

Secret messages

Materials:

- water (1/2 cup)
- baking soda (1 Tablespoon)
- paper
- q-tips (or a paintbrush) to apply invisible ink
- rubbing alcohol (1/2 cup)
- turmeric (1 teaspoon)
- paper towels (or a paintbrush) to apply color-changing solution

Supplies:

- measuring cup
- measuring spoons
- spoon for stirring

Instructions:

1. Add 1 Tablespoon of baking soda to 1/2 cup of water.
2. Stir the baking soda into the water to make the “invisible ink”.
3. Use q-tips (or paintbrushes) to draw a picture with the invisible ink on paper.
4. While you are waiting for your paper to dry, mix up your color changing-solution. First, add 1 teaspoon of turmeric to 1/2 cup of rubbing alcohol.
5. Stir the turmeric into the rubbing alcohol. (Note: The solution can stain a little bit. I used a white plastic bowl, which was not the smartest, because it was a little difficult to clean afterwards. You might want to use a glass bowl.)
6. After the paper is dry, use a paper towel (or paintbrush) to apply the color changing solution to the paper to reveal the secret message! (Note: We used paper towels, but our hands were all a little orange for a few hours afterwards, so you might want to use a paintbrush instead!)

Turmeric is a pH indicator. This means that it will change the color of different substances when it interacts with them to show its pH. pH tells us the acidity or basicity of items. Basically, substances go through a chemical reaction when they “meet” a pH indicator and that causes them to change color.

Think about a traditional baking soda and vinegar experiment - they combine and erupt! That is because baking soda is a base and vinegar is an acid. If we tested the pH of vinegar it would be a very different color than the pH of baking soda.

When you paint over the baking soda papers with turmeric, we are seeing that deep purple appear because that is the color that baking soda changes when it interacts with a pH indicator.

Information from: <https://childrens-museum.org/blog/2020/04/science-magic-invisible-ink>