Diagnostic/Introductory Activity

Examine the pictures below and identify the hazard and to what degree (danger, warning, or caution) a product is dangerous

Compounds and Elements

Suggested time: 1.2 Hours

What's important in this lesson:

- understanding the meaning of both HHPS and WHMIS symbols
- explain how scientists classify matter
- distinguish between metals and non-metals and identify some of their uses

Complete these steps:

1. Complete the Diagnostic/Introductory Activity. Get this checked as being completed on your Course Checklist.

2. Get a textbook, either *Science 9, Science 9 Concepts and Connections, or Science Power 9* and get started on the student handout. If you are having difficulty with a section, note this in the section below: Questions for Teacher and move on to the next activity in your student handout. You'll need to use the internet for the last page on the student handout.

3. Once the student handout is complete check your answers or your teacher will with the Answer Key. Get this checked as being completed on your Course Checklist.

4. You'll need at least 10 -15 minutes to complete the quiz on the material you've reviewed today. If you've got at least that much time ask your teacher for the quiz and hand the quiz in when you're done. If you don't have enough time move on to the Reflective Activity and try the quiz next day.

5. Complete the Reflective Activity. Get this checked as being completed on your Course Checklist.

Hand-in the following to your teacher:

1. The lesson quiz.

Questions for the teacher:

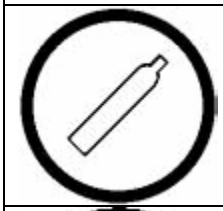
Compounds and Elements

Safety in the Lab

Many of you are familiar with the Hazardous Household Product Symbols (HHPS). You reviewed some of these in the previous introductory activity. However, when one works in industry there is a second set of product symbols you should become familiar with. This labeling system is called the Workplace Hazardous Materials Information System (WHMIS).

Using either *Science 9: Concepts and Connections pg 10*, *Science 9 pg 14, or Science Power 9 pg 597,* complete the table below by identifying the hazard associated with each symbol.

Table 1: WHMIS Symbols

1. You've been asked to place a check (√) through all those WHMIS symbols that apply to the following products

Spray paint	A flammable, poisonous liquid stored with a pressurized can	
Cleaner	A corrosive, toxic liquid	

Propane cylinder	A container that holds flammable propane gas under pressure	
Paint Thinner	A poisonous, flammable liquid	

2. Being safe in a workplace, or even a school lab, is everyone's responsibility. Examine the illustration below and list at least 8 unsafe situations you see

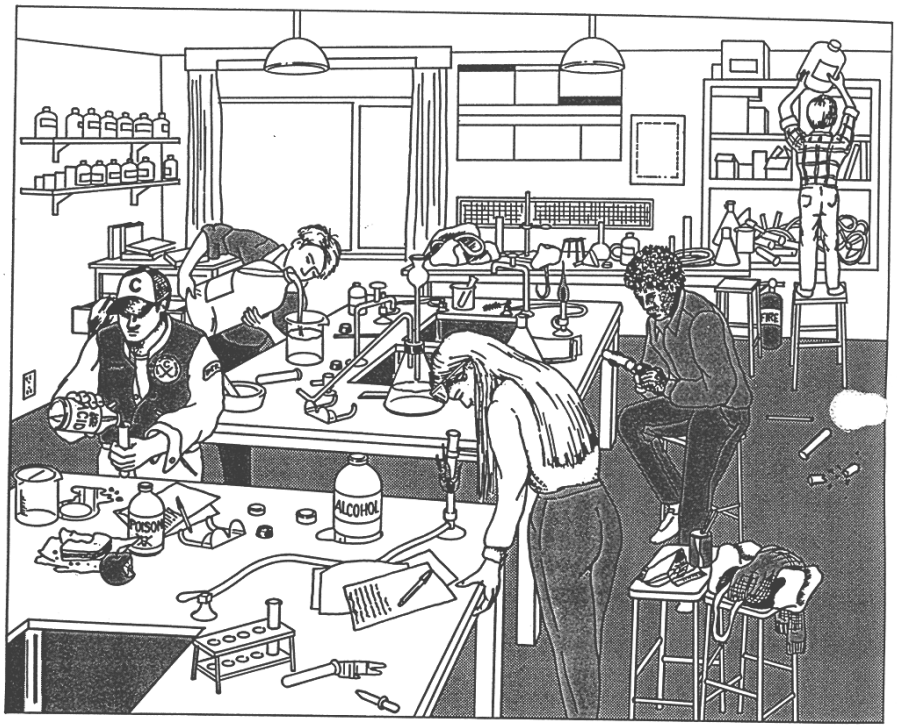


Figure 1 Lab Safety

1

2

3

4

5

6

7

8

Classifying Matter

There are thousands of different chemicals that you come across everyday, from the foods you eat to the clothes you wear. Scientists are interested in organizing chemicals into groups.

The first step in classification involves an examination of the particles that make up a substance. If all the particles in a substance are identical to each other the chemical is said to be a pure substance. If not, the substance is said to be a mixture**.** The diagram below has a magnified view of a plastic container holding air, water, and a copper penny.

