Topic 2.2
How do we use properties to help us describe matter?

Specific Expectations

- **C1.1** analyze how the chemical and physical properties of common elements and/or simple compounds affect the use of everyday materials that contain those elements and/or compounds
- **C2.1** use appropriate terminology related to the exploration of matter, including, but not limited to: combustion, conductor, decomposition, lustrous, precipitate, reaction, and soluble
- **C2.2** use an inquiry process to identify the physical and chemical properties of common elements and simple common compounds, including gaseous substances
- **C2.4** investigate and distinguish between the physical and chemical properties of household substances
- **C3.5** describe the characteristic physical and chemical properties of common elements

Skills

- make predictions or hypotheses based on research
- understand and follow safe laboratory procedures
- conduct inquiries, controlling some variables, to collect observations and data
- analyze data for reliability and bias
- make and justify conclusions
- communicate using appropriate language and a variety of formats

Materials

Please see the teaching notes for each activity for a list of the materials required. Please see page TR-40 for a summary of the materials required in this topic.

Overview

In this topic, students will discover the difference between a physical and a chemical property and will investigate and identify the physical and chemical properties of common materials. They will learn how to design their own inquiries and will continue to apply their knowledge of safe laboratory procedures.

Common Misconceptions

- **Students may have difficulty understanding how a chemical property is different from a physical property.** Explain that physical properties exist on their own (an apple is shiny) but chemical properties (like combustibility) describe the results of an interaction with something else (either energy or other matter).
- **Students may confuse physical and chemical changes with physical and chemical properties if they studied changes in earlier science courses.** Explain that a property is a characteristic of a substance whether or not it is interacting with another substance. For example, propane is combustible even when it is not burning. This is a chemical property. A change involves a change in some of the properties as a substance interacts with either energy or matter. For example, when an ice cube is heated, it melts and becomes a liquid. This is a physical change.

Background Knowledge

The terms physical change and physical property are closely connected. A physical change is any change in a sample of matter that does not change the composition of the particles of that sample. Denting a piece of copper does not change the composition of the particles. A physical property of a sample of matter is any property that can be observed during a physical change. Denting the copper provides evidence of the malleability of copper.

The terms chemical change and chemical property are closely connected. A chemical change is any change that causes a change in the composition of the particles. Reacting vinegar with baking soda changes the composition of both the vinegar and the baking soda. A chemical property is any property that can be observed only during a chemical change. Fizzing of vinegar and baking soda is evidence of the chemical activity of those two substances.

The need to understand the physical and chemical properties of matter is not limited to scientists or medical specialists. Chefs, dry cleaners, jewellers, painters, photo developers, printers, cleaners, and others all need to choose the correct chemicals for specific tasks, identify chemicals that are mislabelled, and safely interact with the chemicals they use in their jobs.

Literacy Strategies

Before Reading

- Ask students to look at the photographs and predict what the text is about.
- Many of the names of physical and chemical properties will be new to students. Preview these new terms. Have students list the physical and chemical properties of matter that appear on pages 106 and 108 of the student textbook and add the words to the word wall. Ask students to use the photographs and definitions in the textbook to explain what each property means.
- Call out a property and challenge students to find examples of that property on the textbook page.

During Reading

- Have students identify which property is being discussed and describe the images that come to mind.
- ELL English language learners would benefit from a more guided activity because of the language demands. For example, in Table 2.2, start with the first property, conductivity. Read the text aloud, and pick out the key vocabulary (electrical, conductor, current). Talk about what this means and then read the example and the definition in the margin.

After Reading

- Students can summarize what they learned in a visual glossary. Have them include the term, its definition, and a picture. English language learners would benefit from working with a partner or having you guide this process. These strategies demonstrate note-taking and provide students with another chance to clarify language and concepts.
- Students can create wanted posters for a substance using at least three physical or chemical properties that were in the topic. Make sure that English language learners know what is meant by a wanted poster.

