

Rainbow from Black

Determine what colors are used to create black inks.

What you need:

White round coffee filter
Water soluble black ink marker
9 to 12 oz cup filled with a 1/2 inch of water
Clothespin or tape
Popsicle stick or pencil

What to do

1. Draw a large circle or square with a black marker in the ruffled area of a coffee filter. Just be sure there are no marks in the center of the coffee filter.
2. Fold the coffee filter in half, and fold it in half again.
3. Lower the coffee filter into the cup of water with the tip pointing down. Only a small part, of the filter tip, will be in the water. The black ink should not touch the water.
4. To hold the filter in place, put the pencil or Popsicle stick across the top of the cup and clip or tape the filter so that it stays in place.
5. Observe as the water rises up the filter.

What to ask

- What happens to the ink as the water rises up the paper?
- Which color travels the farthest?
- Why do you think it traveled the farthest?

Did you know?

Many inks aren't really the color they appear. Each color contains several different colors. One way of separating out parts of a solution is called **chromatography**. In this case, the water in the cup slowly rises up the coffee filter. The ink is soluble in water, which means that water can pick up the ink. Each of the colors in the ink has a different weight. The water carries the inks different distances depending on the weight of each ink. As the distances become farther and farther apart, you can see the different colors separating to create a rainbow effect.

What's next?

- Try this activity again with a different colored marker or a different marker brand. Compare the new and old coffee filters. What do you notice about the colors on the coffee filter?



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