



MINI WALKING RAINBOW EXPERIMENTS

MATERIALS:

| | |
|-------------------|------------------------------------|
| Water | 8 Rectangle Pieces of Paper Towels |
| 6 Mini Clear Cups | 3 Zip Bags of Food Coloring |
| 1 Paper Clip | 1 Arched Piece of Paper Towel |
| Washable Markers | Shallow Bowl |

VOCABULARY:

| | | |
|------------------|----------------|------------------|
| Color Wheel | Primary Colors | Secondary Colors |
| Capillary Action | Gravity | Solid |
| Matter | Molecules | Surface |
| Tension | Force | Liquid |
| Gas | | |

WALKING RAINBOW DIRECTIONS:

1. Fill the 6 cups with water. Fill 3 of them 3/4 full and fill 3 of them 1/2 full.
2. Dye one of the 3/4 full cups yellow, one 3/4 cup blue and one 3/4 cup red. It is important that you dye the cups with more water for this experiment to work.
3. Arrange the cups in a circle in the following order: red, clear, yellow, clear, blue, clear.
4. Get 6 of the rectangular pieces of paper towel from the supply bag.
5. Dip one end of a paper towel into the red water and put the other end in the clear cup next to it.
6. Dip one end of a paper towel into the clear cup and put the other end in the yellow cup next to it.
7. Dip one end of a paper towel into the yellow cup and put the other end in the clear cup next to it.
8. Dip one end of a roller towel in the clear cup and put the other end in the blue cup next to it.
9. Dip one end of a paper towel into the blue water and put the other end in the clear cup next to it.
10. Dip one end of a paper towel into the clear cup and put the other end in the red cup next to it.
11. Let the project stand for at least 10 minutes.
12. You will see the color creep up through the paper towels and into the clear cups. The primary colors will mix and form secondary colors in the clear cups.



THE STEAM BEHIND THE EXPERIMENT:

When the paper towels are placed between two cups, they exemplify capillary action, which is how liquid can move up something, rather than follow the usual pull of gravity and pull down. To get a bit technical, intermolecular forces between the liquid and the paper towel create surface tension that reacts with the adhesive force between the liquid and paper towel. This causes the water to move up the paper towel and into the next jar. Capillary action is how plants pull water from the soil and up into their leaves to keep watered. Then, once the paper towels pull color from the base red, blue, and yellow primary color cups, the resulting mixture creates the secondary colors of green, purple, and orange, completing the rainbow. Water moves from cup to cup due to capillary action and surface tension. The surface tension of the water keeps the water from falling off the paper towel onto the table below as it creeps up the paper towel. Capillary action is the force that is applied to the molecules in the water as they are absorbed by the towel. The pressure gently pushes the water all the way through the towel, and down into the cup next to it. The water stabilizes and ends up at the same level in all the cups because of how things like to stabilize. Once the water level is the same in all the cups and the paper towels are all wet, the water stops moving from cup to cup. This is how the colors remain in primary in secondary colors, rather than continuously traveling from cup to cup, which would make all the cups turn brown.

MAKE IT AWESOME:

Try using larger cups and see what happens.

EXTENSIONS:

1. What happens when you use different amounts of food coloring?
2. What happens if you change the order of the cups?
3. What other changes can you come up with for this experiment

GROW A RAINBOW – VERSION 1:

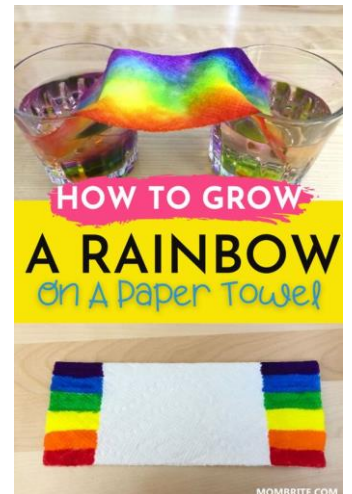
1. Fill a bowl halfway with water.
2. Color the ends of the arched paper towel with washable markers in rainbow order. See the picture for guidance.
3. Tie the string to the paper clip.
4. Clip the paper clip to the top of the paper towel rainbow.
5. Hold the rainbow over the bowl of water until the ends get dipped into the water.
6. Watch what happens as the paper towel absorbs water.

GROW A RAINBOW – VERSION 2:

1. Color the ends of 1 of the rectangular pieces of paper towel in rainbow order. Use the picture as a guide.
2. Fill 2 of the small clear cups with water.
3. Lay the ends of the rainbow paper towel in the cups of water.
4. Watch what happens as the paper towel absorbs the water.
5. Use the last piece of paper towel to create whatever design you wish with whatever colors you wish!



grow a rainbow
EXPERIMENT



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