

Invisible Ink

Action

A message, written in lemon juice, on paper will be revealed when painted over with iodine.

Grade Level

Grade 3 - Properties of Matter

Grade 5 - Matter and Its Changes

Materials

- Tincture of iodine
- Water
- 2 bowls (1 for lemon juice and 1 for iodine and water)
- Lemon juice
- Paint brushes
- White paper

Instructions

- Pour some lemon juice in one bowl. In the other bowl, pour some water and mix with it a small amount of iodine.
- Using the lemon juice as "ink", write a message on the paper. Once the message is complete, thoroughly rinse the paintbrush. Allow the lemon juice to fully dry.
- Once the paper is completely dry, paint over the entire paper with a thin layer of the water and iodine solution. Do not use too much water and iodine solution, just enough to cover the page. Allow the paper to dry and after approximately 5 minutes, the lemon juice message should be revealed in white.

Safety

Iodine is a poisonous substance. If children are performing this experiment, they must be strongly cautioned to keep their hands away from their eyes. Safety glasses could be considered. Use caution when using blow dryers or other electrical devices around containers of water.

Hints

- A blow dryer or fan may be used to help the message dry more quickly.
- The message will show up best when the iodine is dry so be patient.
- Standard white paper works the best. Heavier paper (such as construction paper) does not work as well.

Science Principle

Paper contains starch, which turns purple when it reacts with iodine. Iodine is often used to measure the starch content of substances. Note that there is a colour change of the iodine from the initial red to purple. This is indicative of the presence of the starch in the paper. Lemon juice stops the colour change so the areas where the message has been written remain white.