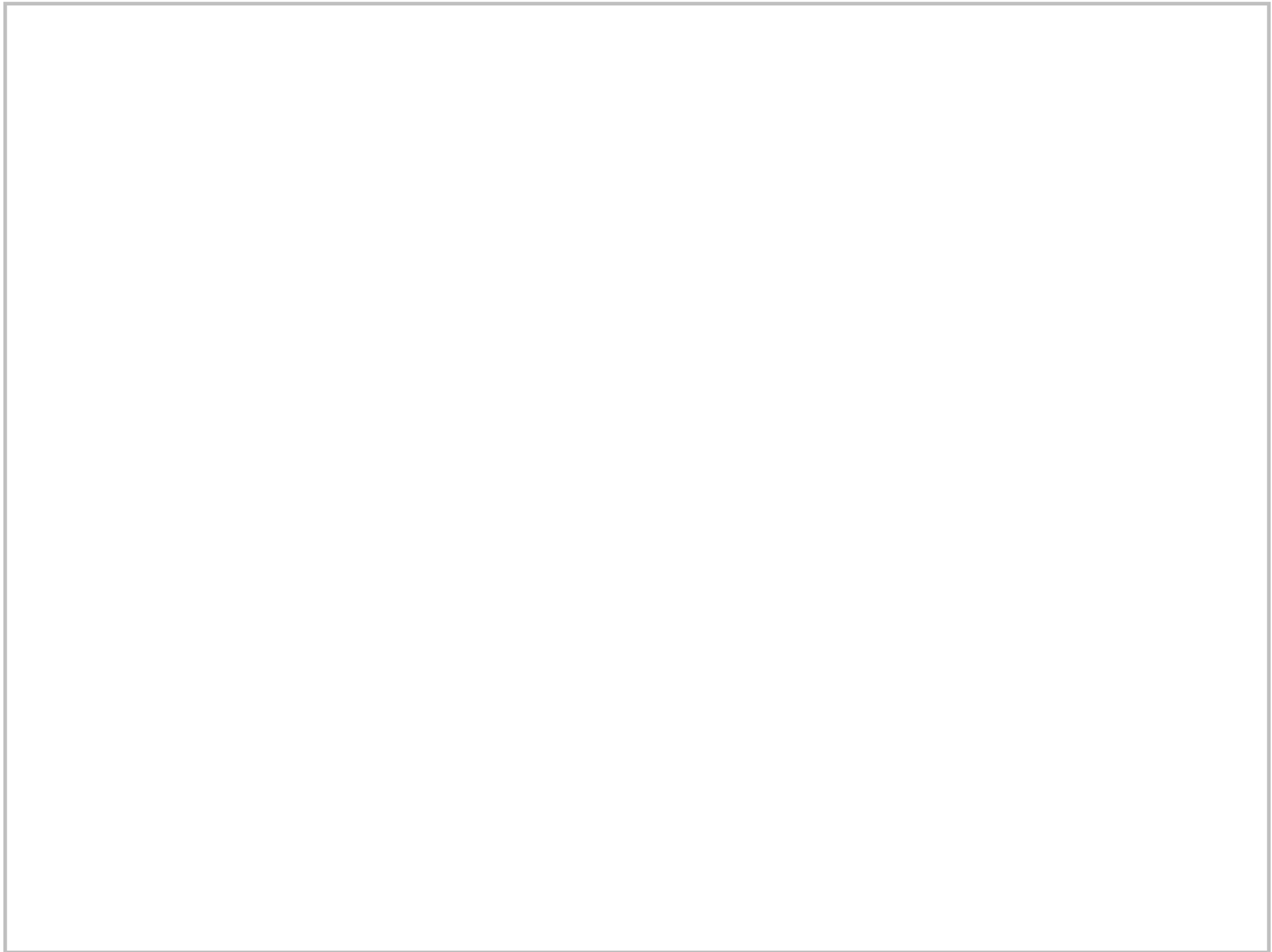


# Chapter 1 Matter and Change

What is Chemistry?

Chemistry is:



## MIXED REVIEW

**SHORT ANSWER** Answer the following questions in the space provided.

1. Classify each of the following as a *homogeneous* or *heterogeneous* substance.

\_\_\_\_\_ a. sugar

\_\_\_\_\_ d. plastic wrap

\_\_\_\_\_ b. iron filings

\_\_\_\_\_ e. cement sidewalk

\_\_\_\_\_ c. granola bar

2. For each type of investigation, select the most appropriate branch of chemistry from the following choices: *organic chemistry*, *analytical chemistry*, *biochemistry*, *theoretical chemistry*. More than one branch may be appropriate.

\_\_\_\_\_ a. A forensic scientist uses chemistry to find

# **Branches of Chemistry**

Organic Chemistry:

Inorganic Chemistry

Physical Chemistry

Analytical Chemistry:

Biochemistry:

Theoretical Chemistry:

Define Chemical:

Examples:

A pure substance is either a \_\_\_\_\_ or a  
\_\_\_\_\_

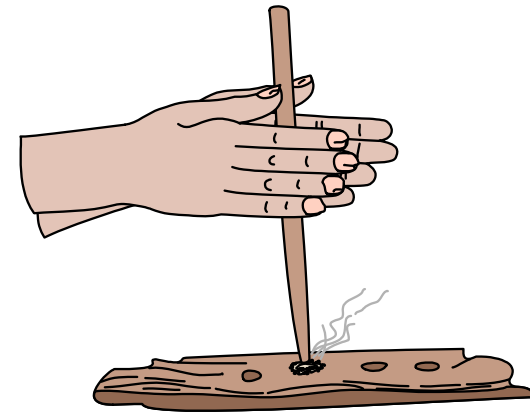
# Classifying Scientific Pursuits

Basic research:

Applied research:

Technology:

# Thinking Skills



A Lost Child Keeping Warm Once upon a time a small child became lost. Because the weather was cold, he decided to gather material for a fire. As he brought objects back to his campfire, he discovered that some of them burned and some of them didn't burn.

