Stockton Unified School District

EDISON HIGH SCHOOL

Home of the Vikings

SUSD

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

NEW CURRICULUM FOR 20-21!!!! THIS DOCUMENT IS A WORK IN PROGRESS!

GRADE:	10-12	**SUBJECT:**	***Physics***	**SEMESTER:**	1 & 2	**TEAM MEMBERS:**	*Dr. Clark and Dr. Wharry and (Ms. Carranza)*

Instructional Segment 0:
Science Skills

Instructional Segment 0 Science Skills--SEP 1-6	**E.O. 0** ***The Scientific Method*** **SEP 1, SEP 2, SEP 3, SEP 4, SEP 5, SEP 6, SEP 7, SEP 8** Students will carry out the steps of the Scientific Method through Investigation & Experimentation including: designing experiments, creating	**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 limitations on the precision of the data (e.g., number of trials, time), and	**Common Content Key Terms or Vocabulary for each standard:** • Variable: Independent & Dependent • Hypothesis • Data • Observation **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(Claim, Evidence, Reasoning)/ Summary Paragraphs • Differentiated Critical Reading • Inquiry Labs • Lab Reports • Common Formative Assessments • Common	**Quarter 1 & Ongoing during the Course**	**Extension Activities / HONOR'S** • 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 &

	hypotheses, collecting & analyzing data, then developing conclusions based on the data**.**	refine the design accordingly. Engage in trial and error. **Through CER summary paragraphs, experimental design, lab analysis, evaluations, & process activities.**	**Differentiated Critical Reading Strategies** **Steps of the Scientific Method** **Microscope Technique** **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	District Summative Assessments		Reasoning Data Analysis ● **POGIL:** ***Process oriented guided inquiry learning***

Segment 1: Forces and Motion

1 Forces and Motion	Students make predictions using Newton's Laws. Students mathematically describe how changes in motion relate to forces. They investigate collisions in Earth's crust and in an engineering challenge.

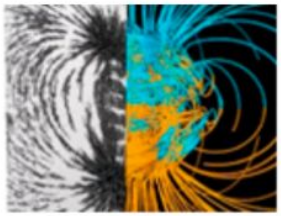
	STANDARD DESCRIPTION	EXAMPLE RIGOR	PREREQUISITE / CONCURRENT / EXISTING SKILLS	COMMON ASSESSMENT	WHEN TAUGHT ?	EXTENSION STANDARDS
	What is the essential standard to be learned? Describe in student-friendly vocabulary.	**What does proficient student work look like? Provide an example and/or description.**	**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 **Newton's 2nd Law**	PS2-1 Analyze data to support the claim that Newton's second law of motion describes the	**EXAMPLE:** Calculate F_{net} given m and a → calculate a where F remains constant	**Content Vocabulary/Concepts:** • Force • Free-body diagram • Newton's first law of motion	**Informal & Formal Assessments** • Student Portfolios & or Interactive Notebooks • Summary	**Semester 1**	**Extension Activities** • Projects that are standard specific • Enrichment activities • Additional literature readings

	mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.	like gravity: moving down ramp, falling	• Inertia • Equilibrium • Net force • Newton's second law of motion • Weight • Newton's third law • Static and kinetic friction	Paragraphs, • Inquiry Labs • Lab Reports • Formative Assessments • Summative Assessments **SUSD Common:** • Common District Lab Activity: F=ma (Vernier equipment) • Friction Lab (Vernier equipment)		related to the standard • Virtual Labs

E.O. 2
Students mathematically describe how changes in motion relate to forces.
	Momentum
	
	PS2-2. Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.
	
	PS2-3. Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes
		EXAMPLE:
		Research, drawing info from different sources → Essay on the science behind:
		
		Helmets, seatbelts, airbags
			Content Vocabulary/Concepts:
			• Momentum
			• Impulse
			• Impulse-momentum theorem
			• Conservation of momentum
			  ○ Closed and Isolated systems
			• Law of conservation of momentum
			  ○ Recoil
			• Elastic and inelastic collision
			• Impulse-momentum theorem
				Informal & Formal Assessments
				• Student Portfolios & or Interactive Notebooks
				• Summary Paragraphs,
				• Inquiry Labs
				• Lab Reports
				• Formative Assessments
				• Summative Assessments
				
				SUSD Curriculum Office:
				• Collision activities (using metal balls)
				
				• Explosion (dynamic carts)
					Semester 1	**Extension Activities**
						• Projects that are standard specific
						• Enrichment activities
						• Additional literature readings related to the standard
						• Virtual Labs

	the force on a macroscopic object during a collision.			(Vernier equipment) ● Eggdrop – parachute, cushioning		

Segment 2: Forces at a Distance



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Forces at a Distance

Students investigate gravitational and electromagnetic forces and describe them mathematically. They predict the motion of orbiting objects in the solar system. They link the macroscopic properties of materials to microscopic electromagnetic attractions.