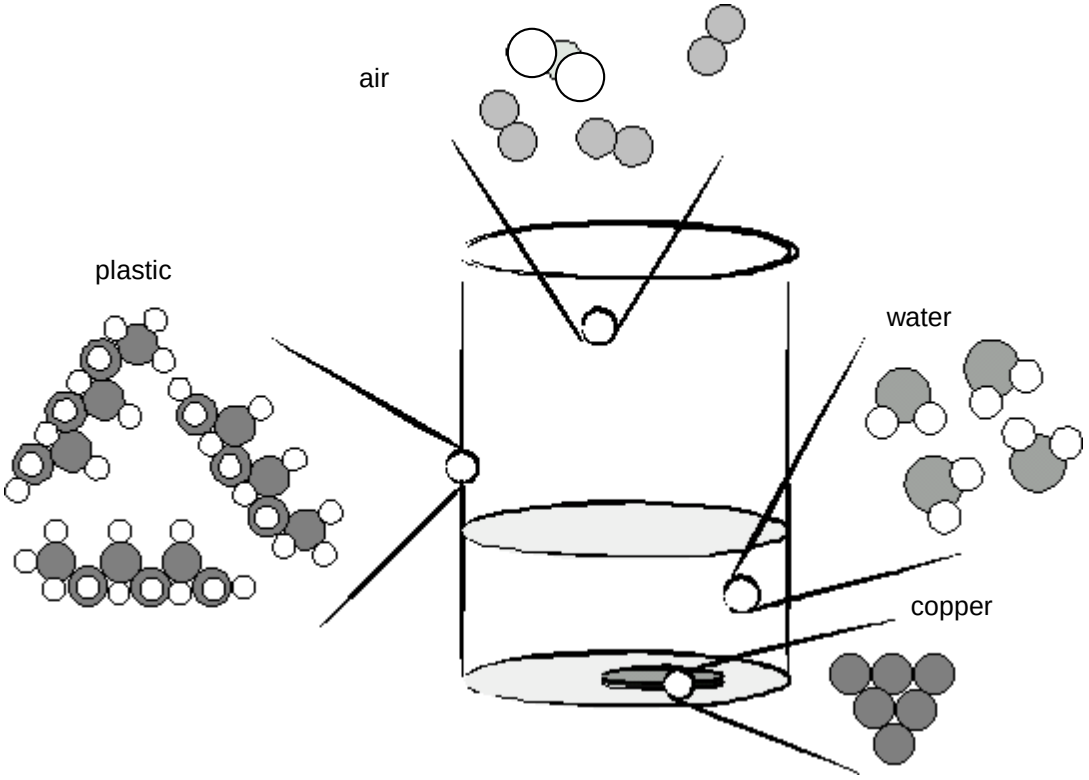


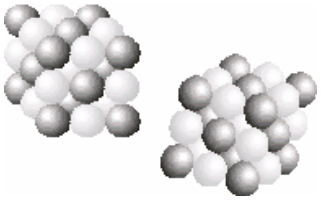
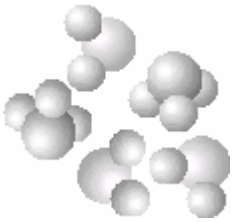
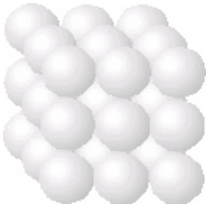
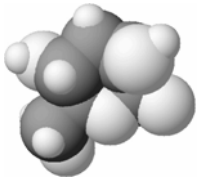
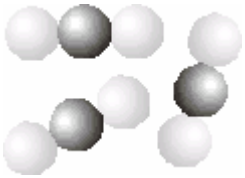
Figure 2 Classifying Matter

In this illustration the plastic, copper and water are all made of identical looking particles and would be called pure substances, while the air is a mixture.

If the atoms that make up a pure substance are only one type, as in the case of copper, one calls the pure substance an element. If the atoms that make up the particles of pure substance are different, as in water or plastic, the pure substance is called a compound.

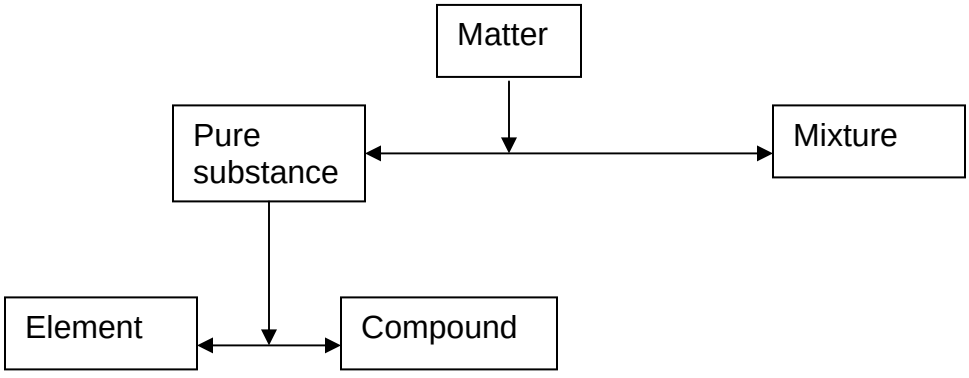
There are only 92 naturally occurring elements that can be arranged to make millions of compounds in much the way 26 letters can be arranged to make thousands of words.

