

## Small-Scale LAB

### 1 + 2 + 3 = Black!

#### Purpose

To make macroscopic observations of chemical reactions and use them to solve problems.

#### Materials

- paper
- metric ruler
- reaction surface
- materials shown in grid
- pipette, medicine droppers, and spatulas

#### Procedure

1. Draw two copies of the grid on separate sheets of paper. Make each square in the grid 2 cm on each side.
2. Place a reaction surface over one of the grids. Use the second grid as a data table to record your observations.
3. Use the column and row labels to determine which materials belong in each square. Depending on the material, add one drop, one piece, or a few grains.
4. Stir each mixture by forcing air from an empty pipette as directed by your teacher.

	NaClO	H <sub>2</sub> O <sub>2</sub>	CuSO <sub>4</sub>
KI			
KI + Starch	FOR REFERENCE ONLY		
KI + Paper			
KI + Cereal			



#### Analyze and Conclude

Using your experimental data, record the answers to the following questions below your data table.

1. What color is a mixture of sodium hypochlorite (NaClO) and potassium iodide (KI)?
2. What happens when you mix NaClO, KI, and starch?
3. What do NaClO, H<sub>2</sub>O<sub>2</sub>, and CuSO<sub>4</sub> have in common?
4. What substance is found in both paper and cereal? How do you know?
5. If you used NaClO instead of CuSO<sub>4</sub> in reactions other than the reaction with KI and starch, would you expect the results to always be identical? Explain your answer.

#### You're The Chemist

The following small-scale activities allow you to develop your own procedures and analyze the results.

1. **Design It!** Design and carry out an experiment to see which foods contain starch.
2. **Design It!** Read the label on a package of iodized salt. How much KI does iodized salt contain? Design an experiment to demonstrate the presence of KI in iodized salt and its absence in salt that is not iodized.
3. **Design It!** Antacid tablets often contain starch as a binder to hold the ingredients in the tablet together. Design and carry out an experiment to explore various antacid tablets to see if they contain starch.
4. **Analyze It!** NaClO is a bleaching agent. Such agents are used to whiten clothes and remove stains. Use different color marker pens to draw several lines on a piece of white paper. Add one drop of NaClO to each line. What happens? Try inventing a technique that you can use to make "bleach art."