	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	[PS 2-4] Use mathematical representation of Newton's Law of Gravitation to describe and predict the gravitational	**Student can** **a**. Apply the proportional relationship of the law of universal gravitation, $F = Gm_1m_2/d^2$. **b**. Explain why a	**Vocabulary/Concepts:** ● Uniform circular motion ● Gravitational force ● Law of Universal Gravitation ● Planetary Motion	**Informal & Formal Assessments** ● Student Portfolios & or Interactive Notebooks ● CER(Claim, Evidence,	**Semester 1**	**Extension Activities** ● Projects that are standard specific ● Enrichment activities ● Additional Critical Reading / literature

Gravitation	forces between objects.	spaceship in a stable circular orbit is in free fall and why a person in that spaceship experiences weightlessness. **c.** Use Newton's second law and the law of universal gravitation to show why all objects near the surface of the earth fall with the same constant acceleration. **Through CER summary paragraphs, lab analysis, & process activities.**		Reasoning)/ Summary Paragraphs • Differentiated Critical Reading • Inquiry Labs • Lab Reports • Common Formative Assessments • Common District Summative Assessments		readings related to the standard • Virtual Labs • Models • **POGIL:** *Process oriented guided-inquiry learning* • **CER:** Claim Evidence & Reasoning Data Analysis
E.O. 4 **Electrostatic Forces**	[PS 2-4] Use mathematical representation of Coulomb's Law to describe and predict the electrostatic forces between objects.	The student will demonstrate the ability to identify kinds of electric charges, analyze interactions between two charged objects, and describe electric fields.	**Content Vocabulary/Concepts:** • charge • conduction • induction • Electrostatics • Electric field • Coulomb's Law **Academic Vocabulary** • Describe • Define • Calculate	**Informal & Formal Assessments** • Student Portfolios &/or Interactive Notebooks • CER/Summary Paragraphs • Differentiated Critical Reading • Inquiry Labs	**Semester 1**	**Extension Activities** • Projects that are standard specific • Enrichment activities • Additional Critical Reading / literature readings related to the standard • Virtual Labs • Models • **POGIL:** ***Process-orient***

		Through CER summary paragraphs, lab analysis, & process activities.	• Analyze • Differentiate • Apply **Focused note taking** **Paragraph Summaries** • CER Organizer • CER Summary **Differentiated Critical Reading Strategies** **Problem Solving Graphic Organizers**	• Lab Reports • Common Formative Assessments • Common Summative Assessments ,		***ed guided-inquiry learning*** • **CER:** Claim Evidence & Reasoning Data Analysis

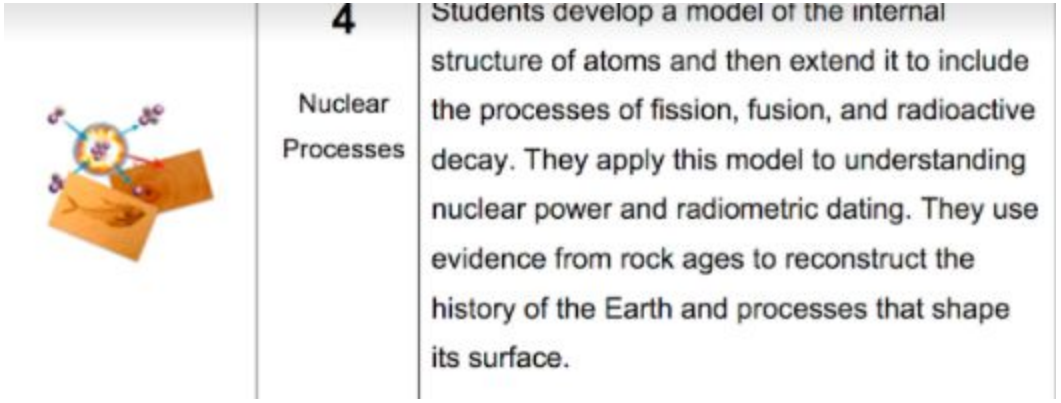
Segment 3: Energy Conservation

	**3** Energy Conversion	Students track energy transfer and conversion through different stages of power plants. They evaluate different power plant technologies. They investigate electromagnetism to create models of how generators work and obtain and communicate information about how solar photovoltaic systems operate. They design and test their own energy conversion devices.