Assessment FOR Learning

Tool	Evidence of Student Understanding	Supporting Learners
Learning Check, page 107	Students define "physical properties" and give examples.	• Have students work in pairs. • Review the meanings of Key Terms with students. • Cut the properties, definitions, and examples on **BLM 2-7 Physical and Chemical Properties**, apart and have students arrange them to show understanding.
Activity 2.4, page 107	Students describe the physical properties of materials and explain how the physical properties make each material suitable for its use.	• Deconstruct Table 2.2 and the list of materials with students to help them see how they can use this information to design their table and procedures. • Supply students with **BLM 2-8 Sentence Starters**. The blackline master has completion sentences that prompt students to think about methods of testing the materials.
Activity 2.5, page 109	Students identify and differentiate between the physical and chemical properties of substances.	• Refer students to Table 2.2 and Table 2.3 to help them differentiate between physical and chemical properties.
Learning Check, page 109	Students define "chemical properties" and give examples.	• Have students work in pairs. • Review the meanings of Key Terms with students. • Cut the properties, definitions, and examples on **BLM 2-7 Physical and Chemical Properties**, apart and have students arrange them to show understanding.
Investigation 2A, page 110	Students identify the physical and chemical properties of household substances and describe the substances' similarities and differences.	• Supply students with **BLM 2-8 Sentence Starters**. The Blackline master has completion sentences that prompt students to think about methods of testing the materials. • Design an experiment for one property with the whole class so students can get ideas from their peers. You might need to show how to keep the steps consistent for each material being tested.

Topic 2.2 (Student textbook pages 104–111)

Using the Topic Opener

- Students will relate to a discussion of food and its properties. Challenge them to think of more foods that have distinctive properties. You could ask them to think of a fast food commercial that exploits some of the properties and extend this to a discussion about how media influences purchasing.
- ELL Introduce the scientific language used in this topic by providing students with sample materials and examples from the Background Knowledge section. Choose examples that are common or give more than one example of each type. For example, some English language learners may not understand references to things like propane or even vinegar. Mix baking soda and vinegar and describe what is happening. This will give students an opportunity to meet the big ideas and use the language found in the text. Have them look at the charts in the textbook. Explain how the charts are laid out and place the examples you have used on the charts.
- Most students will know the common April Fool's Day trick of switching sugar for salt. Discuss how the properties of sugar and salt make this trick easy to perform. (They are both white crystals and both dissolve in water.) As an extension, bring in samples of salt and sugar for students to examine. Challenge them to describe salt and sugar using properties other than taste to distinguish the two substances.

Starting Point Activity (Student textbook pages 104–105)

Pedagogical Purpose

The purpose of this activity is to introduce students to the concept that properties are used to describe and identify substances. Every chemical in the world has at least one property that distinguishes it from every other chemical.

Planning	
Materials	Samples of each food in the activity (optional)
Time	15 min
Safety	Check if students have food allergies. Have students use utensils, not their hands to serve the food.

Activity Notes and Troubleshooting

- Have students who recognise these foods describe what they are (or are made of) and how they are used. Bannock is a traditional Aboriginal bread similar to pita or naan. Cumin is a spice used in Middle Eastern, Indian, and South American cuisine. Tahini is a sesame paste used in Middle Eastern cooking, notably in humus.
- You could bring in samples of each food for students to taste so they can describe the foods more accurately. Conduct this activity outside of the science laboratory. You could set up sampling stations with chart paper and have students record two properties after they taste each food.
- Before students start the activity, challenge them to describe one of the six foods to their partner using properties not listed in the textbook until their partner can guess which food it is.
- For step 1, students could work independently to describe three of the foods and then share their answers with a partner who has described the three other foods. They should record their partner's answers and add their own descriptions for the three new foods.

- The activity is a good diagnostic of prior knowledge. As a class, record the properties listed and add them to your word wall. Ask students to create a visual glossary that gives the word, its meaning, and a picture.

