Chemistry Name: _____

Section _____ INTRO TO CHEM KEY Date: _____

Chapter 1: Introduction to Chemistry Note Taking Guide

This worksheet is meant to help us learn some of the basic terms and concepts of chemistry.

Chemistry: the study of matter, its composition, and its changes.

When studying chemistry, learn to think about: matter at its atomic and molecular level.

Substance: has a constant composition and constant properties throughout a given sample, and from sample to sample. (Includes elements and compounds.)

Chemistry and Matter

Matter: anything that has mass and takes up space.

Mass: a measurement that reflects the amount of matter.

Weight: the effect of Earth's gravitational pull on a mass.

Models: visual, verbal, or mathematical explanations of experimental data.

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Scientific Method (Scientific Inquiry)

Proposed by Sir Francis Bacon and advocated by Robert Boyle's assertion of meticulous experimentation.

Purpose: a statement of the problem (or an area of interest).

Hypothesis: a tentative explanation (Molina and Rowland).

Experimentation: controlled observations that test a hypothesis.

Independent variable: chosen to be changed systematically by the experiment.

Dependent variable: measured response to changes in the independent variable.

Control: baseline or standard for comparison of changes in the dependent variable.

Observation (Purpose or Problem):

Qualitative: sensory or descriptive data or information.

Quantitative: numerical data or information (Antoine Lavoisier).

Analysis: determination of the results of the experiment (including weaknesses in the data collection or instrumentation) and decisions regarding the next actions to take.

Results: the product of the analysis including any mathematical determinations – the results should not include any deductions.

Conclusion: a deduction based on the evidence in an experiment (empirical, therefore not proven).

Reporting (peer review): allows other scientists to evaluate the findings for themselves. It also allows other researchers to confirm the results.

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Compare theory and scientific law to a hypothesis:

Theory: an explanation of a natural phenomenon (based on many observations over time)

Scientific Law: a relationship in nature that has been supported by many experiments (and agreed by peer review to be a useful model)

Scientific Research

Pure Research: gain knowledge for its own sake

(e.g., Molina and Rowland)

Applied Research: solve a specific problem

(e.g., replacements for CFCs)

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