Stockton Unified School District

EDISON HIGH SCHOOL

Home of the Vikings

SUSD

Essential Outcomes Chart: What is it we expect students to learn?

GRADE:	10-12	**SUBJECT:**	***Chemistry***	**SEMESTER :**	1 & 2	**TEAM MEMBERS:**	*Corliss, Stelzer, Raya*

Scientific Process Skills: Lab Skills, Measurement, & Units

	STANDARD DESCRIPTION	EXAMPLE RIGOR	PREREQUISITE / CONCURRENT / EXISTING SKILLS	COMMON ASSESSMENT	WHEN TAUGHT ?	EXTENSION STANDARDS
	What is the essential standard to be learned? Describe in student-friendly vocabulary.	**What does proficient student work look like? Provide an example and/or description.**	**What prior / concurrent / existing knowledge, skills, and/or vocabulary is/are needed for a student to master this standard?**	**What assessment(s) will be used to measure student mastery?**	**When will this standard be taught?**	**What will we do when students have learned the essential standard(s)?**
E.O. 1 ***The Scientific Method***	**SEP 1, SEP 4, SEP 5, SEP 6** Students will carry out the steps of the Scientific Method through Investigation & Experimentation including: designing experiments, creating hypotheses, collecting &	**Students can** plan & conduct an investigation individually & collaboratively to produce data to serve as the basis for evidence, in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider	**Common Content Key Terms or Vocabulary for each standard:** • Variable: Independent & Dependent • Hypothesis • Data • Observation • Slope **Academic Vocabulary** • Describe • Compare • Contrast • Differentiate • Explain	**Informal & Formal Assessments** • Student Portfolios & or Interactive Notebooks • CER(Claim, Evidence, Reasoning)/ Summary Paragraphs • Differentiated Critical Reading • GIZMOS Inquiry Labs	**Quarter 1**	**Extension Activities** • Projects that are standard specific • Enrichment activities • Additional Critical Reading / literature readings related to the standard • Virtual Labs • Graph Analysis using **AVID LENSES** • Design a Science Experiment • **CER:** Claim

	analyzing data, then developing conclusions based on the data**.**	limitations on the precision of the data (e.g., number of trials, time), and refine the design accordingly. Engage in trial and error. **Through CER summary paragraphs, experimental design, lab analysis, & process activities.**	• Graphing **Focused note taking** **Paragraph Summaries** • CER Organizer • CER Summary **Differentiated Critical Reading Strategies** **Steps of the Scientific Method** **Metric Measurement using rulers, balances and glassware.** **Conduct /Complete:** • measurement • Data Collection • Data Analysis including finding averages • sources of error • Graph data using various forms of graphs	• Lab Reports • Common Formative Assessments • Common Summative Assessments , • MAP Assessment Results		Evidence & Reasoning Data Analysis • **POGIL:** ***Process-oriented guided-inquiry learning***

E.O. 2 **Measurement & Lab Skills**	**SEP 1, SEP 3, SEP 4, SEP 5** Students can identify the basic units of measurement and be able to determine their values using the appropriate lab equipment in a lab setting Student can convert between varying units of measurement	**Students can** identify the correct units individually & collaboratively to measure data for the basic units of measurement including mass, temperature, length, and volume: decide on types, how much, and accuracy of data needed to produce reliable measurements Students can convert units using dimensional analysis **Through CER summary paragraphs, experimental design, lab analysis, & process activities.**	**Common Content Key Terms or Vocabulary for each standard:** • Mass • Volume • Temperature • Length • Density • Unit • Dimensional Analysis **Academic Vocabulary** • Describe • Compare • Contrast • Differentiate • Explain • Graphing **Focused note taking** **Paragraph Summaries** • CER Organizer • CER Summary • Gizmos • Lab Reports	**Informal & Formal Assessments** • Student Portfolios & or Interactive Notebooks • CER(Claim, Evidence, Reasoning)/Summary Paragraphs • Differentiated Critical Reading • GIZMOS Inquiry Labs • Lab Reports • Common Formative Assessments • Common Summative Assessments		**Extension Activities** • Projects that are standard specific • Enrichment activities • Additional Critical Reading / literature readings related to the standard • Virtual Labs • Graph Analysis using **AVID LENSES** • Design a Science Experiment • **CER:** Claim Evidence & Reasoning Data Analysis • **POGIL:** ***Process-oriented guided-inquiry learning***

