Herbert Morrison Technical High School
Chemistry Syllabus
Grade 7

Unit 1: Introduction to Science

General Objectives

Students should:

1) understand the meaning of science
2) understand that safety precautions are necessary in exploring the environment
3) be aware of the usefulness of working in a scientific manner in problem solving
4) begin using the skills and thinking processes associated with the practice of science
5) be aware that both the senses and instruments can be used to explore the environment
6) appreciate the range and limitations of what can be observed with the senses only

1.1 Science and the Scientist

Specific Objectives

Students should be able to:

a) give a definition for science
b) list the broad areas in science (Biology, Chemistry and Physics)
c) give a definition for chemistry (Chemistry is the study of matter and its interactions in nature)
d) list specific areas in chemistry
e) define each area in chemistry listed in objective 1.1d)
f) name some local and international chemists
g) describe the work of one local chemist (graded assignment)

1.2 Safety Precautions in exploring the Environment

Specific Objectives

Students should be able to:

a) recall laboratory safety rules specific to the chemistry laboratory
b) distinguish between a safe and unsafe chemistry laboratory
c) outline some safety rules which should be observed at home when exploring chemistry (disposal of metals and batteries, bathroom cleaners, clothes care)
d) outline the aims of first aid in the chemistry laboratory
   - use of first aid apparatus (emergency shower, eyewash station, fire extinguisher, fume hood/cupboard)
   - water and safe reagents
   - techniques used for chemical poisoning

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1.3 The Scientific Method

Specific Objectives

Students should be able to:

a) name and draw various laboratory apparatus associated with the chemistry laboratory
b) draw and label a diagram of the Bunsen burner
c) light and use a Bunsen burner
   - steps for lighting
   - types of flame and the characteristics of each
   - draw flames
d) describe the scientific method (hypothesizing, experimenting, control variables, recording, concluding, redesigning if necessary and communicating results) Note that scientists observe, experiment, measure, record results, interpret results and share findings.
e) investigate a few problems using the scientific method (Relate problems to everyday life.)
f) write laboratory reports specific to each of the skills
   - Observation/Reporting/Recording (ORR)
   - Analysis and Interpretation (AI)
   - Manipulation and Measurement (MM)
   - Planning and Designing (PD)

Unit 2: Non-living Things

General Objectives

Students should demonstrate:

1) an understanding of the theory that matter is particulate in nature
2) an understanding that matter can be classified in a number of states; the three most common being solid, liquid and gas
3) an understanding of the process involved in a change of state of matter
4) an understanding that the water cycle is a natural demonstration of changes of state

2. States of Matter

Specific Objectives

Students should be able to:

a) define matter as anything that has mass and occupies space
b) cite evidence that matter consists of tiny particles
c) define the term diffusion
d) classify substances as solids, liquids and gases

e) distinguish among the three states of matter in terms of kinetic energy, arrangement of particles and volume
f) describe what happens in change of state
g) perform experiments to investigate changes of state

Unit 3: Atoms, Elements and Mixtures

General Objectives
Students should:

1) be familiar with the concept of atoms as the building block of matter
2) understand the features which characterize metals and non-metals
3) appreciate the relationship between metals and non-metals and their uses
4) be familiar with the composition of certain materials and develop the ability to make reasoned choices concerning their uses

3.1 Atoms and Elements

Specific Objectives
Students should be able to:

a) define the terms atom and element
b) draw and label diagram of the structure of an atom
c) list the subatomic particles and their properties (relative mass, relative charge, location/position in the atom)
d) list the first twenty elements of the Periodic table (names, symbols, numbers of protons, electrons and neutrons)
e) classify the first twenty elements as metals and non-metals and as solids, liquids and gases
f) identify elements (of the first twenty elements) in everyday compounds
g) explain the relationship among atoms, elements and mixtures
(Make reference to physical and chemical changes in terms of permanence.)

3.2 Mixtures

Specific Objectives
Students should be able to:

a) define mixture as a physical combination of elements or compounds
b) give examples of mixtures
c) list the steps for filtration
d) define the terms soluble, insoluble, filtrate and residue
e) perform experiment to obtain pure water from muddy water and salt from sea water
(Students should be able to properly fold filter paper for use in filtration.)