

# BOOMbox at Home

## Invisible Ink

Invisible ink is a great way to keep messages hidden. Unless someone knows that invisible ink was used, they'll have no idea that the message even exists! Did you know that there are several types of invisible ink? Learn about a few of the options and how they work with this guide. Then, apply your knowledge by writing or revealing your own secret messages!



## Chemical Reaction

### Supplies

- paper
- water
- baking soda
- paint brush
- dark colored juice, like grape or cranberry
- sponge or cotton swabs

### Instructions

- Mix equal amounts of baking soda and water.
- Use a paintbrush to paint your message on the paper with the mixture. Let the paper dry completely.
- To read the message, use a cotton swab or sponge to wipe the juice across the page. The message will reappear!

### Explanation

The dark colored juice contains pigments that act as pH indicators. Because baking soda is a base, or a substance with a high pH, it reacts with the pigments in the juice to change the color of the writing.

*This is a self-destructing message! Because all of the liquid damages the paper, you may not be able to read this message more than once.*

# Heat Reveal

## Supplies

- paper
- lemon juice, milk, or baking soda solution
- paint brush
- light bulb or other heat source

## Instructions

- Use a paintbrush to paint your message on the page with the lemon juice, milk, or baking soda solution. Let the paper dry completely.
- To read the message, hold the paper over a heat source, like a lightbulb. As the paper gradually heats up, the message will be revealed!

*Careful! Make sure your heat source isn't strong enough to catch the paper on fire.*

## Explanation

The liquids (lemon juice, milk, or baking soda solution) aren't visible when they dry, but they do slightly damage the structure of the paper. This isn't noticeable at a glance, but when the paper is heated, the damaged areas are the first to start burning. As the message is slightly charred, it becomes more visible. This method works with many different liquids (even urine). Try out different liquids to see what else works.

# Wax Resist

## Supplies

- white paper
- a white crayon
- paint brush
- watercolor paint

## Instructions

- Write your message on the paper using the white crayon.
- To read the message, paint over the crayon with watercolor paint. The message will remain white while the surrounding paper takes on the color of the paint.

## Explanation

The wax of the crayon creates a physical barrier that protects the paper underneath from the paint. You may have used a similar technique in your own art projects. In fact, even professional artists use a supply called masking fluid that works using the same principle.

# Texture

## Supplies

- paper
- salt
- water
- paint brush
- pencil

## Instructions

- Make a saturated saltwater solution by dissolving as much salt as you can in some hot water. If the water you're using is very hot, you may want to ask an adult for help.
- Use the paintbrush to paint your message on the paper with the saltwater solution. Let the paper fully dry.

## Explanation

As the solution dries on the paper, it forms tiny salt crystals. The crystals are hard to see at a glance, but they have a more rough texture than the rest of the paper. This texture picks up more graphite from the pencil lead, making the message darker. Try touching the message before revealing it. Can you feel the texture difference? This option may be easier for someone to detect than the other types of invisible ink, but it also uses the most readily available materials.

*What will you learn today?*

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