Additional Support

- Depending on students' prior knowledge, you might need to review properties and how to describe them. Have students brainstorm a list of descriptive words and then identify objects in the classroom or in their everyday lives that have each property.
- ELL English language learners may understand the properties and be able to describe them in their first language but may need help with the English translation.
- Instead of describing the foods using the photographs, you could stage a "crime scene" using the foods and objects found in the classroom and challenge students to describe the scene using as many properties as they can.
- The activity could be expanded into a multi-cultural activity where students bring in and talk about the properties of foods from their culture.
- Some students might want to use a thesaurus or a cookbook to get ideas of descriptive words.

Answers

1. Answers may vary. *Salsa*: red, spicy, liquid and solid. *Baklava*: sweet, sticky, crisp and soft. *Bannock*: solid, brown, bendable. *Cumin*: oblong, yellow, solid. *Green apple*: juicy, green and white, solid. *Tahini:* tan, grainy, liquid.
2. Answers may vary. Properties could include: viscosity, state, colour, texture, hardness, and lustre.
3. Answers will vary. Students might be surprised by how many foods have the same properties.

Instructional Strategies for Topic 2.2

Physical properties describe how matter looks and feels

(Student textbook pages 106–107)

- Have volunteers take turns reading the Physical Properties section on pages 106 to 107 aloud to the class. Then ask for responses. Have students experienced a similar example? What were they visualizing as they listened?
- Ask students to describe the photographs in Table 2.2 and how they think each photograph illustrates the physical property. Challenge them to suggest an alternate image they would use if they were designing the textbook. They should give one or two reasons why the image is appropriate.
- Set up stations around the classroom to illustrate each physical property in Table 2.2. Ask students to keep a list of questions they have about each station and discuss those questions as a class. Some examples:
  - *Conductivity*: a video of an MP3 player being recharged by a lemon; conductive and non-conductive materials and a conductivity tester; A simple conductivity tester can be made using a battery, a light bulb, three wires, and two alligator clips. Build a circuit with a space left for testing objects by touching them with the alligator clips. If the light goes on, the material is conductive. Caution students to be careful when handling wires attached to a battery.
  - *Density*: Have students compare placing a boiled egg in salt water to placing it in pure water. The egg is less dense than salt water, so it floats; it is denser than pure water, so it sinks.
  - *Lustre*: materials such as dull and shiny pennies.

- *Solubility*: Have students compare drink mix powder and water to drink mix powder and oil. Drink mix powder is only soluble in water.
- *Texture*: various materials such as fur, sandpaper, and acetate.

Chemical properties describe how substances can change when they interact with other substances (Student textbook pages 108–109)

- Demonstrate each chemical property in Table 2.3 after you read its description to the class.
  - *Combustibility*: Hold a small piece of filter paper with tongs and burn it with a match. Then hold a small piece of aluminum foil and try to burn it. The match and paper will burn; the aluminum will not.
  - *Reactivity with oxygen*: Burn a small piece of magnesium metal. Caution: Do not look at the metal as it burns. The flame is bright enough to cause eye damage.
  - *Reactivity with acid*: Place a small piece of calcium or zinc metal in weak acid and it will bubble.
  - *Reactivity with other substances*: Use a straw to carefully blow into a glass of limewater. The limewater will turn milky due to the formation of calcium carbonate precipitate.
  - *Decomposition*: Use a Hoffman apparatus to perform electrolysis of water and then impress students with flame tests for oxygen and hydrogen gas. Place a small amount of manganese dioxide in hydrogen peroxide to decompose the peroxide into water and oxygen gas.

