

Whodunit?

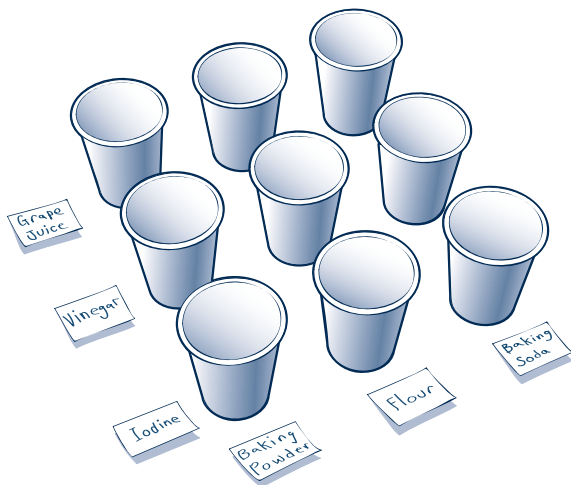
Today's challenge is to solve the case of the mystery substance—the secret is in the science!



1 Get what You need.

- Data table • Pencil • 3 cups, each with 1 tsp. of baking powder • 3 cups, each with 1 tsp. of flour • 3 cups, each with 1 tsp. of baking soda • 3 cups, each with 1 tsp. of the “mystery substance” • Purple grape juice • White vinegar • Iodine • 3 pipettes or eyedroppers • Paper towels • Sticky notes (to use as labels)

2 set up Your work station. Make labels for each powder and liquid listed on the illustration below and arrange in a grid. Get 3 cups of each powder (9 in total), and line them up under their labels. (Your cups with the mystery substance come later!)



3 Test, observe, and record. Put 5 to 10 drops of grape juice in one cup of baking powder. What happens? Record your observations on the data table (below). Now try the grape juice on the other two powders, recording your observations each time.

4 What's happening? In some cases, a chemical reaction will occur. Signs of this include foaming, fizzing, or a change in color. But sometimes no chemical reaction can be seen. Can you tell the difference?

5 Repeat steps 3 and 4 until you've tested all the liquids with all the powders and have written your observations in the data table. Use a new pipette with each liquid.

6 Test the mYstERY substance! Get 3 cups of the mystery substance and line them up next to the grape juice, vinegar, and iodine. Test and record your observations. (Hint: the mystery substance is one of the powders you already tested!)

	Baking Powder	Flour	Baking Soda	Mystery Substance
Grape Juice				
Vinegar				
Iodine				

Chew on This!

In this activity, you performed an experiment and analyzed data like a scientist does. A chemical will react in the same way every time, as long as the conditions are the same. You set up the experiment so that each powder was tested in exactly the same way. Then you observed the chemical reactions closely and recorded your data. When you drew conclusions about what the mystery substance was, your conclusions were supported by scientific evidence.

7 Compare data and draw conclusions.

Did your observations about the mystery substance match any of the powders you tested? By comparing your data, can you figure out what the mystery substance is? Explain your reasons. Did you prove Grandma Ruffman's innocence?

Cool science Jobs!

Did you like figuring out the mystery substance? Then you might love one of these jobs.

Forensic scientist

Imagine a job where you help put criminals behind bars or free innocent people! That's what forensic scientists do. They work in crime labs, analyzing evidence from the scene of a crime. A forensic scientist might test blood, DNA, gunshot residue, fingerprints, hair or fibers, poisons, mysterious stains, and other clues.



Food Scientist

Think of your favorite candy or ice cream. You can thank a food scientist for making it so delicious! It takes the right chemical know-how to make foods that stay fresh and taste good. But being a food scientist isn't just about dessert! They also develop healthy food to help relieve hunger and malnutrition around the world.



Watch the related FETCH! episode, "The People vs. Grandma Ruffman," on PBS KIDS GO! (check local listings) or visit the FETCH! Web site at pbskidsgo.org/fetch.



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Fold

Fetch!

Whodunit?

Help! Grandma Ruffman's been arrested! Detectives say she baked a cake with a metal file in it so that my notorious brother Scruff Ruffman could use it to break out of jail! But sweet old Grandma would never turn to a life of crime! The cake in question was made with baking soda, and they found something that looks like baking soda on her apron. Quick! Head to the crime lab and test it. Can you prove she's innocent?

GOOO FETCH!

