

Introduction

- 1) Chemistry is the study of matter and the change that matter undergoes.
- 2) Matter is anything that has mass and occupies space.
- 3) Why chemistry?
 - Because living and nonliving things are made of matter. Chemistry affects all aspects of life and most natural events.
 - Careers
 - Informed Citizens.
- 4) **Activity – Solid or Liquid pg 6**

Rd: pgs 7-11

Scientific Method

1) Antoine-Laurent Lavoisier – transformed science from observation to measurement. Thought of as the father of modern science (chemistry).

2) **Activity - Sand/Salt/Iron Separation**

3) Scientific Method – logical, systematic approach to solve a problem.

- Problem/Question – What are you trying to figure out?
 - Observation – information that you obtain through your senses.
 - Background Research
- Hypothesis – proposed answer to your question.
 - (If...then... statement)
- Experiment
 - Materials/Procedure
 - Variables
 - Manipulated Variable (independent) – variable you alter.
 - Responding Variable (dependent) – variable you observe.
 - Control – Variables you keep the same during the experiment. All other variables should be the control.
 - Data Collection (tables)
- Analysis – What is your data telling you?
 - Tables/Graphs
- Discussion – Talk about your data.
 - Possible errors.
 - Possible improvements.
- Conclusion – What was the answer found.
 - Did the conclusion support the hypothesis?

4) Non linear fashion of the scientific method Diagram.

Rd: pgs 20-25

HW: #1

Experimentation

- 1) Terms (discussed on the activity)
 - Control – what stays the same and is compared to in the exp.
 - Variable – what things you change during an experiment. One at a time.
- 2) Communicating scientific findings.
 - Collaboration.
- 3) Appropriate sample sizes and trials.
 - Replication of findings.
- 4) Graphing (label axis, appropriate numbering)
- 5) Lab – The Big Ahah!**
- 6) Alternative interpretations of your data.
- 7) Safety hazards identification. Safe/unsafe procedures.
 - Glassware orientation.
 - MSDS introduction.

Rd: none

HW: #2, #3

Matter & Change

1) Physical change – when composition doesn't change but substances has a different quality or condition. It looks different. Water's states.

Reversible or irreversible.

- Solid – definite shape and volume
- Liquid – indefinite shape and definite volume
- Gas – indefinite shape and volume.
- Vapor – when a substance that is usually a liquid at room temperature is forced to be a gas.
 - i.e. steam

2) Mixtures – physical blend of 2 or more compounds

- Heterogeneous – composition is not uniform
 - i.e. Italian dressing
- Homogeneous (solution) – composition is uniform
 - i.e. salt water

3) Element – simplest form of matter that has a unique set of properties.

4) Compound – substance that contains 2 or more elements chemically combined with fixed properties. Can be broken down by chemical means.

5) Chemical change – produces matter with a different composition than the original matter.

- Chemical change = chemical reaction (reactant/product)

6) Signs of a chemical reaction

- Formation of a precipitate (solid that forms or settles out of a liquid mixture)
- Evolution of a gas (be careful boiling water)
- Color changes
- Absorption or release of heat

7) Law of conservation of mass – mass is neither created nor destroyed

- Probably the most important concept in chemistry.

8) Identify unknowns with the reference sheets.

9) **Activity – Physical/Chemical Properties and Changes (Slime)**

Rd: pgs 39-55

HW: #4-7

Measurement

- 1) Measurement – quantity including a number and a unit
- 2) Scientific notation – way of writing small and large numbers more easily
 - Examples of conversion every way.
 - Stair-step method.
 - Explanation of use.
- 3) Percent error = $|\text{exp. value} - \text{accepted value}| / \text{accepted value} * 100$
 - Percent error is used to determine how far your answer is from the real value.
- 4) Brief review of SI units
 - Length – meter
 - Mass – kilogram
 - Temperature – Kelvin (usually stated Celsius)
 - Time – second
 - Amount of substance – mole
- 5) **Activity – Measurement**
- 6) $K = C^{\circ} + 273$
- 7) Absolute zero – temperature where all motion of matter stops. Never been reached but they've come close.
- 8) Intro to dimensional analysis
- 9) Conversion problems (many book examples)
- 10) Density = mass/volume g/cubic centimeter(ml) (examples) (Use the reference sheet.)
- 11) Density generally decreases as temperature increases

Rd: pgs 63-65, 73-85, 89-91

HW: #8-15