Topic 2.2 Review (Student textbook page 111)

- ELL English language learners will benefit from using **BLM 2-13 Topic 2.2 Review (Alternative Format)**, which has simplified and clearer language. If they are using the Review in the student textbook, make sure that they understand the questions. For example, they may have never used a Venn diagram and may get caught up trying to figure out what is being asked. Preview the questions with students to clarify vocabulary (insulation), processes (explain), or sentence structure (However, imagine your teacher…). Students may not finish all of the questions but may give the big ideas.
- Add the new words from this topic to the word wall.
- Enrichment—Place students in groups and assign each group a physical or chemical property. Explain they will make a presentation to the class that shows how the property is important or useful to them or how that property helps a substance perform its job. Their presentation can be in the form of a poem, a song or rap, a role-play, or a cartoon. They must include a definition of the property, one example, and one practical use.
- Connect the usefulness of recognizing physical and chemical properties to different careers. Chefs have to understand how the properties of ingredients interact to make food that tastes good and has an appealing texture and appearance. Police and forensic technicians need to accurately describe evidence in a crime scene so that everyone working with the evidence can recognise it. Jewellers and metal workers need to understand many chemical properties of their materials such as reactivity to acids, oxygen, and water, as well as physical properties like lustre, texture, and density. You could have students name a career, then invite others to suggest how physical and/or chemical properties might be useful in that career.

Learning Check Answers (Student textbook page 107)

1. A physical property is any characteristic of matter that can be observed or measured without changing the type of matter. Examples could include lustre and density.
2. Answers may vary.
   - **a)** hard, smooth
   - **b)** smooth, dull
   - **c)** yellow, sweet.
   - **d)** colourless, odourless
3. **a)** Chefs need to consider the taste, smell and texture of the food they prepare.
   - **b)** Painters need to consider the colour, texture, and solubility of the paint they use in different rooms.
   - **c)** Carpenters need to consider the density, texture, colour, and lustre of the materials they use in their projects.

Activity 2.4 Linking Physical Properties of Objects with their Uses (Student textbook page 107)

Pedagogical Purpose

This activity is designed to introduce students to planning and conducting their own inquiry experiment. After completing this activity students should have an understanding of how properties determine the function of materials.

Planning	
Materials	Per group: 5 mL salt 2 cm copper wire Bottle cork 2 cm square of aluminum foil paper cup styrofoam cup plastic paper clip metal paper clip beaker 100 mL water eight stirring rods conductivity apparatus **BLM 2-8 Sentence Starters** (optional) **BLM 2-9 Activity 2.4** (optional)
Time	45 min
Safety	Do not eat anything in the science laboratory. Do not immerse electrical equipment in water.

Skills Focus

- work cooperatively
- follow laboratory safety procedures
- design a procedure
- record data in an appropriate format
- connect experiment results to the real world

Activity Notes and Troubleshooting

- Have students work in groups of four or fewer. Assign a role to each group member so that everyone is accountable. Students should create their own data table and record their results individually. Give English language learners a role that does not depend too much on language.
- Prepare the materials ahead of time in kits or place them at lab stations while students are preparing their procedures and data tables.
- Stress that students must show you their data table and procedure before they are allowed to perform their experiment.
- Remind students to use only the provided materials in their design and to look at Table 2.2 for help.
- You might want to model one step of an experiment or demonstrate how to use the conductivity tester.
- The paper clips use only a few common properties of metal and plastic, such as malleability and durability. Challenge students to consider additional properties of these materials and suggest uses that are unique to each material.
- Ask students to consider at least one more property that they feel is important to each item, such as colour or malleability.

Additional Support

- ELL Supply English language learners and other students who need scaffolding with **BLM 2-8 Sentence Starters** and **BLM 2-9 Activity 2.4**. The blackline masters have a sample properties table and completion sentences that prompt students to think about how to test the materials.
- Some students might need more support and encouragement to work through the activity. Deconstruct Table 2.2 and the list of materials with these students to help them see how they can use this information to design their table and procedures. Point out the format of the table (which they could use for their own table) and the photographs and text, which show tools they could use for their experiments. Ask why they might need 100 mL of water, a beaker, and a conductivity tester.
- Some students might not make the connection between conducting electricity and conducting heat. Have them read the conductivity section in Table 2.2. Ask them why glass might not conduct heat well. Why does it mention heat when the physical property is electrical conductivity? Have them name other materials that are used as conductors and insulators. This should help them recognise that aluminum is a useful conductor of heat and Styrofoam is a useful non-conductor of heat.
- If a group finishes early, ask them to perform their tests on three things in their pencil cases.

