

SMALL-SCALE LAB

Practice chem & naming elements
naming reactants & Products

$$1 + 2 + 3 = \text{BLACK!}$$

SAFETY



Wear your safety glasses and follow standard safety procedures as outlined on page 18.

PURPOSE

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

MATERIALS

- pencil
- ruler
- chemicals shown in Figure A
- paper
- reaction surface
- pipette

PROCEDURE

Draw two grids similar to Figure A on separate sheets of paper. Make each square 2 cm on each side. Place a reaction surface over one of the grids and add one drop, one piece, or a few grains of each chemical, as shown in Figure A. Stir by blowing air through an empty pipette. Use the second grid as a data table to record your observations for each solution.

	NaOCl	H ₂ O ₂	CuSO ₄
KI			
KI + Starch			
KI + Paper			
KI + Cereal			

Figure A

ANALYSIS

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

1. What color is a mixture of NaOCl and KI?

2. What happens when you mix NaOCl, KI, and starch?
3. NaOCl is a powerful bleaching agent as indicated by its reaction with KI and starch. Is hydrogen peroxide (H₂O₂) a bleaching agent? Explain.
4. What happens when you add NaOCl and KI to paper? What ingredient does this suggest the paper contains?
5. What ingredient is contained in cereal? How do you know?

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 prove the presence of KI in iodized salt and the absence of KI in regular salt.
3. **Design It!** Laundry detergents, automatic dish washing liquids, and cleansers sometimes contain a bleaching agent similar to NaOCl. The purpose of the bleach is to whiten clothes and remove stains. Design an experiment to decide which laundry detergents and cleansers contain bleach.
4. **Design It!** Antacid tablets and other pharmaceuticals 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.
5. **Analyze It!** Mix one drop of NaOCl on a piece of colored construction paper. What happens? Try inventing a technique that will create some original "bleach art."
6. **Analyze It!** Other bleaching agents include FeCl₃, KIO₃, KMnO₄, and NaNO₂. Try mixing these with KI and starch to see what happens. What is the best agent to detect the presence of KI in table salt?