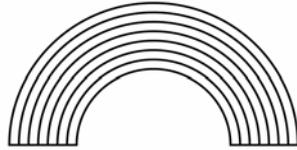


## RAINBOWS



Humans have always been fascinated by rainbows. In Greek mythology, they were said to be the path of Iris, the messenger of the gods. In Norse mythology, a rainbow was a Bifröst bridge, connecting the homes of the gods and humans. Irish leprechauns are said to hide their gold at the end of a rainbow. Those are magical stories, but they are not true. What is a rainbow, really?

A rainbow is an arc of colored light in the sky. It is caused by sunlight refracting and reflecting from droplets of water, such as rain or mist, in the air. The colors of the reflected arc of light are always in the same order: red, orange, yellow, green, blue, indigo and violet.

How does sunlight create a rainbow? Light enters a drop of water. The drop acts as a prism, and *refracts* the light. This means the light is broken up into the individual colors, or spectrum, that are contained in the light. If the light enters the drop at just the right angle (about 42 degrees), the back of the drop acts as a mirror and reflects most of the light back out the front. Have you ever seen a double rainbow? They are caused when the droplets reflect the light *twice*. The colors in the spectrum of the second rainbow are in the opposite order from those in the first.

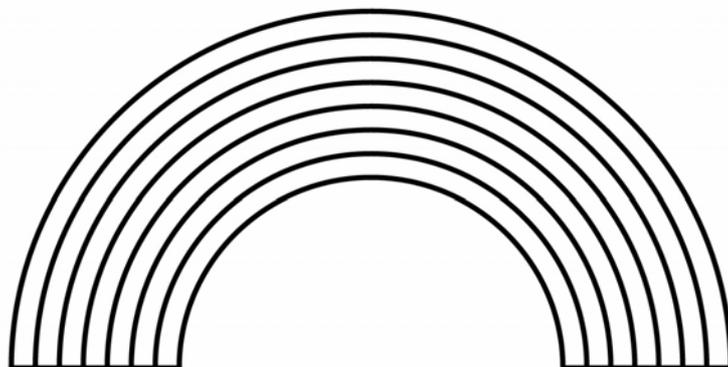
Why is a rainbow arc-shaped? This is due to the angle between the sun, the droplet and the viewer. The viewer sees only one color of light, for example red, reflected from a certain droplet. Droplets a slight distance away are at a slightly different angle, and so the viewer sees only the orange light reflected, and so on through the spectrum. A rainbow is actually circular, which can be seen if viewed from above, such as from an airplane. Usually, however, half of the circle is below the horizon when seen from below, giving it the appearance of an arc.

Rainbows are not only caused by raindrops. They can also be seen in mist, such as that created by waterfalls. You can even make them yourself, by spraying water into the air on a sunny day!

Name \_\_\_\_\_ Date \_\_\_\_\_

## ANSWER THE QUESTIONS ABOUT *RAINBOWS*

1. What did Norse mythology consider rainbows to be?
  - a. the passenger of a messenger
  - b. a bridge between gods and humans
  - c. a meteorological phenomenon
  - d. refracted sunlight
  
2. What causes rainbows?
  - a. water droplets refracting and reflecting sunlight
  - b. leprechauns
  - c. arcs of sunlight
  - d. airplanes
  
3. What is the shape of a rainbow seen from above?
  - a. oval
  - b. arc-shaped
  - c. circular
  - d. a nearly straight line
  
4. How can you make a rainbow yourself?
  - a. shine a light on raindrops
  - b. spray water into the air on a sunny day
  - c. fly an airplane over water
  - d. it is impossible to make a rainbow
  
5. Color the rainbow in the correct color order.



**Answers to *RAINBOWS***

1. b
2. a
3. c
4. b