E.O. 5	[	. **Through CER summary paragraphs, lab analysis, & process activities.**	**Content Vocabulary/Concepts:** ● **Academic Vocabulary** ● Describe ● Define ● Calculate ● Analyze ● Differentiate ● Apply **Focused note taking** **Paragraph Summaries** ● CER Organizer ● CER Summary **Differentiated Critical Reading Strategies** **Problem Solving Graphic Organizers**	**Informal & Formal Assessments** ● Student Portfolios &/or Interactive Notebooks ● CER/Summary Paragraphs ● Differentiated Critical Reading ● Inquiry Labs ● Lab Reports ● Common Formative Assessments ● Common Summative Assessments ,	**Semester 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
E.O. 6		**Through CER summary paragraphs, lab analysis, & process activities.**	**Common Key Content Terms or Vocabulary for each standard** ● **Academic Language** ● Describe ● Explain ● Differentiate ● Compare/Contrast	**Informal & Formal Assessments** ● Student Portfolios & or Interactive Notebooks ● CER/Summary Paragraphs ● Differentiated	**Semester 1**	**Extension Activities** ● Projects that are standard specific ● Enrichment activities ● Additional Critical Reading / literature readings related to the standard

			• Construct • Model • Replicate **Focused Note taking** **Paragraph Summaries** • CER Organizer • CER Summary **Differentiated Critical Reading Strategies**	Critical Reading • Inquiry Labs • Lab Reports • Common Formative Assessments • Common Summative Assessments		• Virtual Labs • Models • **POGIL:** ***Process-oriented guided-inquiry learning*** • **CER:** Claim Evidence & Reasoning Lab Data Analysis

Segment 4: Nuclear Processes and Earth History



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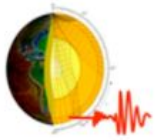
	What is the essential standard to be learned? Describe in student-friendly vocabulary.	**What does proficient student work look like? Provide an example and/or description.**	**What prior / concurrent / existing knowledge, skills, and/or vocabulary is/are needed for a student to master this standard?**	**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 7	.	**Through CER summary paragraphs, lab analysis dichotomous key classification, cladograms & process activities.**	**Common Content Key Terms or Vocabulary for each standard** ● **Academic Language** ● Describe ● Explain ● Differentiate ● Compare/Contrast ● Develop ● Illustrate **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, ● MAP Assessment Results	**Semester 2**	**Extension Activities** ● Projects that are standard specific ● Enrichment activities ● Additional Critical Reading / literature readings related to the standard ● Virtual Labs ● AP Extension activities ● **POGIL:** ***Process-oriented guided-inquiry learning*** ● **CER:** Claim Evidence & Reasoning Data Analysis
E.O.	.	**Through CER summary paragraphs, lab analysis, & process activities.**	**Common Content Key Terms or Vocabulary for each standard,** ● **Academic Language** ● Describe ● Explain ● Differentiate ● Compare/Contrast ● Model ● Illustrate **Focused Note taking Paragraph Summaries** ● CER Organizer ● CER Summary **Differentiated Critical**	**Informal & Formal Assessments** ● Student Portfolios & or Interactive Notebooks ● CER/Summary Paragraphs ● Differentiated Critical Reading ● Inquiry Labs ● Lab Reports ● Common Formative	**Semsterr 2**	**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***

			Reading Strategies	Assessments • Common Summative Assessments , • MAP Assessment Results		• **CER:** Claim Evidence & Reasoning Data Analysis

Segment 5: Waves and Electromagnetic Radiation



5 Waves and Electro-magnetic Radiation	Students make mathematical models of waves and apply them to seismic waves traveling through the Earth. They obtain and communicate information about other interactions between waves and matter with a particular focus on electromagnetic waves. They obtain, evaluate, and communicate information about health hazards associated with electromagnetic waves. They use models of wave behavior to explain information transfer using waves and the wave-particle duality.

