

Classroom Detective Agency (CDA)



Someone broke into your classroom overnight and stole an object. Your teacher will let you know what is missing. The only evidence left behind was a mysterious white powder. People with access to the room at night are the custodian who used **baking soda** to clean crayon marks off a wall, the principal who has a fondness for powdered **sugar** donuts, the assistant principal who used **salt** to clean out stains in their coffee mug, the science teacher who stayed late to grade student projects made with **corn starch**, and the art teacher who made clay out of **flour**.

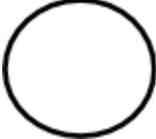
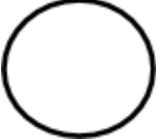
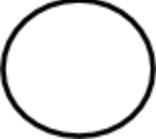
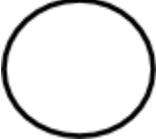
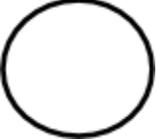
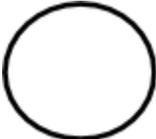
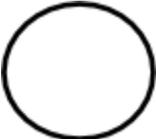
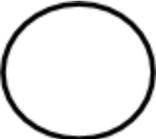
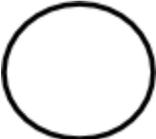
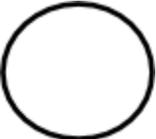
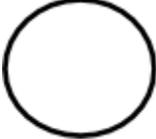
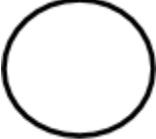
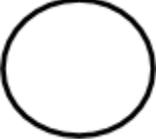
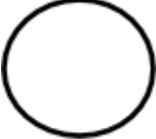
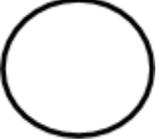
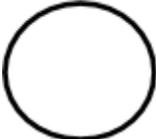
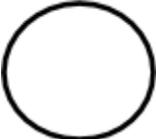
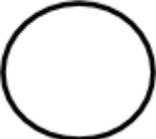
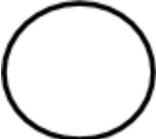
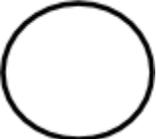
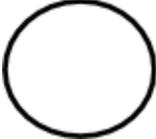
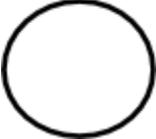
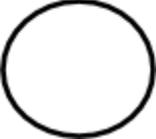
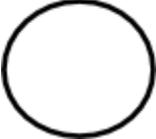
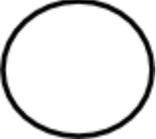
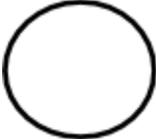
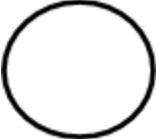
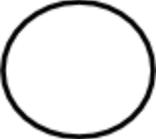
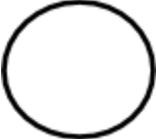
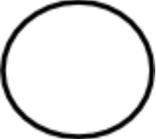
You will use your skills as scientists to identify the unknown powder and write a letter to a "judge" presenting the evidence and requesting the object be returned.

Here are a few safety rules for using chemicals and powders in the classroom.

- Always wear safety goggles when your teacher tells you to do so. Do not remove your goggles until your teacher says that it is OK.
- Be sure your teacher is aware of any allergies you may have.
- Carefully follow all instructions when conducting a science activity. Be sure to use substances exactly as described in the activity.
- Keep all materials used in the science activity away from your mouth, nose, and eyes. Do not place your hands on your face when conducting or cleaning after an activity.
- Never taste anything during a science activity.
- Tie back long hair, and secure loose clothing and dangling jewelry.
- Know the location of all safety equipment, such as the goggle cabinet, fire blanket, first-aid kit, and so forth, in or near your classroom
- Tell your teacher immediately if an injury, spill, or other accident occurs.
- Clean up your work area after conducting a science activity.
- Wash your hands with soap and water after completing a science activity.

Place a copy of page 3 under two Chem plates, lining up the wells so that you have wells of the plates matching the circles of the table. Using a small scoop, put an equal amount of each powder in the round plate wells. Be sure to look at the chart carefully to put the right powder in the correct wells. Once you have put the powders in the testing wells, record the color and texture of each powder in the last column on your recording sheet.

1. From this information, make a hypothesis about what you think the mystery powder is and why.
2. Using a small pipette or measuring device, put water in the wells of the 6 substances under the water, red litmus and blue litmus columns and look carefully at the results. Which of the substances dissolved?
3. Test the pH of the solutions in the wells with water and record the matching color results from the side of the vial. Also test the water wells with red and blue litmus paper. Be sure to use separate test strips for each substance. Record your results.
4. Add either red cabbage or blueberry solution to the powders in that column. Note the color of each sample on your data table and test the pH of these solutions and record those as well.
5. Did any of the powders change colors or pH with the red cabbage or blueberry solution?
6. Based on your results, what do you think the mystery powder is? Based on the clues, who do you think is the person responsible for the missing item from your classroom?
7. You are given two powders to identify. Explain what tests you would use to identify them with confidence.

Powders	Water Test and pH	Red Litmus Test	Blue Litmus Test	Cabbage or Blueberry Indicator	Color and Texture of Dry Powder
Flour					
Salt					
Sugar					
Corn Starch					
Baking Soda					
Mystery					

Construct a letter to the local judge on the next page explaining how you identified the mystery powder and why the person that you think is responsible should return the missing item. Be sure to use good letter construction and clear language to present your evidence.

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Submitted by:
Detective _____