Newman Catholic High School Chemistry

Syllabus of Target Expectations and Vocabulary for College Preparatory Chemistry

Chapter 2: Measurements and Calculations

I understand that science collects and analyzes data in order to explain and predict what happens in our world.

Target 02-01: Analyze and interpret data and mathematical relationships.

- 02-01 a. Make a standard line of best fit (scatter plot) graph that includes the slope bracket and calculations for slope.
- 02-01 b. Determine if a graph indicates an inversely proportional or a directly proportional relationship between the variables.
- 02-01 c. Use percent discrepancy to evaluate data for accuracy.
- 02-01 d. Use a graph relationship to identify a chemical.
- 02-01 e. Use laboratory data to determine the density of a material.

Target 02-02: Use the science and engineering practices.

- 02-02 a. Apply the science and engineering practices to a lab situation.
- 02-02 b. Classify topics as hypotheses, scientific laws, scientific theories, and models.
- 02-02 c. Make qualitative and quantitative observations.

Target 02-03: Collect quantitative and qualitative data with accuracy and precision.

- 02-03 a. Distinguish between accuracy and precision.
- 02-03 b. Determine the number of significant digits in a measurement.
- 02-03 c. Measure and represent the answer with the correct number of significant digits.
- 02-03 d. Perform addition and subtraction calculations and give an answer with the correct number of significant digits.
- 02-03 e. Perform multiplication and division calculations and give an answer with the correct number of significant digits.
- 02-03 f. Express numbers in scientific notation and write standard notation for numbers expressed in scientific notation.
- 02-03 g. Use descriptive vocabulary to describe a material or change.

Target 02-04: Use dimensional analysis to solve chemistry problems.

- 02-04 a. Transform a statement of equality into a conversion factor.
- 02-04 b. Use conversion factors and dimensional analysis to convert from one SI unit to another.
- 02-04 c. Use dimensional analysis to solve problems.

Vocabulary:

scientific method	quantitative	scientific notation	directly proportional
system	quantity	conversion factor	inversely proportional
hypothesis	weight	dimensional analysis	SI
model	derived unit	accuracy	scientific law
scientific theory	volume	precision	
observing	density	percentage error	
qualitative	mass	significant figures	

Assignments:

Book notes and Vocabulary

Text: Davis, Robert E. and Mickey Sarquis. Modern Chemistry. Austin: Holt, Rinehart and Winston. © 2009. Chapter 2: pp. 28-65

Solving Problems in Chemistry (SPIC) Chapter 2 Measuring and Calculating - 2:1 SI, 2:2 Significant Digits, 2:3 Rounding and Significant Digits in Calculations, 2:4 Derived Units, 2:5 Conversion Factors, 2:6 Problem Solving -- Factor Label Method, 2:7 Scientific Notation, 2:8 Density.

Concept Review Guides

CR 2:1 Scientific Method

Addison Wesley Reteach 2 Scientific Measurement

2.2 Accuracy and Precision

2.3 Scientific Notation

2:4 Significant Figures in Measurements

2:5 Significant Figures in Calculations

Addison Wesley 2AEPP Significant Figures and Uncertainty

Problem Solving Strategies

CRYSTAL Dimensional Analysis with cards

Worksheets 2.15 and 2.17 Dimensional Analysis

Quiz

Ions of Families IA, IIA, IIIA,VIA, and VIIA

Labs:

Black Box (Obscertainer Boxes)

All Bent Out of Shape (Quantify the relationship between mass and volume)

Next Generation Science Standards (NGSS)

SEP.1 Asking questions and defining problems

SEP.3 Plan and carry out investigations

SEP.4 Analyze and interpret data

SEP.5 Use mathematics and computational thinking

SEP.6 Construct explanations and design solutions

WHST.9-12.5 Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach,, focusing on addressing what is most significant for a specific purpose and audience (HS-PS1-2).

MP.2 Reason abstractly and quantitatively. (HS-PS1-5), (HS-PS1-7)

MP.4 Model with mathematics. (HS-PS1-4), (HS-PS1-8)

HSN-Q.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

HSN.Q.A.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

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