Segment 1: Combustion

	STANDARD DESCRIPTION	EXAMPLE RIGOR	PREREQUISITE / CONCURRENT / EXISTING SKILLS	COMMON ASSESSMENT	WHEN TAUGHT ?	EXTENSION STANDARDS

	What is the essential standard to be learned? Describe in student-friendly vocabulary.	What does proficient student work look like? Provide an example and/or description.	What prior / concurrent / existing knowledge, skills, and/or vocabulary is/are needed for a student to master this standard?	What assessment(s) will be used to measure student mastery?	When will this standard be taught?	What will we do when students have learned the essential standard(s)?

E.O. 3
Heat & Combustion
	Standards (NGSS):
	• **HS-PS1-3**
	• **HS-PS1-4**
	• **HS-PS1-7**
	• **HS-PS3-1**
	
	In this brief introductory unit, students investigate the amount of stored chemical potential energy in food They make observations of material properties at the bulk scale that they will later explain at the atomic scale The themes of combustion and CO_2 tie together several of the instructional segments
		Students will observe a calorimetry experiment and utilize the q=mcΔT equation to solve for the amount of heat produced in a system
		
		Students will explain the law of conservation of mass it terms of amounts of reactants and products and apply it to a lab/ phenomena
			Common Content Key Terms or Vocabulary for each standard:
			• Variable: Independent & dependent
			• Hypothesis
			• Data
			• observation
			  • calorie
			  • energy
			  • solid, liquid, and gas
			  • matter
			  • calorimetry
			  • conservation of mass
			
			Academic Vocabulary
			• Describe
			• Compare
			• Contrast
			• Differentiate
			• Explain
			Focused Note taking
			Paragraph Summaries
			• CER Organizer
			• CER Summary
				Informal & Formal Assessments
				• Student Portfolios & or Interactive Notebooks
				• CER/Summary Paragraphs
				• Differentiated Critical Reading
				• GIZMOS Inquiry Labs
				• Lab Reports
				• Common Formative Assessments
				• Common Summative Assessments
				,
					Quarter 1	**Extension Activities**
						• Projects that are standard specific
						• Enrichment activities
						• Additional Critical Reading / literature readings related to the standard
						• Virtual Labs
						• Models
						• **POGIL:** ***Process-oriented guided-inquiry learning***
						• **CER:** Claim Evidence & Reasoning Data Analysis

Essential Guiding Questions

- What is energy, how is it measured, and how does it flow within a system?
- What mechanisms allow us to utilize the energy of our food and fuels?

