by our brains so we can make sense of it. You can experience this sensory processing in action with the following activities.



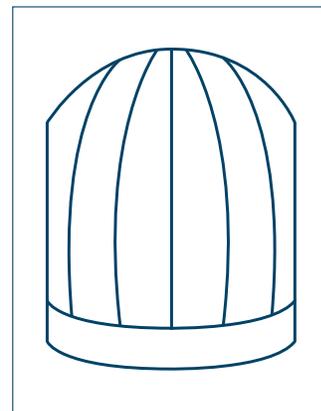
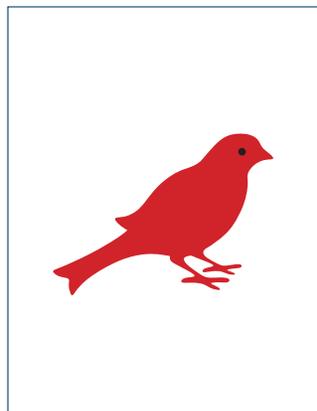
THE BIRD IN THE CAGE ILLUSION

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 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.
- Place the papers in a well-lit area. Bright lighting is important to making 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?



Experiment continued on next page...



Show us how you're being curious! Share your results with us.

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CURIOSITY AT HOME

CREATING AN AFTERIMAGE



DID YOU KNOW

Cones are the special cells in our eyes that receive color. Humans have three types of cones named for the color they are most sensitive too 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. The white paper reflects red, blue, and green light to your eyes because white light is made up of all the colors. 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.

TRY THIS

- If you stare at the bird from closer or farther away, how does that change the afterimage?
- Experiment with different colors beyond red, blue, and green.



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CURIOSITY AT HOME

CREATING AN AFTERIMAGE



6–8 GRADE EXPLORATION

There are two different kinds of afterimages—negative and positive. The *Bird in the Cage Illusion* is a kind of negative afterimage, where you see the inverse (complementary) colors when you look to the white page.

You can create a positive afterimage with a simple experiment.

- Stand in front of a light source like a window, light, or bright computer screen.
- Close your eyes and cover them with your hands for about 30 seconds so that your eyes become adapted to the dark.
- Quickly take your hands away and open your eyes for about half a second to see what's in front of you, then close and cover up your eyes again.
- You should continue to “see” the view in front of you with your eyes covered. Notice that the colors are **not** inverted.



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