

Activity 3 (5th Grade)—ENVIRONMENTAL CHEMISTRY Follow-up Activities

In the 3rd science workshop we examined **CHEMICAL AND PHYSICAL PROPERTIES** of white powder samples from a “pretend” Hazardous Materials (HazMat) drill.

PHYSICAL CHARACTERISTICS OF SUBSTANCES

1) Arrange these substances in **particle size** order from smallest to largest:

salt, marbles, baking soda. 1) _____, 2) _____, 3) _____

2) If you were a candy maker, what **color** would you add to your candy so people would know that it tasted like strawberries *without* having to taste it? **Add** _____

...like limes? **Add** _____ ...like lemons? **Add** _____.

STATES OF MATTER AND SOLUBILITY

1) What **state of matter** is a frozen Popsicle? _____

2) What **state of matter** is iced tea? _____

3) What **state of matter** is the air inside a balloon? _____

4) Is powdered drink mix **soluble** or **insoluble** in water? _____

5) Is sand **soluble** or **insoluble** in water? _____

CHEMICAL REACTIVITY OF SUBSTANCES	Acidic	Neutral	Basic
	Pink ← ← ← Purple → → → Blue		

1) If a few drops of **purple pH indicator** are mixed with a few drops of milk and the solution stays **purple**, is milk acidic, basic, or neutral? _____

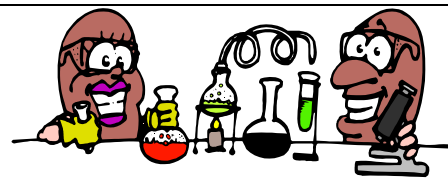
2) If a few drops of **purple pH indicator** are mixed with a few drops of lemonade and the solution turns **bright pink**, is lemonade acidic, basic, or neutral? _____

3) If a few drops of **purple pH indicator** are mixed with a few drops of clear liquid laundry soap and the solution turns **light blue**, is the laundry soap acidic, basic, or neutral? _____

Vocabulary (match the words and definitions by filling in the blank with the appropriate letter)

A. Molecule	_____ A substance made up of individual molecules or compounds that don't combine or react chemically with one another
B. Atom	_____ One of the three states of matter that has tightly packed atomic particles with a fixed volume and shape
C. Mixture	_____ A substance made of only one kind of atom, like pure gold or a diamond (pure carbon)
D. Solid	_____ Substances made up of different kinds of atoms bonded together, like water, which is formed when hydrogen and oxygen bond together
E. Element	_____ The different types of tiny particles that are the smallest structural building blocks of matter

Professor Betty Butterbean needs help **IDENTIFYING AN UNKNOWN SUBSTANCE**. Using the information in the table below, compare the physical and chemical properties of **Chemicals A, B, C** and **D** to the properties of the **Unknown Substance**. After you have made your observations, help **Betty** by answering the questions.



	<i>TEST/ REAGENT</i>	CHEMICAL A	CHEMICAL B	CHEMICAL C	CHEMICAL D	UNKNOWN SUBSTANCE
PHYSICAL	COLOR	red	white	red	white	red
	PARTICLE SIZE	small	small	small	tiny, tiny	small
	TEXTURE	smooth	gritty	gritty	silky	gritty
CHEMICAL PROPERTIES	HEAT	no reaction	melts and bubbles	melts and turns black	melts and turns black	melts and turns black
	WATER SOLUBILITY TEST	turns red, easily dissolves (soluble)	does not dissolve (insoluble)	turns red, dissolves a little (partially soluble)	cloudy, dissolves a little (partially soluble)	turns red, dissolves a little (partially soluble)
	ACETIC ACID	fizzes and bubbles	no reaction	no reaction	no reaction	no reaction
	IODINE SOLUTION	turns into a black liquid	turns into a black liquid	turns into a clear orange liquid	turns into a clear orange liquid	turns into a clear orange liquid
	pH INDICATOR	purple (neutral)	bright pink (strong acid)	pale pink (weak acid)	bright blue (strong base)	pale pink (weak acid)

WHAT CHEMICAL IS THE UNKNOWN SUBSTANCE?

(circle your answer)

A B C D

How did you determine this?