Segment 2: Heat & Energy in Earth's System

	STANDARD DESCRIPTION	EXAMPLE RIGOR	PREREQUISITE / CONCURRENT / EXISTING SKILLS	COMMON ASSESSMENT	WHEN TAUGHT ?	EXTENSION STANDARDS
	What is the essential standard to be learned? Describe in student-friendly vocabulary.	**What does proficient student work look like? Provide an example and/or description.**	**What prior / concurrent / existing knowledge, skills, and/or vocabulary is/are needed for a student to master this standard?**	**What assessment(s) will be used to measure student mastery?**	**When will this standard be taught?**	**What will we do when students have learned the essential standard(s)?**
E.O. 4 ***Heat***	**HS-PS3-1** **HS-PS3-2** **HS-PS3-4** Students develop models of energy conservation within systems and the mechanisms of heat flow They relate macroscopic heat transport to atomic scale interactions of particles, which they will apply in later units to construct models of interactions between atoms	**Students can** observe how the interaction and speed of particles relates to temperatures and the states of matter **Students can** identify how heat flows in systems and explain how conduction, convection, and radiation occur **Through Models, CER summary paragraphs, lab analysis, & process**	**Common content Key Terms or Vocabulary for each standard** ● States of Matter ● Heat ● Temperature ● Convection, Conduction, Radiation **Academic Language:** ● Describe ● Explain ● Differentiate ● Compare/Contrast **Focused Note taking Paragraph Summaries** ● CER Organizer ● CER Summary	**Informal & Formal Assessments** ● Student Portfolios & or Interactive Notebooks ● CER/Summary Paragraphs ● Differentiated Critical Reading ● GIZMOS Inquiry Labs ● Lab Reports ● Common Formative Assessments ● Common Summative Assessments	**Quarter 1**	**Extension Activities** ● Projects that are standard specific ● Enrichment activities ● Additional Critical Reading / literature readings related to the standard ● Virtual Labs ● Models ● **POGIL:** *Process oriented guided-inquiry learning* ● **CER:** Claim Evidence & Reasoning Data Analysis

		activities.				
E.O. 4 ***Heat in the Earth***	**HS-ESS2-3** **HS-ETS1-4** They use evidence from Earth's surface to infer the heat transport processes at work in the planet's interior	**Students can** explain how convection occurs in earth's interior and relate the microscopic principles to macroscopic phenomena **Through Models, CER summary paragraphs, lab analysis, & process activities.**	**Common content Key Terms or Vocabulary for each standard** ● Mantle ● Crust ● Core ● Earthquake ● Volcano ● Convection Currents **Academic Language:** ● Describe ● Explain ● Differentiate ● Compare/Contrast **Focused Note taking Paragraph Summaries** ● CER Organizer ● CER Summary	**Informal & Formal Assessments** ● Student Portfolios & or Interactive Notebooks ● CER/ Summary Paragraphs ● Differentiated Critical Reading ● GIZMOS Inquiry Labs ● Lab Reports ● Common Formative Assessments ● Common Summative Assessments	**Quarter 1**	**Extension Activities** ● Projects that are standard specific ● Enrichment activities ● Additional Critical Reading / literature readings related to the standard ● Virtual Labs ● Models ● **POGIL:** *Process oriented guided-inquiry learning* ● **CER:** Claim Evidence & Reasoning Data Analysis

Essential Guiding Questions

- **How is energy transferred and conserved?**
- **How can energy be harnessed to perform useful tasks?**

Segment 3: Atoms, Elements, & Molecules

E.O. 5: The Atom	**HS-PS1-1** Students identify the basic components of the atom and model the interior of an atom based on its location in the periodic table	**Students can** explain and model that each atom has a charged substructure consisting of a nucleus, which is made of protons and neutrons, surrounded by electrons. **Through CER summary paragraphs, lab analysis, & process activities.**	**Common content Key Terms or Vocabulary for each standard** ● Molecules ● Elements, ● Atom ● Electron ● Proton ● Neutron ● Atomic number ● Bohr Model ● Isotope ● Mass number ● Atomic mass ● Nuclear reaction ● Radioactivity ● Radiation **Academic Language** ● Model ● Construct ● Revise ● Describe ● Explain ● Differentiate ● Compare/Contrast **Focused Note taking Paragraph Summaries** ● CER Organizer ● CER Summary **Differentiated Critical Reading Strategies**	**Informal & Formal Assessments** ● Student Portfolios &/or Interactive Notebooks ● CER/ Summary Paragraphs ● Differentiated Critical Reading ● Inquiry Labs ● Lab Reports ● Common Formative Assessments ● Common Summative Assessments	**Quarter 2**	**Extension Activities** ● Projects that are standard specific ● Enrichment activities ● Additional Critical Reading / literature readings related to the standard ● Virtual Labs ● Models ● **POGIL:** ***Process-oriented guided-inquiry learning*** ● **CER:** Claim Evidence & Reasoning Data Analysis

