

# 2 Pure Substances and Mixtures

## Background Information for Teachers

This lesson introduces several new terms that have specific meaning regarding matter. Students will need to have a firm grasp of these terms if they are to understand the lessons that follow.

**Pure Substance:** matter consisting of only one type of particle (e.g., distilled water, refined sugar)

**Mixture:** matter consisting of more than one type of particle (e.g., air, tap water, granola). Mixtures can be divided into two categories: mechanical mixtures and solutions.

**Mechanical Mixture:** a mixture where individual particles can be identified (granola, concrete). Mechanical mixtures can be homogeneous or heterogeneous.

**Homogeneous Mixture:** a mixture where particles of each component substance are evenly dispersed

**Heterogeneous Mixture:** a mixture where particles of each component substance are not evenly dispersed

**Solution:** a mixture where individual particles are interspersed homogeneously. Individual particles cannot be identified (air, tap water).

## Materials

- 8 glass jars or other transparent containers (at least 500 mL each)
- water
- granulated sugar
- breakfast cereal (such as granola that has different parts that can be viewed easily)
- index cards
- chart paper
- markers

- candle or wooden splint
- matches
- food colouring
- rice
- marbles or pebbles
- chicken noodle soup
- carbonated water or soda pop

## Activity: Part One: Define and Illustrate

Place two glass jars (or other transparent containers) on the desktop. Fill one jar with granulated sugar. Fill the second jar with breakfast cereal. Label the jars A and B. Ask your students to describe the contents of each container. Record their responses on chart paper.

On two index cards, record the terms *pure substance* and *mixture*. Challenge students to place these cards in front of the appropriate jars. As a class, discuss definitions of a pure substance and of a mixture.

Individually, or in small groups, have students complete Activity Sheet A. Once they have completed this sheet, have them share their responses with the group.

## Activity Sheet A

### Directions to students:

Define the terms *pure substance*, and *mixture* in your own words. Draw a diagram that illustrates the difference between a pure substance and a mixture. List several examples of pure substances and mixtures in everyday life (2.2.1).

Date: \_\_\_\_\_

Name: \_\_\_\_\_

# Pure Substances and Mixtures

Define the following terms in your own words:

Pure substance:

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Mixture:

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Draw a diagram that illustrates the difference between pure substances and mixtures.

Pure Substance	Mixture

List some examples of pure substances and mixtures in everyday life.

Pure Substance	Mixture

Date: \_\_\_\_\_

Name: \_\_\_\_\_

# Classifying Mixtures

<p>Mixture of gas and gas</p> <p>Jar # _____</p> <p>Substances:</p> <p>_____</p> <p>and</p> <p>_____</p>	<p>Mixture of solid and solid</p> <p>Jar # _____</p> <p>Substances:</p> <p>_____</p> <p>and</p> <p>_____</p>	<p>Mixture of solid and gas</p> <p>Jar # _____</p> <p>Substances:</p> <p>_____</p> <p>and</p> <p>_____</p>
<p>Mixture of liquid and liquid</p> <p>Jar # _____</p> <p>Substances:</p> <p>_____</p> <p>and</p> <p>_____</p>	<p>Mixture of gas and liquid</p> <p>Jar # _____</p> <p>Substances:</p> <p>_____</p> <p>and</p> <p>_____</p>	<p>Mixture of solid and liquid</p> <p>Jar # _____</p> <p>Substances:</p> <p>_____</p> <p>and</p> <p>_____</p>

Define homogeneous mixture, and give an example:

\_\_\_\_\_

\_\_\_\_\_

Define heterogeneous mixture, and give an example:

\_\_\_\_\_

\_\_\_\_\_

Name: \_\_\_\_\_

# Unit Glossary

**Diagrams and Examples:**

**Diagrams and Examples:**

**Diagrams and Examples:**

**Definition:**

**Definition:**

**Definition:**

**Term:**

**Term:**

**Term:**

