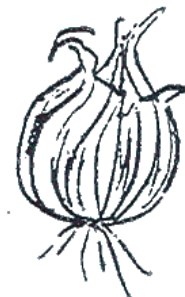


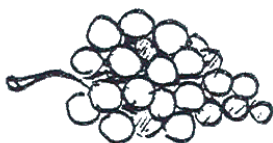
TEACHER MATERIALS – Ink

CONCEPT: Math, Science, and Technology
-Standard 3.5- Measurement
-Standard 4.1- Living Environment
-Standard 4.3- Physical Setting
Career Development
-Standard 3a.1- Basic Skills
-Standard 3a.2- Thinking Skills

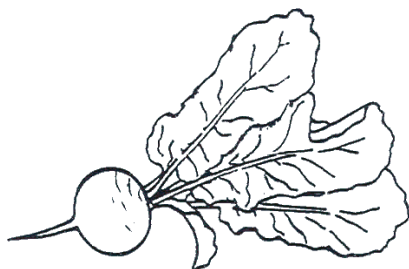


OBJECTIVES: The students will make ink from two common food items.

BACKGROUND: Today's inks are somewhat complex: instant drying, non-blotting, non-fading, and non-skipping. These are recent changes. In the past, inks were often made at home using common foodstuffs. This lesson shows one example of this and a second fun example with "invisible ink." Ink is a pigmented liquid or paste used to write.



ACTIVITIES: 1. Have the students make "Ink from Beets.*"
2. Have the students make "Invisible Ink."



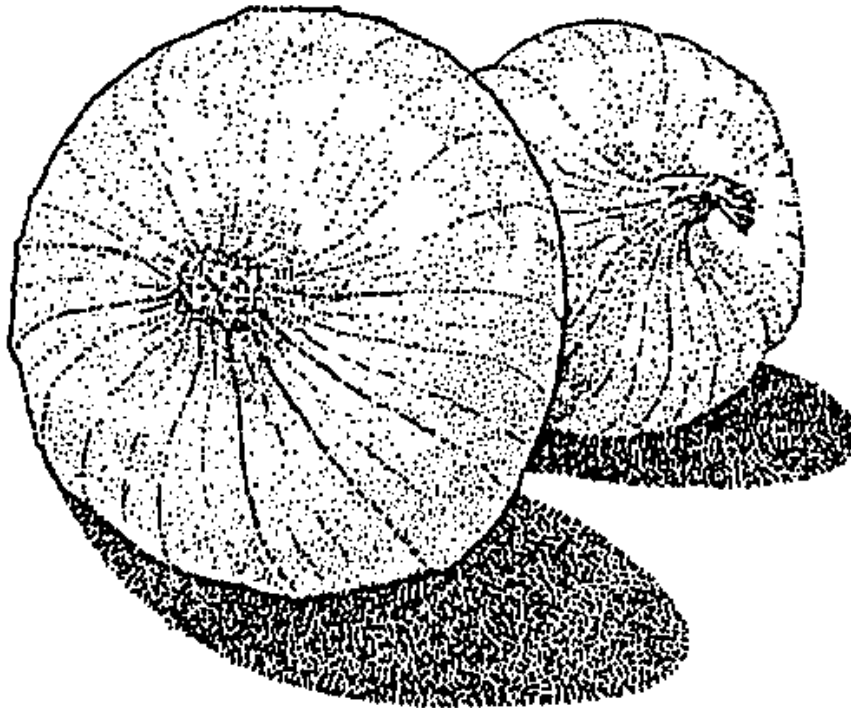
* or other fruits (purple grape juice, blackberry juice).

Information - Invisible Ink

Undetectable messages have been sent for hundreds of years. In fact, on November 29, 1776, The Committee of Secret Correspondence first used invisible ink to send a secret message during the American Revolution. The method and perhaps ink they used was much like that in this lesson. Many common kitchen products can be used for this lesson. Citrus juice, vinegar or even sugar and water (1 teaspoon sugar per 8 ounces of water) can make such “invisible inks.”

Why does the message appear with the addition of heat? Carbohydrates contain (as one of their main components) carbon. The heat causes the component parts of the onion (in the lesson) to break down – releasing the carbon in the fluid.

If the students have difficulty writing with toothpicks, they could also use paint brushes or small nails.



Invisible Ink from Onions

MATERIALS: large onion 1/4 cup water
paper cup/small dish spoon
knife toothpicks/pens with nibs
candle and candle holder (or light with light bulbs) blender
strainer

ACTIVITIES: Have the students:

1. Remove the onion skin.
2. Cut the onion in half and puree in blender
3. Strain out juice into paper cup/small bowl
4. Add a few drops of water
5. Stir
6. Dip toothpicks or nibs into ink and write.
7. Allow to dry.
8. Hold writing over candle or hot light bulb.
9. Message will appear.

BE CAREFUL NOT TO HOLD THE PAPER TOO CLOSE -- THE PAPER WILL BURN!

Ink From Beets*

MATERIALS: 1/4 cup beet juice white glue
water paper cup/shallow dish
spoon toothpicks, pen with nibs, or nails

ACTIVITIES: Have the students:

1. Mix a few drops of white glue with the water in a cup or shallow dish.
2. Add the beet juice and stir.
3. Dip toothpicks or pen with nibs into ink and write.

* or other fruits (purple grape juice, blackberry juice).