E.O. 6: The Periodic Table	**HS-PS1-1** Students recognize patterns in the properties and behavior of elements, as illustrated on the periodic table	**Students can** apply knowledge of the patterns found on the periodic table and use these patterns such as valence electrons to predict the properties of elements, molecules, and compounds **Through CER summary paragraphs, lab analysis, & process activities.**	**Common content Key Terms or Vocabulary for each standard** ● Electronegativity ● Ionization energy ● Octet rule ● Group ● Period ● Periodic law ● Representative element **Academic Language** ● Model ● Construct ● Revise ● Describe ● Explain ● Differentiate ● Compare/Contrast **Focused Note taking Paragraph Summaries** ● CER Organizer ● CER Summary **Differentiated Critical Reading Strategies**	**Informal & Formal Assessments** ● Student Portfolios & or Interactive Notebooks ● CER / Summary Paragraphs, ● GIZMOS Inquiry Labs ● Lab Reports ● Common Formative Assessments ● Common Summative Assessments	**Quarter 2**	**Extension Activities** ● Projects that are standard specific ● Enrichment activities ● Additional Critical Reading / literature readings related to the standard ● Virtual Labs ● Models ● **POGIL:** ***Process-oriented guided-inquiry learning*** ● **CER:** Claim Evidence & Reasoning Data Analysis

E.O. 7: Bonding	**HS-PS1-2** They use these patterns to develop a model of the interior structure of atoms and to predict how different atoms will interact based on their electron configurations	**Students can** explain outcomes of simple chemical reactions based on valence electrons and explain how these bonds create differences in bulk properties. **Through CER summary paragraphs, lab analysis, & process activities.**	**Common content Key Terms or Vocabulary for each standard** ● Anion ● Cation ● Chemical bond ● Lattice energy ● Oxidation number ● Polyatomic ion ● Covalent bond ● Lewis structures ● Molecule ● Polar/non-polar covalent ● Structural formula ● VSEPR model **Academic Language** ● Model ● Construct ● Revise ● Describe ● Explain ● Differentiate ● Compare/Contrast **Focused Note taking Paragraph Summaries** ● CER Organizer ● CER Summary **Differentiated Critical Reading Strategies**	**Informal & Formal Assessments** ● Student Portfolios & or Interactive Notebooks ● CER / Summary Paragraphs, ● GIZMOS Inquiry Labs ● Lab Reports ● Common Formative Assessments ● Common Summative Assessments ●	**Quarter 2**	**Extension Activities** ● Projects that are standard specific ● Enrichment activities ● Additional Critical Reading / literature readings related to the standard ● Virtual Labs ● Models ● **POGIL:** ***Process-oriented guided-inquiry learning*** ● **CER:** Claim Evidence & Reasoning Data Analysis

Essential Guiding Questions

- **What is inside atoms and how does this affect how they interact?**
- **What models can we use to predict the outcomes of chemical reactions?**
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Segment 4: Chemical Reactions