Activity 2.4 Answers

What to do

2. to 5. Tables and procedures may vary. Students should get approval for their experiments before proceeding.

Material	Density (compared to water)	Solubility (in water)	Lustre	Texture	Conductivity	Other
salt	heavier	dissolves	shiny	rough	not conductive	white
copper wire	heavier	does not dissolve	shiny	smooth	conductive	red-brown bendable
cork	lighter	does not dissolve	dull	rough	not conductive	beige, can be compressed
aluminum foil	uncertain; floats or sinks depending on if it is crushed or flat	does not dissolve	shiny	smooth	conductive	silver, bendable
paper cup	lighter	does not issolve	dull	smooth	not conductive	fragile
Styrofoam cup	lighter	does not dissolve	dull	smooth	not conductive	white
plastic paper clip	lighter	does not dissolve	shiny	smooth	not conductive	breaks easily
metal paper clip	uncertain; can sometimes float but usually sinks	does not dissolve	shiny	rough	conductive	bendable

What Did You Find Out?

1. Answers may vary. See table above.

2. Salt dissolves in water so it can be used easily in cooking.
Copper conducts electricity very well so it is used in electrical wiring.
Cork can be compressed and does not dissolve in water so it can be used to seal bottles.
Aluminum foil is very flexible and conducts electricity and heat well, so it can be used to wrap food that is being cooked in an oven or on a grill.
The paper used in the paper cup does not dissolve in water so it can be used to hold liquids.
The Styrofoam in the Styrofoam cup does not dissolve in water and does not conduct electricity or heat, so it can be used to hold hot liquids.
Metal seems to be a better material for paper clips than plastic. The metal paper clip is rough so it does not slip off the paper like the smooth plastic paper clip. The plastic paper clip can break while the metal paper clip can be bent back into its original shape.

Inquire Further

Answers may vary. Physical properties could include colour, odour, or malleability.

Activity 2.5 Identifying Chemical and Physical Properties of Substances (Student textbook page 109)

Pedagogical Purpose

The purpose of this activity is to challenge students to differentiate between chemical and physical properties.

Planning	
Materials	Per group: one spoonful baking soda, $NaHCO_3$ (substance A) one spoonful calcium chloride or road salt (substance B) 10 mL bromothymol blue (substance C) two small spoons 10 mL graduated cylinder 1 resealable plastic bag beaker (optional) **BLM 2-10 Activity 2.5** (optional)
Time	40 min
Safety	Wear goggles, gloves, and an apron. Bromothymol blue is poisonous and might cause skin irritation.

Skills Focus

- communicate results using a data table
- make conclusions based on inquiry

Activity Notes and Troubleshooting

- Have students work in small groups.
- Set out quantities of the materials for students to study while making their initial observations of the physical properties. Then divide the materials into smaller portions for each group to test. This will prevent accidental mixing before they observe each chemical on its own.
- Students could mix the chemicals in a partly filled beaker instead of a plastic bag. This would avoid any potential issues with the baggie leaking or breaking. Gently swirling the chemicals in the beaker will mix them sufficiently to cause a reaction.
- Bromthymol blue is yellow in acid solutions, green in neutral solutions, and blue in basic solutions. Students should see the colour of the solution change to yellow as carbon dioxide gas is released.

Additional Support

- DI ELL Spatial learners and English language learners will benefit from a pictorial representation of the procedure. Have them read each step, then work in pairs to draw what to do. Check their pictures before they perform the activity to ensure they understand what to do.
- Students who find the table provided in the activity confusing can use **BLM 2-10 Activity 2.5** to record their results.
- ELL For What Did You Find Out? question 2, give English language learners a similar question ahead of time to ensure they understand what they are being asked to do. Model writing reasons.
- Enrichment—Ask students if the chemical properties would be different if the substances were mixed in a different order.

