Name _____ Class _____ Date _____

1 INTRODUCTION TO CHEMISTRY

PRACTICE PROBLEMS

In your notebook, solve the following problems.

SECTION 1.1 CHEMISTRY

1. Look over this list of chemicals and decide whether they belong in organic chemistry, inorganic chemistry, or biochemistry.

a. Sulfuric acid, H_2SO_4

b. Methane, CH_4

c. Water, H_2O

d. Ammonia, NH_3

e. Aspirin, $C_9H_8O_4$

f. Rubbing alcohol, C_3H_7OH

g. Formaldehyde, CH_2O

h. Novocaine, $C_{13}H_{20}N_2O_2$

i. Vanillin, $C_8H_8O_3$

j. Vitamin A, $C_{20}H_{30}O$

2. Match the project to the appropriate field of chemistry (Inorganic Chemistry, Organic Chemistry, Biochemistry, Analytical Chemistry, or Physical Chemistry).

a. Determine the composition of a moon rock sample.

b. Do research on making a new medicine for high blood pressure.

c. Investigate chemical methods for regulating the rate of gasoline burning in an automobile engine.

d. Develop a biodegradable plastic.

e. Work on improving the method for making stainless steel.

3. Classify the following examples as an activity of science or of technology.

a. using a computer

b. driving an automobile

c. determining the pH of a swimming pool

d. analyzing creek water for pollution

e. dry cleaning a suit

SECTION 1.2 CHEMISTRY FAR AND WIDE

1. Identify 3 areas of energy research that scientists are working on today.

2. The following statements are all concerned with the things chemists work on and the chemistry of our everyday world. Write T for each *true* statement and F for each *false* statement.

a. The ozone layer protects Earth from the sun's harmful ultraviolet rays.

b. Chemists explained why the ozone layer was becoming depleted.

c. Carbon dioxide, CO_2, is destroying the ozone layer.

d. The most abundant pollutant generated by humans is carbon dioxide.

e. Sulfur compounds cannot be removed from the gas emitted from power plants and factories.

f. Gaseous sulfur compounds are components of acid rain.

g. Chemists are doing research to improve batteries.

h. Through biotechnology, sheep and cattle have been successfully cloned.

i. Chemists are working to create more productive and blight-resistant plants.

SECTION 1.3 THINKING LIKE A SCIENTIST

1. One cold morning your car does not start. Make two or three hypotheses about why the car will not start.

2. Suppose you try several experiments with your car. You try a battery jump, which does not work. There seems to be enough gas in the car. You wiggle a wire in the engine, and the car starts on the next try. Why can you now form a theory about why the car did not start?

3. The following is a list of observations from everyday experiences:

Hummingbirds have long beaks.
Moisture forms on the outside of a cold glass.
Ice cubes float.
Oil and water don't mix.
There are fewer fish in the creek this year.

a. Propose one hypothesis for each observation.

b. Select one of the hypotheses and describe the experiment(s) that you would perform to test it.

4. Discuss/Comment on the statement: “No theory is written in stone.”

SECTION 1.4 HOW TO STUDY CHEMISTRY

1. List at least 5 things the textbook suggests you should do to make learning chemistry more meaningful.

2. Why does the textbook have photographs, illustrations, tables, and graphs?

3. What is ChemASAP?