	STANDARD DESCRIPTION	EXAMPLE RIGOR	PREREQUISITE / CONCURRENT / EXISTING SKILLS	COMMON ASSESSMENT	WHEN TAUGHT ?	EXTENSION STANDARDS
	What is the essential standard to be learned? Describe in student-friendly vocabulary.	**What does proficient student work look like? Provide an example and/or description.**	**What prior / concurrent / existing knowledge, skills, and/or vocabulary is/are needed for a student to master this standard?**	**What assessment(s) will be used to measure student mastery?**	**When will this standard be taught?**	**What will we do when students have learned the essential standard(s)?**
E.O. 8 Properties of Compounds	**HS-PS1-3** **HS-PS2-4** **HS-PS3-5** Students refine their models of chemical bonds and chemical reactions They compare the strength of different types of bonds and attractions	**Students can** identify the different types of intermolecular forces and be able to predict their bulk properties based on the strength of interaction between the molecules **Through CER summary paragraphs, lab analysis, and analysis & process activities.**	**Common Content Key Terms or Vocabulary for each standard** ● Polar ● Non Polar ● Intermolecular Forces ● Dipole-dipole ● London dispersion ● ion-dipole ● hydrogen bonding **Academic Language** ● Describe ● Explain ● Differentiate ● Compare/Contrast ● Determine ● Develop **Focused Note taking Paragraph Summaries** ● CER Organizer ● CER Summary	**Informal & Formal Assessments** ● Student Portfolios & or Interactive Notebooks ● CER/ Summary Paragraphs, ● GIZMOS Inquiry Labs ● Lab Reports ● Common Formative Assessments ● Common Summative Assessments	**Quarter 3**	**Extension Activities** ● Projects that are standard specific ● Enrichment activities ● Additional Critical Reading / literature readings related to the standard ● Virtual Labs ● **POGIL:** ***Process-oriented guided-inquiry learning*** ● **CER:** Claim Evidence & Reasoning Data Analysis

E.O. 9 **Reactions**	**HS-PS1-4** **HS-PS1-5** Students develop models of how energy is stored and released in chemical reaction, in addition students learn about the varying types of chemical reactions and how to classify them	**Students can** develop models of how energy flows in a reaction and classify the main types of reactions in order to predict the interactions of main group elements **Through CER summary paragraphs, lab analysis, and analysis & process activities.**	**Common Content Key Terms or Vocabulary for each standard** ● Chemical reaction ● Reactant ● Product ● Chemical equation ● Coefficient ● Endothermic ● Exothermic ● Synthesis ● Combustion ● Decomposition ● Replacement **Academic Vocabulary** ● Describe ● Compare ● Contrast ● Differentiate ● Explain ● Hierarchy **Focused Note taking Paragraph Summaries** ● CER Organizer ● CER Summary	**Informal & Formal Assessments** ● Student Portfolios & or Interactive Notebooks ● CER / Summary Paragraphs, ● GIZMOS Inquiry Labs ● Lab Reports ● Common Formative Assessments ● Common Summative Assessments	**Quarter 3**	**Extension Activities** ● Projects that are standard specific ● Enrichment activities ● Additional Critical Reading / literature readings related to the standard ● Virtual Labs ● Models ● **POGIL:** ***Process-oriented guided-inquiry learning*** ● **CER:** Claim Evidence & Reasoning Data Analysis
E.O. 10 **Stoichiometry**	**HS-PS1-7** They use chemical equations to represent these interactions and begin to make simple stoichiometric calculations	**Students can** their understanding of the mole in order to convert between different substances in a reaction	**Common Content Key Terms or Vocabulary for each standard** ● Mole ● Avogadro's number ● Molar mass ● Percent composition ● Empirical formula ● Molecular formula	**Informal & Formal Assessments** ● Student Portfolios & or Interactive Notebooks ● Summary Paragraphs, ● GIZMOS Inquiry Labs	**Quarter 3**	**Extension Activities** ● Projects that are standard specific ● Enrichment activities ● Additional Critical Reading / literature readings related to the standard ● Virtual Labs

		Through CER summary paragraphs, lab analysis, and analysis & process activities.	• Stoichiometry • Mole ratio • Limiting reactant • Excess reactant • Theoretical yield • Actual yield • Percent yield **Academic Vocabulary** • Describe • Compare • Contrast • Differentiate • Explain • Hierarchy **Focused Note taking** **Paragraph Summaries** • CER Organizer • CER Summary **Differentiated Critical Reading Strategies**	• Lab Reports • Common Formative Assessments • Common Summative Assessments		• Models • **POGIL:** ***Process-oriented guided-inquiry learning*** • **CER:** Claim Evidence & Reasoning Data Analysis