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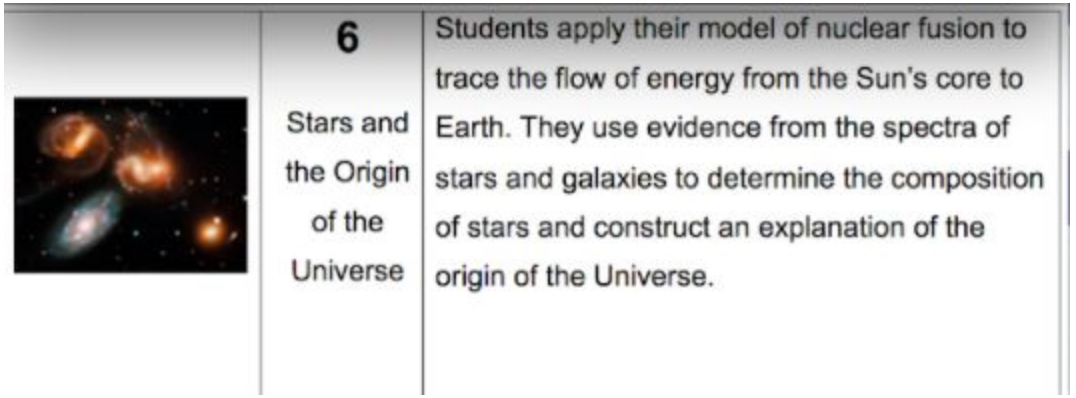
E.O.		**Through CER summary paragraphs, lab**	**Common Content Key Terms or Vocabulary for each standard** **Academic Language** • Describe	**Informal & Formal Assessments** • Student Portfolios & or Interactive Notebooks	**Semester 2**	**Extension Activities** • Projects that are standard specific • Enrichment activities • Additional

		analysis, Punnet square construction and analysis & process activities.	• Explain • Differentiate • Compare/Contrast • Determine • Develop **Focused Note taking** **Paragraph Summaries** • CER Organizer • CER Summary **Differentiated Critical Reading Strategies**	• Summary Paragraphs, • Inquiry Labs • Lab Reports • Common Formative Assessments • Common Summative Assessments , • MAP Assessment Results		Critical Reading / literature readings related to the standard • Virtual Labs • MAP Distance Activity • CHI Square Analysis • **POGIL:** ***Process-oriented guided-inquiry learning*** • **CER:** Claim Evidence & Reasoning Data Analysis

Segment 6: Stars and Origins of the Universe



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	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.		• **Through CER summary paragraphs, lab analysis, & process activities.**	**Common Content Key Terms or Vocabulary for each standard:** • **Academic Vocabulary** • Describe • Compare • Contrast • Differentiate • Explain • Hierarchy **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 • Common Formative Assessment • Common Summative Assessment • MAP Assessment Results	**Semester 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.		**Through CER summary paragraphs, lab analysis, & process activities.**	**Common Content Key Terms or Vocabulary for each standard** **Academic Language** • Describe • Explain • Differentiate • Compare/Contrast • Investigate **Focused Note taking**	**Informal & Formal Assessments** • Student Portfolios & or Interactive Notebooks • CER/Summary Paragraphs • Differentiated Critical	**Semster 2**	**Extension Activities** • Projects that are standard specific • Enrichment activities • Additional Critical Reading / literature readings related to the standard • Virtual Labs

			Paragraph Summaries • CER Organizer • CER Summary **Differentiated Critical Reading Strategies** **Microscope Technique**	Reading • Inquiry Labs • Lab Reports • Common Formative Assessments • Common Summative Assessments, • MAP Assessment Results		• Models • **POGIL:** ***Process-oriented guided-inquiry learning*** • **CER:** Claim Evidence & Reasoning Data Analysis
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.

Image Sources: National Highway Traffic Safety Administration2016; Black and Davis 1913, 242, fig. 200; NASA 2003a; Leaflet 2004; Wikimedia Commons 2011; Sorenson 2012; Jordan 2010; National Oceanic and Atmospheric Administration, National Centers for Environmental Information 2008b; Ezekowitz 2008; NASA, ESA, and the Hubble SM4 ERO Team 2009.