

Subject: Science

Grade: 11 Chemistry 2

Hallsville R-IV High School

Chemistry 2

[Rationale](#) | [Course Description](#)

Curriculum Strands

- [Matter and Energy](#)
- Force and Motion
- Living Organisms
- Ecology/Environments
- Earth Systems
- Universe
- [Scientific Inquiry](#)
- [Impact of Science, Technology and Human Activity](#)

Chemistry 2 Rationale:

The advanced study of chemistry will enhance the scientific and mathematical thought processes of the student while preparing them for various technological opportunities they can take advantage of through out life.

Chemistry 2 Course Description:

Grade 11-12 1 unit

This class furthers the development of general principles and concepts of chemistry. Students will study topics including atoms, the periodic chart, molarity, different types of chemical reactions, stoichiometry of reactions, acid-base chemistry, oxidation-reduction chemistry, organic chemistry, nuclear chemistry, thermochemistry, and the gas laws. This class is laboratory intensive Prerequisite course is Chemistry and Algebra I.

Concept: Matter and Energy

[top](#)**Topic Objective:**

Strand 1.1: Properties and Principles of Matter and Energy - All students will demonstrate proficiency in the knowledge that changes in properties and states of matter provide evidence of the atomic theory of matter.

Measurable Learner Objectives	Process	Content	GLE's	Integrated Skills	Suggested Activities	Suggested Assessments/Tools
<p>1A. Predict the effect of the properties of the solvent or solute (e.g., polarity, temperature, surface area/particle size, concentration, agitation) on the solubility of a substance.</p> <p>1B. Using the Kinetic Theory model, explain the changes that occur in the distance between atoms/molecules and temperature of a substance as energy is absorbed or released during a phase change.</p> <p>1C. Predict the reaction rates of different substances based on their properties (i.e., concentrations of reactants, pressure, temperature, state of matter, surface area, type of reactant material)</p> <p>1D. Identify the consequences of different types of reactions (i.e., oxidation/reduction reactions such as</p>	<p>1.2</p> <p>3.1</p> <p>3.2</p>	SC 1			<p>1A PH Lab # 50 - Solubility Rules:</p> <p>1B PH Lab # 41 - Changes of State: Examine the boiling point and melting point of various compounds.</p> <p>1B Notes and Discussion - Phase Change Diagrams:</p> <p>1C PH Lab # 47 - Reaction Rates and Equilibrium: Examine speed of various reactions and the extent to which they reach equilibrium.</p> <p>1C Notes and Discussion - Equilibrium and Le Chatelier's Principle:</p> <p>1D PH Lab # 52 - Properties of Acids and Bases: Observe the properties of various acids and bases.</p>	<p>1A Laboratory Review # 50: (Scoring Guide)</p> <p>1A - C Comprehension Test: (Scoring Guide)</p> <p>1B Laboratory Review # 41: (Scoring Guide)</p> <p>1C Laboratory Review # 47: (Scoring Guide)</p> <p>1D Laboratory Review # 52: (Scoring Guide)</p>

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combustion, acid/base reactions) to humans and human activity.						
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Resources:

Prentice Hall (PH)
Laboratory Review - Calculations, Graphing, Critical thinking, Analysis Questions

Instructional Methods:

Enrichment/ Special Needs:

+Key to Integrated Skills

DS = Disability Equity
C = Character Education
E = Gender Equity
D = Cultural Diversity

R = Research Skills
W = Workplace Skills
T = Technology Skills

Concept: Scientific Inquiry

[top](#)**Topic Objective:**

Strand 7.1 Scientific Inquiry - All students will demonstrate proficiency in the knowledge that science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.

Measurable Learner Objectives	Process	Content	GLE's	Integrated Skills	Suggested Activities	Suggested Assessments/Tools
<p>1A. Formulate testable questions and hypotheses.</p> <p>1B. Analyzing an experiment, identify the components (i.e., independent variable, dependent variable, control of constants, multiple trials) and explain their importance to the design of a valid experiment.</p> <p>1C. Design and conduct a valid experiment.</p> <p>1D. Evaluate the design of an experiment and make suggestions for reasonable improvements.</p> <p>1E. Make qualitative and quantitative observations using the appropriate senses, tools, and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders)</p>	<p>1.6</p> <p>1.7</p>	SC 7			<p>1A - D Calorimetry Lab:</p> <p>1E - M Laboratory Exercise - Measuring:</p> <p>1N - P Performed as a part of ALL laboratory exercises.</p>	1A - P Laboratory Review: (Scoring Guide)