Essential Guiding Questions

- **What holds atoms together in molecules?**
- **How do chemical reactions absorb and release energy?**

Segment 5: Chemistry of Climate Change

	STANDARD DESCRIPTION	EXAMPLE RIGOR	PREREQUISITE / CONCURRENT / EXISTING SKILLS	COMMON ASSESSMENT	WHEN TAUGHT ?	EXTENSION STANDARDS
	What is the essential standard to be learned?	**What does proficient student work look like?**	**What prior / concurrent / existing knowledge, skills, and/or vocabulary is/are needed for a**	**What assessment(s) will be used to**	**When will this standard**	**What will we do when students have learned the essential standard(s)?**

	Describe in student-friendly vocabulary.	Provide an example and/or description.	student to master this standard?	measure student mastery?	be taught?	
E.O. 11 ***The Carbon Cycle***	**HS-ESS2-2** **HS-ESS2-4** **HS-ESS2-6** **HS-ESS3-2** **HS-ESS3-5** **HS-ESS3-6** Students develop models of energy flow in Earth's climate They revisit combustion reactions from IS1 to focus on emissions from fossil fuel energy sources They apply models of the structures of molecules to explain how different molecules trap heat in the atmosphere Students evaluate different chemical engineering solutions that can reduce the impacts of climate change	**Students can** identify and explain the components of the carbon cycle and model how introducing factors such as fossil fuels and greenhouse gases can disrupt this cycle and cause changes in climate and ecosystems **Through CER summary paragraphs, lab analysis, & process activities.**	**Common Content Key Terms or Vocabulary for each standard** ● Carbon Dioxide ● Carbon Cycle ● Fossil Fuels ● Atmosphere ● Biomass ● Biosphere ● Carbon Reservoir ● Carbon Sink ● Geosphere ● Hydrosphere ● Lithosphere ● Photosynthesis ● Global Warming ● Greenhouse Gases ● Greenhouse Effect ● Heat Flow **Academic Vocabulary** ● Describe ● Compare ● Contrast ● Differentiate ● Explain ● Hierarchy **Focused Note taking Paragraph Summaries** ● CER Organizer ● CER Summary	**Informal & Formal Assessments** ● Student Portfolios & or Interactive Notebooks ● CER/ Summary Paragraphs ● Differentiated Critical Reading ● GIZMOS Inquiry Labs ● Common Formative Assessment ● Common Summative Assessment	**Quarter 4**	**Extension Activities** ● Projects that are standard specific ● Enrichment activities ● Additional Critical Reading / literature readings related to the standard ● Virtual Labs ● Models ● **POGIL:** ***Process-oriented guided-inquiry learning*** ● **CER:** Claim Evidence & Reasoning Data Analysis

Essential Guiding Questions

- **What regulates weather and climate?**
- **What effects are humans having on the climate?**