To avoid collecting useless substances, the child began to keep track of those objects that burned and those that did not.

This procedure is one of the elementary logical thought processes by which information is systematized. It is called **inductive reasoning** (*a general rule is framed on the basis of a collection of individual observations (or facts)*). He proposed a possible "generalization."

Perhaps Cylindrical Objects Burn

## Chapter 1 Matter and Change

# What Is Chemistry?

Define Chemistry:

“Cylindrical Objects Burn”

**WILL BURN**

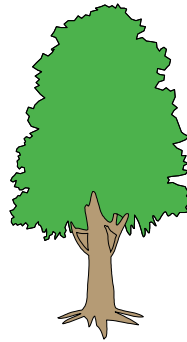
**Tree limbs**

**Broom handles**

**Pencils**

**Chair legs**

**Flagpoles**



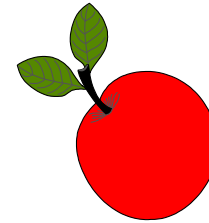
**WON'T BURN**

**Rocks Apples**

**Blackberries**

**Marbles**

**Paperweights**



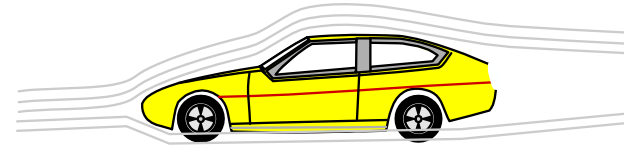
Using his generalization, the boy gathered more substances to burn.

He collected three pieces of pipe, two ginger ale bottles, and the axle from an old car, while leaving a huge cardboard box and newspapers.

During the long cold night that followed he drew ~~the~~ **conclusions**:

- (1) *The cylindrical shape of a burnable object **may not be** intimately associated with its flammability after all.*
- (2) *Even though the “cylindrical” rule is no longer useful, tree limbs, broom handles, pencils, and other burnables still burn*
- (3) *He’d better bring the list along tomorrow.*

New idea: Perhaps **“Wooden objects burn.”**



# Dow Chemical Commercial



## The Study of Chemistry will sharpen your

### *Job Skills for the Future*

- Evaluate and Analyze
  - Think Critically
  - Solve Math Problems
  - Organize and Use References
  - Synthesize Ideas
  - Apply Ideas to New Areas
  - Be Creative
  - Make Decisions with Incomplete Information
- 
- Communicate in Many Modes Chemistry will develop ALL of these skills in YOU

## Matter and Its Properties

Mass of deflated balloon \_\_\_\_\_

Mass of inflated balloon \_\_\_\_\_

Volume:

Mass:

Matter:

An atom is the:

An element is a pure substance that:

A compound is a substance that CAN be broken  
down into simpler substances. Each compound is:

Extensive properties:

Intensive properties:

Physical properties:

Examples

Physical Change:

Examples:

A change of state:

States of matter:

In the solid state:

In the liquid state:

In the gas state

Plasma is a high temperature physical state of matter  
in which:

Examples:

## Chemical Properties and Chemical Changes

A chemical property:

A change in which one or more substances are converted into different substances is called a:

The reactants are:

The products are:

Example:

Evidence of chemical change can include

- 1.
- 2.
- 3.
- 4.
- 5.

Words used to describe chemical properties:

## Energy + Changes in Matter

Energy is always involved when:

Energy can be in various forms: \_\_\_\_\_ , \_\_\_\_\_

Energy can be \_\_\_\_\_ or released in a change, it is not destroyed or created

This is the Law of:

## Classification of Matter

A mixture is a blend of two or more:

mixed together \_\_\_\_\_  
can usually \_\_\_\_\_

Homogeneous mixtures are called \_\_\_\_\_  
uniform in composition ( )

Heterogeneous mixtures  
\_\_\_\_\_ uniform in composition ( )

## Pure Substances

A pure \_\_\_\_\_ has a \_\_\_\_\_ composition

Pure substances are either \_\_\_\_\_ or \_\_\_\_\_

Substances differ from a mixture as every sample of a pure substance has the same \_\_\_\_\_  
\_\_\_\_\_ and the same \_\_\_\_\_

Example water is always :

## Introduction to the Periodic Table

The vertical columns of the periodic table are called \_\_\_\_\_ or \_\_\_\_\_

Each group contains:

The horizontal rows of the elements in the periodic table are called \_\_\_\_\_

Physical and chemical properties change:

## Types of Elements

### Metals

A metal is an element:

properties of metals

most are \_\_\_\_\_ at room temperature

\_\_\_\_\_ they can be hammered or

rolled into thin sheets

\_\_\_\_\_ they can be drawn into a thin wire

\_\_\_\_\_ electricity well

## Nonmetals

A \_\_\_\_\_ is an element that is a \_\_\_\_\_  
of heat and electricity

properties of nonmetals

many are \_\_\_\_\_

non metal solids are \_\_\_\_\_

\_\_\_\_\_ conductors of heat and \_\_\_\_\_



## Metalloids

A \_\_\_\_\_ is an element tht has some characteristics of \_\_\_\_\_ and some characteristics of \_\_\_\_\_

properties of metalloids

all metalloids are \_\_\_\_\_ at room temp  
\_\_\_\_\_ of electricity

## Noble Gases

Elements of \_\_\_\_\_ of the periodic table  
properties of noble gases  
generally \_\_\_\_\_  
\_\_\_\_\_ at room temperature