

# Mirrors



# Mirrors

**Do you need an idea for a scientific study?  
Try out one of our ideas or make one of your own.**

**Mirrors are devices with a highly reflective surface. Take the following brief quiz to see how much you already know about mirrors. See the bottom of page 4 to check your answers.**

- In what year was glass discovered?
  - 10,000 BC
  - 5,000 BC
  - 2,000 BC
  - 1,000 AD
- Which culture is credited for making the first mirror made of glass with a polished metal backing?
  - Greeks
  - Phoenicians
  - Lebanese
  - Egyptians
- When light shines on a piece of notebook paper, the light is reflected by the paper.
  - true
  - false
- What material is used for the metal backing on most mirrors made today?
  - silver
  - rhodium
  - tin
  - aluminum
- About what percentage of light that strikes a piece of glass is reflected?
  - 4%
  - 20%
  - 56%
  - 73%



## Are You Ready to Spoon?

You can use a shiny spoon to conduct experiments on how different types of mirrors affect the images when they reflect light off their surfaces. So, grab a shiny spoon and get started with your investigation of reflection.

### Materials

1 shiny metal spoon

1 large mirror

### Procedure

1. Make sure the metal spoon is clean and very shiny.
2. Hold the spoon in your right hand and bring the outside of the spoon very close to your face.
3. Observe your reflection and in Table 1 describe what you see.
4. Hold the spoon in your right hand and bring the inside of the spoon very close to your face.
5. Observe your reflection and in Table 1 describe what you see.
6. Hold the spoon in your right hand with your right arm crossed across your chest. Stand in front of a large mirror and in Table 1 describe your reflection.

**Table 1. Observations**

Experiment	Observations
Outside of spoon close to face	
Inside of spoon close to face	
Standing in front of large mirror	

### Questions

1. Which side of the spoon produced an enlarged image of your face?
2. Which side of the spoon produced a reduced image of your face?
3. What did you notice about the size of your image when you stood in front of the large mirror?
4. Was the right or left hand of your image holding the spoon when you stood in front of the large mirror with your right arm across your chest? Propose a reason for your response.

# Mirrors

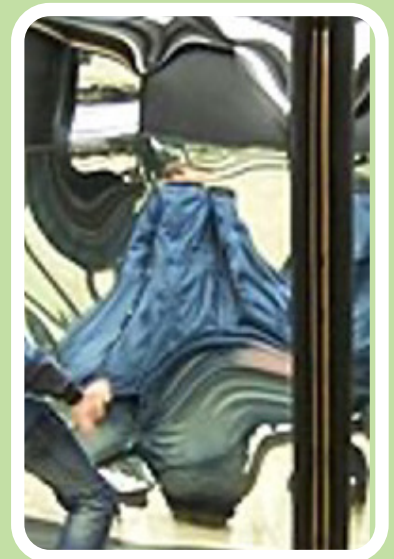
## Mirrors

For as long as people have been on Earth, many have been fascinated by seeing their appearance in a reflection. In fact, in Greek mythology Narcissus supposedly become so enamored with his reflection in a pool of water that he fell in love with himself and was unable to leave his reflection. He eventually turned into a gold and white flower that often is found near pools of water.



A medium's refractive index is inversely proportional to the wavelength of the light. So red light that has a longer wavelength than blue light has a refractive index in a medium that is smaller than the blue light. This means that blue light travels slower through the medium than red light and is bent at a greater angle as it moves through the medium.

Water has a different refractive index than air. When the white light from the sun moving through air strikes a droplet of water the speed of the light slows down. This causes the light rays to change directions and bend according to their colors. The slower moving wavelengths bend to a greater degree than the faster moving colors. This separates the white light into the various colors of the rainbow. So, the next time you see a rainbow in the sky, think of refractive indexes, wavelengths of light, and colors. Or, just enjoy this beautiful work of nature.



Please visit our site for more helpful information:  
[STEMsims.com](http://STEMsims.com)

**Answers:** Page 2 Answers: 1) b, 2) c, 3) a, 4) d, 5) a. Page 3 Answers: Are You Ready to Spoon? 1) The concave (inside) side of the spoon. 2) The convex (outside) side of the spoon. 3) The image was the same size as the original object (you). 4) The image was reversed, the right side of you hold- ing the spoon is the left side of the image.

© 2022 STEM Sims. All rights reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable, and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent or other industrial or intellectual property rights.