

Assessing Our Progress



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What are the properties of the substances in this mixture?

INTRODUCTION

This lesson is designed to help your teacher discover how much you have learned from the first two parts of the module. The test you are going to take is in two parts. The performance assessment is an inquiry in which you will describe the properties (including the appearance) of several different substances that make up a mixture. The written assessment consists of a series of multiple-choice and short-answer questions. As in Lesson 9, many of these questions challenge you to use your knowledge and skills to interpret scenarios, data tables, diagrams, and graphs.

OBJECTIVES FOR THIS LESSON

Determine the physical properties of substances that make up a mixture.

Answer questions based on the first two parts of this module.

Getting Started

1. Your teacher will assign you a set of materials.
2. You will have 20 minutes to complete each part of the assessment. Do not talk to other students.

Inquiry 19.1 Describing the Components of a Mixture

PROCEDURE

1. Check the items on your desk against the materials list. Listen carefully as your teacher explains the inquiry and then read the rest of these procedures before you begin the inquiry.

MATERIALS FOR LESSON 19

For you

- 1 copy of Student Sheet 19.1: Performance Assessment
- 1 copy of Student Sheet 19.2: Written Assessment
- 1 pair of safety goggles
- 1 test tube containing approximately 5 mL of a mixture
- 1 250-mL beaker containing 100 mL of water

- 1 test tube
- 1 petri dish base or lid
- 1 lab scoop
- 1 pipette
- 1 magnet
- 1 metric ruler
- 1 loupe (double-eye magnifier)
- Access to water
- Access to two containers for disposal of waste

For you and your lab partner

- 1 test tube rack

2. The mixture you have been given contains several substances. Use the apparatus on your desk to determine the physical properties of the substances. You have about 20 minutes to complete the inquiry.
3. For each substance, write a short description in the spaces provided on Student Sheet 19.1. Try to include as many physical properties for each substance as you can. Use the correct vocabulary. Here are *some* useful words you may want to use: color, insoluble, soluble, crystals, magnetic, and density.
4. When you have completed Inquiry 19.1, answer the questions on Student Sheet 19.2: Written Assessment. You have about 20 minutes to complete this assessment.

SAFETY TIP

Wear your safety goggles throughout Inquiry 19.1.

PANNING FOR GOLD

Gold is a very popular metal. It has a beautiful yellow luster. It is soft and easy to shape into jewelry. It conducts electricity very well, so it is great for use in electronic devices. It doesn't rust or tarnish, so it is always shiny. It is also very rare.

Fortunately, for those who want to find gold, it is extremely dense. Gold prospectors use the great density of gold to separate rare gold flecks from ordinary rocks, pebbles, sand, and silt.

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Hard Work

Panning is the simplest technique for finding gold in streams and rivers. All that is needed is a simple flat pan, a strong back, and patience. The prospector shown in the photograph above tried his luck in the Yukon gold rush.

Speeding Things Up

Gold rush prospectors (like the one shown in the drawing) found gold in rivers and streams, because rain had

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CYNTHIA BRITO/DOB STOCK PHOTO



This sluice is being used by prospectors in Amazonia to separate gold from water and mud.

washed it there from surrounding hills over thousands of years.

The dense flakes of gold settled quickly in streams and were caught in nooks and crannies on the bottom. Panning worked well at first. But once all of the easy pickings were gone, prospectors began to use water jets to wash whole hillsides

away. They then used long sluices to search through the washings. Sluices are wooden troughs with riffles in the bottom. The gold would get stuck in the riffles as water and mud washed down the sluice. Every now and then, the prospectors would stop the flow and remove the gold.

Because this method of prospecting caused large amounts of silt to pollute rivers, it was restricted in California as early as the 1880s.

Density Makes It Possible

Only a small portion of gold washed into a river is in the form of nuggets big enough to see easily. Most gold

in a stream is dust—tiny flecks mixed in with ordinary dirt. These dust particles aren't heavy; each one weighs only a fraction of a gram. But gold particles, no matter how small, are the densest part of the mix. This causes the gold flecks to sink through water faster than everything else.

To prospect for

gold, prospectors use a pan to dredge up silt and rocks from the bottom of a river. They pick out the big rocks and add water from the river to the pan. Then they swirl the pan of silt and water, allowing anything that does not sink quickly to the bottom of the pan to flow out of the pan (see the photograph).

Prospectors repeat this process until they are left with only “black sand,” which is very dense. If they are lucky, the black sand will contain tiny gold flecks. Then they pick out the flecks, and start again. If they are very lucky, they will find nuggets of gold (see the photograph). □

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QUESTIONS

Use library and Internet resources to investigate other methods of gold extraction. Answer these questions: Which countries produce gold? What are the main uses of this metal?