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Measurable Learner Objectives	Process	Content	GLE's	Integrated Skills	Suggested Activities	Suggested Assessments/Tools
<p>1F. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second.</p> <p>1G. Determine the appropriate tools and techniques to collect, analyze, and interpret data.</p> <p>1H. Judge whether measurements and computations of quantities are reasonable.</p> <p>1I. Calculate the range, average/mean, percent, and ratio for sets of data.</p> <p>1J. Recognize observation is biased by the experiences and knowledge of the observer (e.g., strong beliefs about what should happen in particular circumstances can prevent the detection of other results).</p> <p>1K. Use quantitative and qualitative data as support for reasonable explanations (conclusions).</p>						

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Measurable Learner Objectives	Process	Content	GLE's	Integrated Skills	Suggested Activities	Suggested Assessments/Tools
<p>1L. Analyze experimental data to determine patterns, relationships, perspectives, and credibility of explanations (e.g., predict/extrapolate data, explain the relationship between the independent and dependent variables).</p> <p>1M. Identify the possible effects of errors in observations, measurements, and calculations, on the validity and reliability of data and resultant explanations (conclusions).</p> <p>1N. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories).</p> <p>1O. Evaluate the reasonableness of an explanation (conclusion).</p> <p>1P. Communicate the procedures and results of investigations and explanations through:</p> <ul style="list-style-type: none">* oral presentations* drawings and maps* data tables (allowing for the recording and analysis of data relevant to the experiment such as independent and dependent						

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Measurable Learner Objectives	Process	Content	GLE's	Integrated Skills	Suggested Activities	Suggested Assessments/Tools
variables, multiple trials, beginning and ending times or temperatures, derived quantities) * graphs (bar, single and multiple line) * equations and writings						

Resources:

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Instructional Methods:

Enrichment/ Special Needs:

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Concept: Impact of Science/Human Needs

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Topic Objective:
Strand 8.1: Impact of Science, Technology and Human Activity - All students will demonstrate proficiency in the knowledge that the nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs.

Measurable Learner Objectives	Process	Content	GLE's	Integrated Skills	Suggested Activities	Suggested Assessments/Tools
1A. Recognize the relationships linking technology and science (e.g., how technological problems may create a demand for new science knowledge, how new technologies make it possible for scientists to extend research and advance science) 1B. Identify and evaluate the drawbacks (e.g., design constraints, unintended consequences, risks) and benefits of technological solutions to a given problem (e.g., damming a river for flood control, using pesticides to eliminate mosquitoes, genetic engineering of cells, use of satellite communications to gather information)	3.8	SC 8			1A Discussion - Particle Accelerator: 1B Discussion - Nuclear Waste:	1A, B Discussion Review: (Scoring Guide)

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Resources:

Prentice Hall (PH)
Laboratory Review - Calculations, Graphing, Critical thinking, Analysis
Questions

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Concept: Impact of Science/Society

Topic Objective:

Standard 8.3: Impact of Science, Technology and Human Activity - All students will demonstrate proficiency in the knowledge that science and technology affect, and are affected by, society.

Measurable Learner Objectives	Process	Content	GLE's	Integrated Skills	Suggested Activities	Suggested Assessments/Tools
3A. Analyze the roles of science and society as they interact to determine the direction of scientific and technological progress (e.g., prioritization of and funding for new scientific research and technological development is determined on the basis of individual, political and social values and needs; understanding basic concepts and principles of science and technology influences debate about the economics, policies, politics, and ethics of various scientific and technological challenges)	1.7 3.6 3.8	SC 8			3A - C Discussion and Notes - Nuclear Research: 3A - C Debate - Ethics of Nuclear Research: 3D, E Discussion and Handout - Setting Up the Laboratory Notebook:	3A - C Discussion Review: (Scoring Guide) 3A - C Debate # 1: (Scoring Guide) 3D, E Laboratory Notebook: (Scoring Guide)
3B. Identify and describe major scientific and technological challenges to society and their ramifications for public policy (e.g., global warming, limitations to fossil fuels, genetic engineering of plants, space and/or medical research)						

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Measurable Learner Objectives	Process	Content	GLE's	Integrated Skills	Suggested Activities	Suggested Assessments/Tools
<p>3C. Analyze and evaluate the social, political, economic, ethical, and environmental factors affecting progress toward meeting major scientific and technological challenges (e.g., limitations placed on stem-cell research or genetic engineering, introduction of alien species, deforestation, bioterrorism, nuclear energy, genetic counseling, computer technology)</p> <p>3D. Evaluate a given source for its scientific credibility (e.g., articles in a new periodical quoting an "eye witness", a scientist speaking within or outside his/her area of expertise)</p> <p>3E. Explain why accurate record-keeping, openness, and replication are essential for maintaining an investigator's credibility with other scientists and society.</p>						
<p>Resources:</p> <p>Prentice Hall (PH) Laboratory Review - Calculations, Graphing, Critical thinking, Analysis Questions</p>				<p>Instructional Methods:</p>		

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