Segment 6: The Dynamics of Chemical Reactions and Ocean Acidification

	STANDARD DESCRIPTION	EXAMPLE RIGOR	PREREQUISITE / CONCURRENT / EXISTING SKILLS	COMMON ASSESSMENT	WHEN TAUGHT ?	EXTENSION STANDARDS
	What is the essential standard to be learned? Describe in student-friendly vocabulary.	**What does proficient student work look like? Provide an example and/or description.**	**What prior / concurrent / existing knowledge, skills, and/or vocabulary is/are needed for a student to master this standard?**	**What assessment(s) will be used to measure student mastery?**	**When will this standard be taught?**	**What will we do when students have learned the essential standard(s)?**
E.O. 12 ***Reaction Rates & Equilibrium***	**HS-PS1-5** **HS-PS1-6** **HS-PS1-7** Students investigate the factors that affect reaction rates of chemical systems. Students develop models of equilibrium in chemical reactions and design systems that can shift the equilibrium.	**Students can** gather evidence to construct a scientific explanation about what causes speed variations and can investigate the response of reaction rates to varying temperatures and concentrations of reactants **Students can** gather evidence to construct a scientific explanation about what causes an equilibrium to shift from reactants to products in a chemical system	**Common Content Key Terms or Vocabulary for each standard** • Rate • Collision- Theory • Concentration • Volume • Temperature • Surface Area • Dilute • Catalyst • Chemical Equilibrium • Reversible Reaction **Academic Vocabulary** • Describe • Compare • Contrast • Differentiate • Explain • Hierarchy	**Informal & Formal Assessments** • Student Portfolios & or Interactive Notebooks • CER/ Summary Paragraphs • Differentiated Critical Reading • GIZMOS Inquiry Labs • Common Formative Assessment • Common Summative Assessment	**Quarter 4**	**Extension Activities** • Projects that are standard specific • Enrichment activities • Additional Critical Reading / literature readings related to the standard • Virtual Labs • Models • **POGIL:** ***Process-oriented guided-inquiry learning*** • **CER:** Claim Evidence & Reasoning Data Analysis

		Through CER summary paragraphs, lab analysis, & process activities.	**Focused Note taking Paragraph Summaries** • CER Organizer • CER Summary			
E.O. 13 ***Ocean Acidification***	**HS-ESS2-2** **HS-ESS2-6** Students investigate the effects of fossil fuel combustion on ocean chemistry. Students conduct research on the interaction between ocean water and shell-building organisms	**Students can** investigate how fossil fuels and changes in the carbon cycle lead to an increase in acidity of the ocean and determine how these effects can affect various ecosystems **Through CER summary paragraphs, lab analysis, & process activities.**	**Common Content Key Terms or Vocabulary for each standard** • Acid • Base • Neutral • pH • Indicators • Coral Reefs • Carbonates • Ocean Acidification **Academic Vocabulary** • Describe • Compare • Contrast • Differentiate • Explain • Hierarchy **Focused Note taking Paragraph Summaries** • CER Organizer • CER Summary	**Informal & Formal Assessments** • Student Portfolios & or Interactive Notebooks • CER/ Summary Paragraphs • Differentiated Critical Reading • GIZMOS Inquiry Labs • Common Formative Assessment • Common Summative Assessment •	**Quarter 4**	**Extension Activities** • Projects that are standard specific • Enrichment activities • Additional Critical Reading / literature readings related to the standard • • Virtual Labs • Models • **POGIL:** ***Process-oriented guided-inquiry learning*** • **CER:** Claim Evidence & Reasoning Data Analysis

Essential Guiding Questions

- **How can you alter chemical equilibrium and reaction rates?**
- **How can you predict the relative quantities of products in a chemical reaction?**

ELA Connection

RST .11-12.1 WHST .9-12.2 (HS-LS1-1)	**Cite specific textual evidence** to support analysis of science and technical texts and annotating distinctions that the author makes and to any gaps or inconsistencies in data.	**Students can** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. **Through CER/Summary Paragraphs and Philosophical Chairs**	**Academic Language** ● Describe ● Explain ● Differentiate ● Compare/Contrast ● Marking text ● Charting text ● Interacting with text ● Annotating text **Focused Note taking Paragraph Summaries** ● CER Organizer ● CER Summary **Differentiated Critical Reading Strategies**	**Informal & Formal Assessments** ● Student Portfolios & or Interactive Notebooks ● CER/ Summary Paragraphs ● Differentiated Critical Reading ● Inquiry Labs ● Lab Reports ● Common Formative Assessments	**Quarters 1-4**	**Extension Activities** ● Projects that are standard specific ● Enrichment activities ● Philosophical Chairs ● Additional literature readings related to the standard ● Online / Digital Critical Readings--Marking and Charting Text and Rhetorical Precis.