



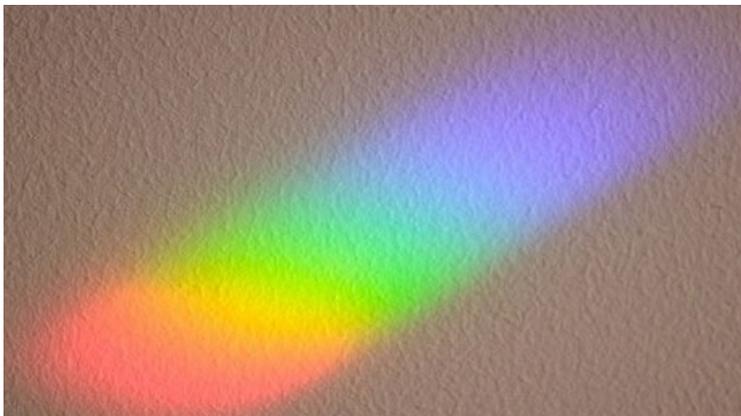
# 4-H AT HOME



FUN, HANDS-ON ACTIVITIES TO KEEP KIDS ENGAGED

## RAINBOWS

A rainbow is a multicolored arc in the sky which appears when sunlight hits water droplets. These optical illusions are created by the refraction and reflection of light. The best time to see a rainbow is when it's sunny and raining. Morning and evening when the sun is at a lower angle makes the occurrence of a rainbow more likely.



### Rainbow on the Wall

#### Supplies Needed:

Clear Glass or Jar	Water
Small Mirror	Sunlight

#### Procedure:

1. Fill the glass/jar with water
2. Put the mirror into the water inside the glass/jar at an angle
3. Position the glass so the sunlight shines directly at the mirror. You may need to adjust the mirror to find the right angle
4. Look for the reflection on the wall. It would be easier to see if the room is dark.
5. Adjust the angle of the mirror until you see a rainbow on the wall.

### FUN FACTS

No two people see the same rainbow because your eyes and someone else's cannot be in the exact same place. So we all see slightly different rainbows.

A rainbow doesn't actually exist, they are optical illusions, so you can't touch it. Unfortunately, there is no pot of gold at the end either.



OSU EXTENSION  
**GRADY COUNTY  
4-H YOUTH DEVELOPMENT**

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## MORE TO EXPLORE

A "double rainbow" is where a second, much fainter rainbow can be seen. This is caused by the light reflecting twice inside the water droplets. The colors of the second arc are inverted with violet on the outer edge and red on the inner edge.

## Colors of the Rainbow

Although some people may see more colors in a rainbow, the visible spectrum is made up of 7 colors as identified by Sir Isaac Newton. You can remember them with the name Roy G. Biv.

Red Orange Yellow  
Green  
Blue Indigo Violet



## Walking Rainbow

**Supplies:** 7 wide cups/ jars, Water, 6 paper towels, Red, Yellow & Blue Food Coloring

- Procedure:**
1. Fill 3 jars with water almost to the brim
  2. Put 2 to 5 drops of food color in each jar with water
  3. Line the jars up alternating empty and full jars. Empty jars should be on both ends
  4. Fold paper towels in half lengthwise twice to make a long strip.
  5. Put one end of a paper towel strip into the first empty jar and the other end into the full jar next to it. Submerge the paper towel as much as possible.
  6. Repeat until each jar has two paper towels in it, connecting it to the jars on either side.
  7. Watch and wait. This experiment may take several hours to over night.

Watch a video on this experiment from an 4-H State Leadership Council member

<https://youtu.be/uUOgihL5exI>

## HOW DOES IT WORK? WHY IS IT IMPORTANT?

The same process that gets water from the roots of trees to leaves will power this experiment. Paper towels, and the plants they are made of, consist of a sugar compound called **cellulose**. Cellulose can resist gravity and pull water upwards through a process called **capillary action**. When water molecules cling to a different substance — in this case, the paper towels — the process is called **adhesion**. However, when water molecules cling to each other, the process is called **cohesion**. Capillary action occurs when adhesion is stronger than cohesion. In this experiment, you will see the effects of adhesion overpowering cohesion when the water molecules become attracted to the paper towels' cellulose structure. When this occurs, the water and the added food dye, travel up the paper towels. Once the paper towels cannot hold any more water, and adhesion is no longer stronger than cohesion, gravity takes over and releases the accumulated water into the empty jars. The colors mix in the discard jars to make a rainbow.