3. Examine the chemicals in the table below and decide if they are pure substances or mixtures. If the chemical is a pure substance decide if it is an element or a compound.

 salt		 window cleaner	
 sea water		 gold	
 sugar		 carbon dioxide	

A summary of what has been reviewed so far is presented below.

Figure 3: Classification Summary



.

Metals and Non-metals

As mentioned earlier, there are some 92 natural elements. These elements can be used on their own or in combination with other elements in a wide variety of applications. Their use is determined by the elements properties. Elements can be further divided into two categories, metals and non-metals

The metals are:
- bendable (or malleable)
- good conductors of heat and electricity
- shiny (or lustrous)

The non-metals are:
- brittle
- poor conductors of heat and electricity
- dull

4. In this next activity you will be exploring some of the uses of these elements. Your source of information will either be the internet website http://www.webelements.com/ or a Periodic Table from The Chemical Institute of Canada.

Metal	Uses
sodium	
potassium	
mercury	
aluminum	
tungsten	

Non-metal	Uses
hydrogen	
fluorine	
chlorine	
neon	
sulfur	

titanium	
nickel	
iron	

nitrogen	
phosphorus	
argon	

Assessment and Evaluation: Unit 1 Lesson 1

Indicate whether the sentence or statement is true or false. If false, change the identified word or phrase to make the sentence or statement true.

____ 1.Some substances are safe to taste in the lab.

____ 2. Different atoms make up compounds

____ 3. Water is an element.

____ 4. There are more elements than compounds,

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

____ 5. What does the following symbol represent? 

a. oxidizing material
b. flammable and combustible material
c. compressed gas
d. oxidizing material

____ 6. What does the following symbol represent? 

a. dangerously reactive material
b. corrosive material
c. compressed gas
d. flammable and combustible material

____ 7. Which of the following lists of properties is characteristic of metals?

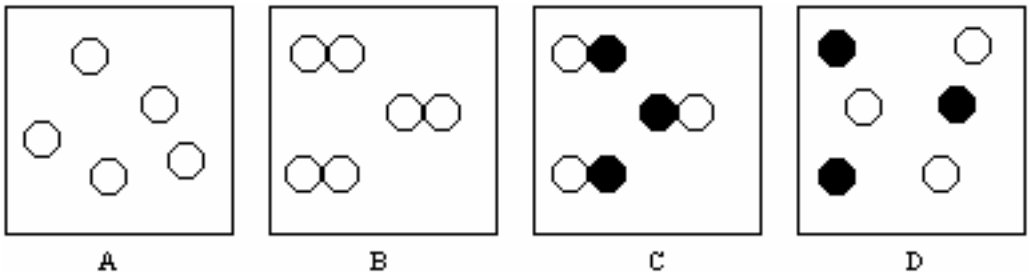
a. Shiny, brittle, conduct heat and electricity.
b. Shiny, bendable, conduct heat and electricity.
c. Shiny, bendable, do not conduct heat and electricity.
d. Shiny, bendable, conduct heat but not electricity.

____ 8. Air is classified as a mixture because

a. it is clear and colourless.
b. it contains at least two different types of particles.
c. its composition never changes.
d. its major components are elements.

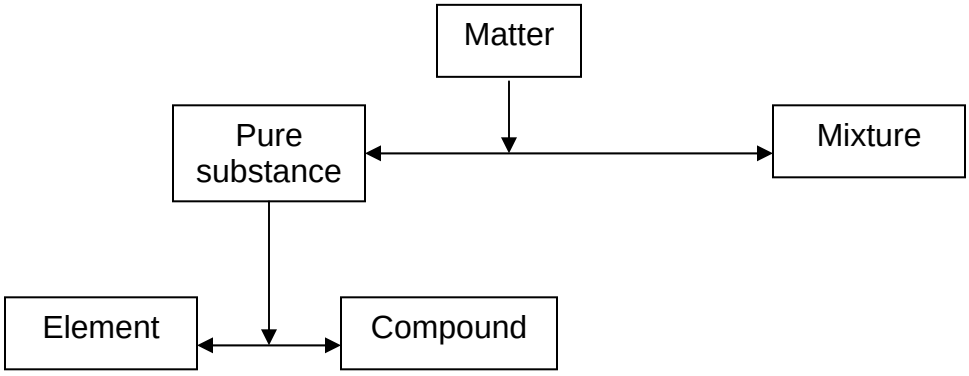
9. In the following diagrams, the empty and filled circles represent atoms. Which diagram most likely represents:

   a. a compound that is a gas?
   b. a mixture of gases?
   c. hydrogen gas, H_2?
   d. neon gas, Ne?



Reflection Activity: Unit 1 Lesson 1

Take a look at some of the substances around you. These might include a plastic pen, aluminum pop can, paper, air, or bottled water. See if you can come up with two examples of each word in the diagram below.



.
.