

POLICE LINE DO NOT CROSS

# WHAT'S THAT WHITE POWDER?

## QUICK PEEK

In this lesson, students become Forensic Chemists as they perform tests and analyze powders.

### SUGGESTED GRADE LEVELS: 4–8

### ILLINOIS STATE LEARNING GOALS

#### SCIENCE

11.A, 12.C, 13.A, 13.B

#### MATH

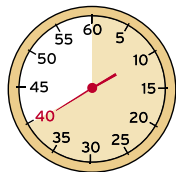
7.A, 10.A

#### LANGUAGE ARTS

4.A, 5.A

### OBJECTIVES

- ★ Students will correctly record information in a data table.
- ★ Students will make careful observations and draw conclusions.



**PACE YOURSELF:**  
40 MINUTES



### PREPARE YOURSELF

1. Make copies of data *Powder Analysis Chart*.
2. (Optional) Make one bag of each white powder for partners.



### MATERIALS

#### Per Partners:

- White chalk or white crayon
- Gloves
- Safety goggles
- Magnifying glass
- Measuring spoons
- Eyedropper
- Water
- Baking soda
- Sugar
- Salt
- Cornstarch
- Iodine solution
- Vinegar
- 4 Jars
- Dish towel
- 4 sheets of black construction paper

#### Per Student:

- Copy of the *Powder Analysis Chart*



## WHAT YOU NEED TO KNOW...

Students will perform scientific tests on four household powders in this lesson and observe how the powders react. When determining the identity of an unknown substance, crime lab experts must use testing procedures that give results that clearly distinguish one material from another.

Forensic chemists often perform more than one positive test on an unknown substance. When testing an unknown white powder to determine whether or not it is cocaine, the chemist will run a series of tests on the powder. If all tests are positive for cocaine, they can feel certain that the results are correct.



## WARM UP!

1. Hold up a bag of cornstarch and a bag of baking soda. Ask students: Are they the same or different?
2. Ask students: How can you tell the difference between two similar powders?
3. Tell students that today they are going to have the opportunity to become forensic chemists and study powders.

Forensic chemists rarely visit crime scenes; they handle evidence brought back to the lab. Evidence may include hair samples, paint chips, glass fragments, blood stains and more.

# WHAT'S THAT WHITE POWDER?



## THE HOW TO

*Students and teacher should be wearing safety goggles and gloves.*

1. Complete the appearance and texture activities before opening the vinegar and iodine bottles.
2. Place one-fourth teaspoon (1 ml) of the four white powders on a sheet of black construction paper. Label each powder with the white chalk or white crayon with numbers 1–4.
3. Study the powders with the magnifying glass. Examine what each powder looks like. How would you describe the powder's shape? Does it have large or small grains? Your observations should be written in the "Appearance" column of the chart.
4. Examine the powders further by rubbing each powder between your fingers. Describe how each powder feels in the "Texture" column of the chart.
5. Take the eyedropper and place a drop of water on each individual powder. Observe what happens. Do the powders dissolve? Is there a reaction? Write your observations in the "Reaction to Water" column.
6. Place one-half teaspoon (2ml) of each powder in each of 4 separate jars. Add 2 drops of iodine to each jar using the eyedropper. Record what happens in the "Reaction to Iodine" column. (Iodine should be handled with care.)

**TIP:** For younger students, go through the How-To step by step. For older students, print it out and have students work with their partner.



## WHAT'S GOING ON HERE?

In a lab setting, comparing test results of known substances can help forensic scientists identify unknown substances. In this lesson, students learn how important it is to make careful observations and record information.



## DID THEY GET IT?

1. After analyzing and recording results of each substance have your partner leave the area. Select and place one of the powders on construction paper and do not tell which substance it is. Invite your partner back to see if she/he can determine the powder by performing the same experiments and observations previously done. Change places so your partner can select one of the powders for you to identify. Can you correctly identify the mystery powder?
2. Collect and grade data table.



## ET CETERA

1. View the powders under a microscope.
2. **ACTIVITY:** Careers in Forensic Science

There are many career specializations in the field of forensic science (below is a short list of some of these careers). Have students work individually or in small groups to research some of these areas. Some ideas for presentation include creating brochures/job announcements or holding a mock career fair.

Forensic scientists work in laboratories, at crime scenes, in offices, and in morgues. They may work for federal, state and local government, forensic laboratories, medical examiners offices, hospitals, universities, police departments, medical examiner/coroner offices, or as independent forensic science consultants.

- Forensic entomology
- Handwriting or questioned document analysis
- Ballistics or firearm analysis
- Forensic anthropology
- Arson analysis
- Wildlife forensic investigation
- Fingerprint or forensic latent prints
- Forensic chemist or drug analysis
- Trace evidence analysis

\* Lesson adapted from the book *Detective Science: 40 Crime-Solving, Case-Breaking, Crook-Catching Activities for Kids* by Jim Wiese

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## POWDER ANALYSIS

SUBSTANCE	APPEARANCE	TEXTURE	REACTION TO WATER	REACTION TO VINEGAR	REACTION TO IODINE
BAKING SODA					
SUGAR					
SALT					
CORN STARCH					