

Activity Instructions

The following items will be needed for this activity:

- *Student Handout One* (activity instructions)
- *Student Handout Two* (activity worksheet)
- plastic sandwich container full of sugar
- food colouring
- colour-coded measuring spoons (1 tbsp and 1/2 tsp)
- clear, tall container with flat bottom
- liquid measuring cup
- funnel
- wide diameter straw
- spoon
- 6 glasses
- water

Divide students into six groups. Each group will make a different colour (Steps 1-6).

Detailed instructions for students can be found in the Student Handout, under Student Handout One.

Step 1 - Purple

In the first glass, add 1/2 tbsp of sugar, one drop of blue food colouring and one drop of red food colouring. Add 1 cup of water. Using a spoon, stir until all of the sugar has dissolved (**Figure 1**).

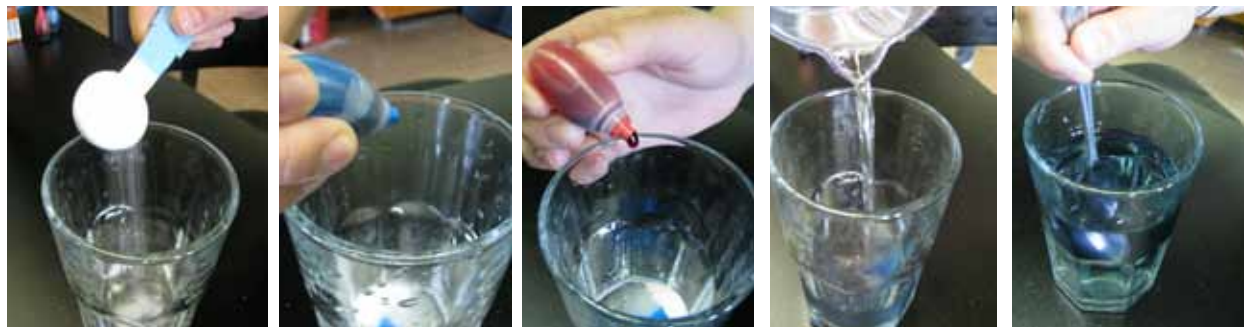


Figure 1

Rainbow in a Bottle - Activity Instructions

Step 2 - Blue

In the second glass, add 1 tbsp of sugar and six drops of blue food colouring. Add 1 cup of water. Using a spoon, stir until all of the sugar has dissolved (**Figure 2**).

Step 3 - Green

In the third glass, add 1.5 tbsp of sugar and six drops of green food colouring. Add 1 cup of water. Using a spoon, stir until all of the sugar has dissolved (**Figure 2**).

Step 4 - Yellow

In the fourth glass, add 2 tbsp of sugar and six drops of yellow food colouring. Add 1 cup of water. Using a spoon, stir until all of the sugar has dissolved (**Figure 2**).

Step 5 - Orange

In the fifth glass, add 2.5 tbsp of sugar, three drops of red food colouring and three drops of yellow food colouring. Add 1 cup of water. Using a spoon, stir until all of the sugar has dissolved (**Figure 2**).

Step 6 - Red

In the sixth glass, add 3 tbsp of sugar and six drops of red food colouring. Add 1 cup of water. Using a spoon, stir until all of the sugar has dissolved (**Figure 2**).



Figure 2



Figure 3

Step 7

Rest the straw diagonally against the bottom of the container and attach the funnel to the neck of the straw (**Figure 3**). It is very important to keep the straw in contact with the bottom of the container as the rainbow is poured.

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Step 8

Ask one representative from the group of students who made the least dense sugar solution (purple) to pour the mixture slowly down the funnel into the container. If pouring directly from the glass proves difficult, transfer the solution to the spouted measuring cup and pour. Fill to the first line marked on the container. Ask a student from the next group to add the blue solution slowly through the funnel, ensuring that the straw remains in contact with the bottom of the container. Fill to the second line. Ask the remaining groups to add, in the following order, the green, yellow, orange and red solutions, filling to each subsequent line in order to make the rainbow (**Figure 4**). Do not remove the straw.



Figure 4

Step 9

The straw must be removed from the container very carefully because it is full of red sugar solution. This solution will mix into the other colours and ruin the layered rainbow effect if it is simply pulled from the glass.

To remove the straw, place an empty glass next to the container. Cover the top of the straw with the index finger or thumb and hold it upright, while keeping the bottom of the straw in contact with the bottom of the container. Ensure that there is a tight seal between the thumb or index finger and the straw, and slowly lift the straw in a straight line out of the container (**Figure 5**). Be sure to keep the straw straight. Once the straw has been removed from the rainbow, quickly drain it into the empty glass.

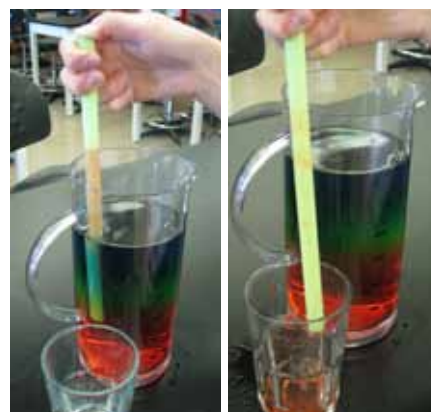


Figure 5

Step 10

Once the straw has been removed, a rainbow consisting of distinct, coloured layers should be clearly apparent. The stacked colours are best viewed when the container is placed in front of a white background or a sunny window (**Figure 6**).



Figure 6