

# JR-SCIENTISTS

# INVISIBLE INK

Did you know you can write secret messages with just lemon juice?  
Let's try it!

## INSTRUCTIONS:

**STEP 1:** Cut a lemon or pour juice into a small bowl.

**STEP 2:** Using your paintbrush, paint a secret message onto your paper.

**STEP 3:** Let your message dry.

**STEP 4:** With adult help or supervision, press your hot iron onto the paper where your message is. Hold for 15 seconds and lift to reveal the secret!

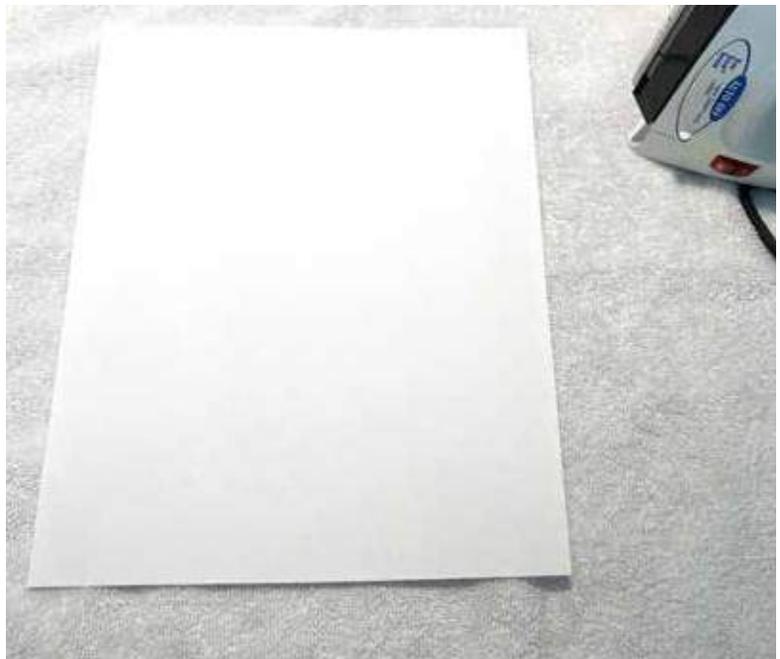
## THE SCIENCE

Lemons are made of organic material. Organic material is made from carbon compounds. The juice is colorless when it's at room temperature, but when you heat the juice with the iron, the carbon compounds break down, releasing the carbon. The carbon then reacts to oxygen in the air (oxidation) which makes the lemon juice turn a darker color.

These special 'invisible ink' messages were even used to communicate in World War 1!

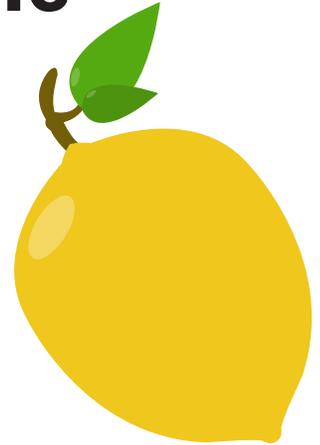
## SUPPLIES

Lemon juice  
Iron  
Paintbrush  
Paper  
Small bowl  
Towel



# Invisible Ink Observations

Use this worksheet to process and evaluate your work.



How does the paper look after you have written on it?

Can you see your message?

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What happens when you apply heat to the paper? Why does this happen?

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Can you still see the message when the paper is dry?

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Try lime juice, orange juice, milk or vinegar. Did they work as well?

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