

Skills and Strategies

- Questioning and Predicting
- Planning and Conducting
- Processing and Analyzing
- Evaluating
- Applying and Innovating
- Communicating

Safety**What You Need**

- samples of matter to test (e.g., paper, cork, baking soda, copper, aluminum strips, table salt, sugar, carbon [graphite], cooking oil)
- water
- dilute acid
- test tubes
- test tube rack
- marker

Testing Physical and Chemical Properties of Matter

In this investigation, you will develop your own questions that will guide your study of the properties of matter.

Procedure

1. Your teacher will give you two samples of matter to study. Write out any questions you have about the properties of these samples.
2. Decide which questions you will investigate. Make predictions about the answers to your questions.
3. Plan a procedure that you will follow to answer your questions. A description of how to perform different tests is provided in the table on the opposite page.

You can use the questions below to help guide your procedure:

- What physical and chemical properties will I investigate?
 - How will I record and organize the observations I make? For properties that need to be rated, how will I do it? For example, how do I rate the lustre of a substance?
 - What procedure will I need to follow to study a particular property?
4. Have your teacher approve your procedure.
 5. Carry out your plan once your teacher has approved it.
 6. Dispose of any chemicals according to your teacher's instructions.

Evaluate

1. Did you determine the answers to your questions? If so, what are they? If not, why were you not able to? What other evidence would you need to answer your questions?

2. Share your results with your teacher, who will record them in a class chart. Reflect on the properties for all the substances that were studied.

- Look for patterns you can use to group the substances according to common physical or chemical properties.
- What groupings of substances can you make? Explain what these groupings are based on.

Apply and Innovate

3. Think about how each substance you studied is used. How do you think the physical and/or chemical properties of each substance are related to its function?

Tests for Properties

Properties	Test
Physical Properties	
colour, state, lustre	Describe the appearance.
malleability	Try to bend the solid material.
density	Calculate based on mass and volume.
texture	Feel the surface.
odour	Never inhale directly. Waft the air above the sample toward you and very gently inhale.
solubility in water	<ol style="list-style-type: none"> 1. Place 1 mL of water in a test tube. 2. Place a small amount of the sample being tested in the water. 3. Gently tap the bottom of the tubes with your finger while holding the tube in the other hand. 4. Look to see if all, part, or none of the sample dissolves.
Chemical Properties	
reactivity with water	<ol style="list-style-type: none"> 1. Place 1 mL of water in a test tube. 2. Place a small amount of the sample being tested in the water. 3. Gently tap the bottom of the tube with your finger to mix the contents. 4. Look for evidence of one or more new substances forming.
reactivity with acid	<ol style="list-style-type: none"> 1. Place 1 mL of dilute acid in a test tube. 2. Place a small amount of the sample being tested in the test tube. 3. Look for evidence of one or more new substances forming.