



# STEM Challenge:

## Colors and Rainbows

A “primary color” refers to those colors that can be combined in different amounts to make other colors. White light is made up of seven colors, including the primary colors, red, green, and blue. The primary colors of pigments, such as paint, are a little different--red, blue, and yellow.



A rainbow is caused by sunlight and atmospheric conditions. Light enters a water droplet, slowing down and bending as it goes from air to denser water. The light reflects off the inside of the droplet, separating into its component wavelengths--or colors. When light exits the droplet, it makes a rainbow. Rainbows caused by sunlight always appear in the section of sky directly opposite the sun.

This time we have two challenges for you to try at home:

Mixing Colors

How to Catch a Rainbow.

Both are easy ways to play with light and color in the comfort of your home.

Let us know how you did at [eplyouthservice@gmail.com](mailto:eplyouthservice@gmail.com)!



# Mixing Your Own Colors

## What you need:

Water

3 large cups

Food coloring

Straws, eye dropper, or pipette

6 small cups, a Styrofoam egg carton, or something similar

## What to do:

1. Fill each of the 3 large cups with water. Use food coloring to tint one red, one blue, and one yellow.
2. Use a straw, eye dropper, or pipette to transfer from the larger cups into the smaller cups for mixing.

## Try these experiments:

- \* What happens if you add a couple of drops of blue to a couple of drops of yellow?
- \* Try adding more blue. What happens? Repeat with other sets of two colors, such as yellow and red or red and blue.
- \* What happens if you mix a primary color (red, yellow, blue) with a secondary color (purple, green, orange)?

**Take it further and make a chart to show which colors make new colors when mixed!**

# How to Catch a Rainbow

## What you need:

Water

Clear glass jar or cup

Sunny day or light source, such as a flashlight

White paper

## What to do:

1. Fill the cup up with water.
2. Find a sunny spot outside.
3. Find the “perfect” spot, so that the sun shines through the water onto the paper to make a rainbow.

## Try these experiments:

- \* Try adding salt or sugar to the water. Can you still make a rainbow?
- \* Try shining a flashlight through the water; what happens? Can you create a rainbow?
- \* What are other ways you can create rainbows?