Activity 2.5 Answers

What Did You Find Out?

1.

	Physical Properties	Chemical Properties
Substance A	solid, white powder, soft texture	reacts with acids by bubbling, forms a precipitate
Substance B	crystalline white solid, rough texture	
Substance C	blue liquid	
Mixture of substances (after)	cloudy, yellow liquid	

2. The properties changed.

3. Chemical properties can only be observed after chemicals are mixed.

4. Chemical properties are visible only after chemicals are mixed. Physical properties can be observed in each substance on its own.

Learning Check Answers (Student textbook page 109)

1. A chemical property is something that describes how substances can change to produce new substances with new physical properties when they interact with other substances. Examples are reactivity with oxygen and combustibility.

2. Beeswax is soft, which is a physical property (texture). Beeswax is combustible, which is a chemical property (combustibility).

3. Propane is combustible. This is helpful because it gives off heat when it burns which can be used for cooking. It is hazardous because it burns very easily and can cause a fire or an explosion if not handled carefully.

Investigation 2A Physical and Chemical Properties of Substances in the Home (Student textbook page 110)

Pedagogical Purpose

In this investigation, students expand on their knowledge of the inquiry process and apply their understanding of physical and chemical properties by exploring the physical and chemical properties of common household substances. This investigation further prepares students for the unit inquiry project.

Planning	
Materials	Per group: 10 mL table sugar 10 mL baking soda 10 mL salt 20 mL vinegar 4 cm square of aluminum foil Additional chemicals such as flour, powdered sugar, or plastic wrap. six test tubes and test tube rack 100 mL water six stirring rods conductivity apparatus Other equipment as needed, such as a BBQ lighter. **BLM 2-8 Sentence Starters** (optional) **BLM 2-11 Investigation 2A** (optional) **BLM 2-12 Alternative Investigation 2A** (optional)
Time	180 min
Safety	Wear goggles, gloves, and an apron. Do not immerse electrical equipment in water. Do not eat or drink anything in the science laboratory. Clean up spills immediately.

Background

The physical and chemical properties students are investigating are described in Table 2.2 and Table 2.3. Start a class discussion about the importance of using chemicals in the home properly and safely. You could explain the chemical reactions that might be cause by mixing cleaners to underline the potential dangers. For example, chlorine based cleaners, such as bleach, produce toxic chlorine gas when mixed with acids. Ask students about reactions they have heard about that relate to common household substances. Which of these do they believe would really happen? (Some may be urban myths.)

Skills Focus

- work cooperatively
- follow laboratory safety procedures
- design a procedure
- record data in an appropriate format
- connect experiment results to the real world

Activity Notes and Troubleshooting

- To model the design process, have students choose a property as a class and design an experiment for it. Encourage students to think aloud as you write the procedure on the chalkboard. You might need to explicitly point out how to keep the steps consistent for each material being tested.

- Have students work in groups of four. Assign each student a role so everyone feels accountable. Each student could perform one of the tests for the more active properties (conductivity, solubility, reaction with acid, combustibility) and then the group could observe the remaining two physical properties.
- Prepare packages of materials ahead of time. You can place the materials at the laboratory station while students are designing their procedures or they can be picked up by each group when you approve their plans.
- Before students plan their procedures, have a class discussion about what additional materials they might want. Explain that you may need to limit their choices to keep the experiments safe and to ensure they can complete the investigation in the given time. Ask students to give reasons for the materials they want. Once you have approved the additional materials, supply students with a list and remind them to keep to the list.
- Instead of using glass stirring rods, use wooden splints or coffee stir sticks. This decreases the chances of breakage and simplifies cleanup.
- Encourage students to apply the skills and knowledge they gained in Activity 2.4 to designing this new procedure. Students can refer to their notes or to **BLM 2-9 Activity 2.4,** if they completed it.

