Elements, compounds and mixtures: particle drawings and the torch test

Name: Class: Date:

Page 1 has boxes to draw the particles of elements, compounds and mixtures in. Page 2 is a record sheet for the torch test on water and milky water.

DRAWING Draw the particles

1. Draw each atom as a small circle with its symbol inside: O for oxygen, H for hydrogen, C for carbon, N for nitrogen, Ar for argon, Cu for copper and Ni for nickel. The letters only tell the types of atom apart.
2. Draw the atoms in a molecule touching, and leave space between the particles of a gas. In a solid, such as copper or the coin, draw the atoms packed close together in rows. Draw at least eight particles in each box, then write element, compound or mixture under it.

Oxygen gas, O_2

Element, compound or mixture:

Water, H_2O

Element, compound or mixture:

Carbon dioxide, CO_2

Element, compound or mixture:

Air

Element, compound or mixture:

Copper

Element, compound or mixture:

A 20 cent coin

Element, compound or mixture:

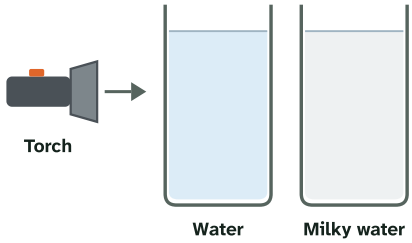
1. Oxygen gas and water are both made of molecules. How do your drawings show that one is an element and the other is a compound?

2. Water has a formula, H_2O. Use your drawing of air to explain why air has no formula.

PRACTICAL The torch test

Each group needs: two clear straight-sided glasses or jars, or 250 cm^3 beakers, water, milk, an eye dropper or plastic pipette, and a small torch.

> **Safety.** Do not shine the torch into anyone's eyes, and use a torch, not a laser pointer. Tell your teacher about any breakage, and wipe up spills. Wash your hands afterwards. Never eat or drink anything in the laboratory.



My predictions, before the practical: what will the beam look like in (1) the water and (2) the milky water?

1.

2.

What to do

1. Fill both glasses with water.
2. Add drops of milk to one glass until it looks cloudy, about 10 drops.
3. With the glasses side by side, shine the torch through both of them, and look at the path of the beam in each. Write what you see in the table.
4. Leave both glasses to stand for 10 minutes, and look again. Write what you see.

Glass	What it looks like	The torch beam inside it	After 10 minutes
Water			
Milky water			

1. In which glass could you see the path of the beam? Use the word scatter in your answer.

2. Is milky water a solution, a colloid or a suspension? Give two pieces of evidence from your table.

3. Muddy water also looks cloudy. Describe a test that would tell muddy water and milky water apart.