

Grade Course	SHS2 ICA	Subject	Chemistry Lecture, Chemistry Laboratory
Class Hours	6 Hours / Week		

Competencies

① Investigation	Students will complete various investigations regarding phenomena in life science. Students will use the scientific method.
② Problem Solving	Investigations regarding real world problems will be posed which students can consider solutions. Considering potential methods of testing and finding solution.
③ Creativity	Consider solutions to problems, create their own investigations, and participate in various activities and projects to express concepts they've learned.

3	Recognize natural phenomena and make connections to material discussed in class.	Apply concepts to real world situations.	Model basic and more complex concepts in elementally creative assessments.
2		Determine methods of experimenting practical for the topics in mind.	
1	Know the meaning of key vocabulary and basic concepts.		Communicate basic concepts in guided creative assessments.
	A Recognition	B Logical Thinking	C Creative Thinking

Term	Month	Unit	Unit Goals	Activities
1	4	Unit 1: Structure and Properties of Matter	HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms. HS-PS1-2. Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles. HS-PS1-4. Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy. HS-PS1-5. Apply scientific principles and evidenced to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs. HS-PS1-6. Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium. HS-PS1-7. Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. HS-PS2-4. Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects. HS-PS2-6. Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed	Student centered, inquiry-based classwork and group work activities and projects, laboratory investigations, various types of assessments.
	5	Module 1: The Central Science		
	6	Module 2: Matter: Properties and Changes Module 3: Structure of the Atom		
	7	Module 4: Electrons in Atoms Module 5: The Periodic Table and Periodic Law		
2	9	Unit 2: Chemical Bonding and Reactions		Student centered, inquiry-based classwork and group work activities and projects, laboratory investigations, various types of assessments.
	10	Module 6: Ionic Compounds and Metals Module 7: Covalent Bonding Module 8: Chemical Reactions Module 9: The Mole Module 10: Stoichiometry		
	11	Unit 3: Matter, Energy and Equilibrium		
	12	Module 11: States of Matter Module 12: Gases Module 13: Mixtures and Solutions		

3	1 2 3	Unit 3: Matter, Energy and Equilibrium Module 14: Energy and Chemical Change Module 15: Reaction Rates Module 16: Chemical Equilibrium Module 17: Acids and Bases	materials. HS-PS3-1. Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the systems are known. HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motion of particle (objects) and energy associated with the relative position of particles (objects). HS-PS3-4. Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics) . HS-PS3-5. Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.	Student centered, inquiry-based classwork and group work activities and projects, laboratory investigations, various types of assessments.
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