Additional Support

- ELL Supply English language learners and other students who need scaffolding with **BLM 2-8 Sentence Starters**. This Blackline master has completion sentences that prompt students to think about how to test the materials.
- Students who are unable to think of appropriate procedural steps can approach you for hints. Provide them with just enough information to get them onto the next step.
- As an alternative Investigation, students could explore the properties of mystery white powders. Provide students with **BLM 2-12 Alternative Investigation 2A** and challenge them to correctly identify the white powders listed in the Blackline master using appropriate tests. (Substance A is baking soda, substance B is white flour, substance C is sugar, and substance D is salt.)
- Enrichment—Students could create an advertisement for one of the materials that describes its properties. Or they could produce a flow chart showing a procedure for identifying food items if the labels have fallen off.

Investigation 2A Answers

What To Do

1. Procedures may vary. Students should get approval for their experiments before proceeding. The procedure could look like this:

Follow these steps for each sample. Record your observations after each step.

1. Observe the sample's lustre and texture.
2. Test conductivity of dry sample.
3. Place a small amount of the sample into water and observe its density and whether it is soluble. Stir the mixture and then test its conductivity.
4. Place a small amount of the sample into vinegar and observe.

What Did You Find Out?

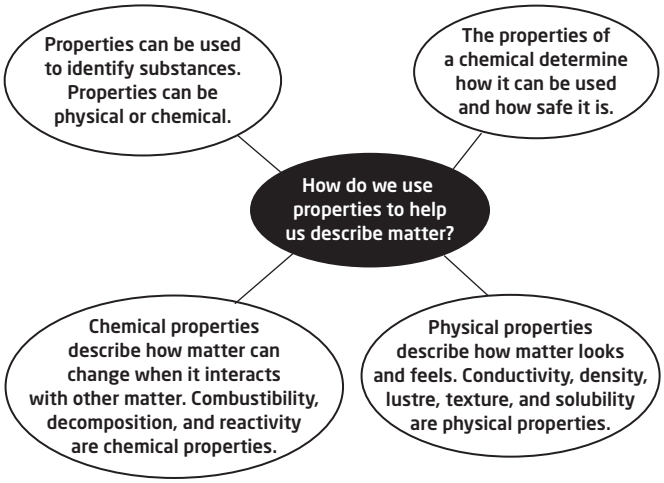
1. Answers may vary. Baking soda fizzes in acid. Salt water is conductive but salt is not conductive. Aluminum is conductive.
2. Answers will vary. Evaluation should describe which tests were effective and which were not and give reasons. Students should give one or two facts to justify each change or improvement.

Topic 2.2 Review

Please see also **BLM 2-13 Topic 2.2 Review (Alternative Format)**.

Answers

1.



2. Paper clips can bend, they are not water soluble, and they are smooth so they do not tear the paper.

3. *Similarities*: Both properties describe matter, are used to identify substances, and determine how matter is used. *Differences*: A physical property can be observed without changing the form of the matter. For example, texture is how matter feels to the touch. A chemical property can only be observed when matter is interacting with matter or energy. For example, to observe combustibility, the matter must be burned.

4. a)

Physical Properties			Chemical Properties
Texture	**Solubility**	**Odour**	**Combustibility**
rough	soluble in water	smells sweet	burns after it melts

b) Teachers would wear safety goggles to protect their eyes, an apron to protect their clothes, and gloves if the substance was corrosive or toxic. The material would be heated slowly to prevent any parts flying off in an explosion. The room would be well ventilated to protect from the fumes the substance gave off as it melted.

c) Some substances can react when placed into water. Other substances are explosive when heated. The fumes might have been toxic.

5. The property being described is density. The stone is denser than water and the wood is less dense than water.

6. Conductivity determines what type of material is good for insulation. A poor conductor will not allow heat to travel through it and will keep heat in the house.