



Princeton & NYU Discoveries in Action

Do science from home: Invisible Ink!



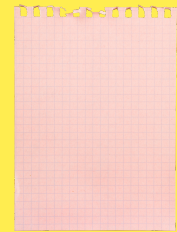
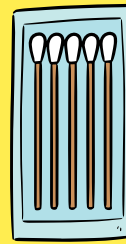
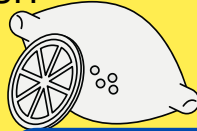
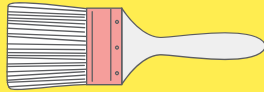
Begin doing science by introducing new concept:



Lemon juice is made up of 90% water with some molecules like citric acid, sugar and carbon compounds. These carbon molecules are invisible at room temperature. When you write a message with lemon juice the water dries, evaporating into the air. What's left behind are the sugar, acid, and carbon. When these things are heated, they begin to interact with the oxygen in the air in a process called oxidation which turns the carbon compounds to a brown. So when you heat up paper with dried lemon juice on it the what was an invisible message becomes visible!

Equipment:

- 1 lemon
- Small container (jar, bowl, glass etc.)
- Cotton swab or paintbrush
- Paper
- Candle



Methods:

- 1 Squeeze the lemon in your dish (tip: it is okay to have seeds!)
- 2 Draw a picture or write a note using the cotton swabs on a piece of paper and leave to dry.
- 3 **Adults:** Light your candle!
- 4 **Adults:** Heat the paper evenly making sure not to put the flame too close or keep the paper in one spot for too long.

Results & Discussion

- ★ An important part of doing science is discussing why we think things happen ★
- What did you observe?
 - Can you see your words/pictures?
 - How long did it take for your words/ picture to appear?
 - What do you see/ smell/ hear?
 - What caused the ink to turn brown?

