



Stockton Unified School District

**EDISON HIGH SCHOOL**

Home of the Vikings



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

<b>GRADE:</b>	9-10	<b>SUBJECT:</b>	<i>Biology HONORS</i>	<b>SEMESTER:</b>	1 & 2	<b>TEAM MEMBERS:</b>	Lor, Yamuni
---------------	------	-----------------	---------------------------	------------------	-------	----------------------	-------------

**Scientific Process Skills: Investigation & Investigation**

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)?

**Instructional Segment 0:  
Science Skills**

<b>Instructional Segment 0 Science Skills--SEP 1-6</b>	<b>E.O. 1 The Scientific Method</b>  SEP 1, SEP 2, SEP 3, SEP 4, SEP 5, SEP 6, SEP 7, SEP 8	Students can <b>plan</b> & <b>conduct</b> an <b>investigation</b> individually & collaboratively to <b>produce</b> data to serve as the basis for evidence, in the design: <b>decide</b> on	<b>Common Content Key Terms or Vocabulary for each standard:</b> <ul style="list-style-type: none"> <li>Variable: Independent &amp; Dependent</li> <li>Hypothesis</li> <li>Data</li> <li>Observation</li> </ul>	<b>Informal &amp; Formal Assessments</b> <ul style="list-style-type: none"> <li>Student Portfolios &amp; or Interactive Notebooks</li> <li>CER(Claim, Evidence, Reasoning)/</li> </ul>	<b>Quarter 1 &amp; Ongoing during the Course</b>	<b>Extension Activities / HONOR'S</b> <ul style="list-style-type: none"> <li>Projects that are standard specific</li> <li>Enrichment activities</li> <li>Additional Critical Reading / literature</li> </ul>
--	---	---	---	--	--	--

	<p>Students will carry out the steps of the Scientific Method through Investigation &amp; Experimentation including: designing experiments, creating hypotheses, collecting &amp; analyzing data, then developing conclusions based on the data.</p>	<p>types, how much, and accuracy of data needed to <b>produce</b> reliable measurements and <b>consider</b> limitations on the precision of the data (e.g., number of trials, time), and <b>refine</b> the <b>design</b> accordingly. Engage in trial and error.</p> <p><b>Through CER summary paragraphs, experimental design, lab analysis, evaluations, &amp; process activities.</b></p>	<p><b>Academic Vocabulary</b></p> <ul style="list-style-type: none"> <li>• Describe</li> <li>• Compare</li> <li>• Contrast</li> <li>• Differentiate</li> <li>• Explain</li> </ul> <p><b>Focused note taking Paragraph Summaries</b></p> <ul style="list-style-type: none"> <li>• CER Organizer</li> <li>• CER Summary</li> </ul> <p><b>Differentiated Critical Reading Strategies Steps of the Scientific Method</b></p> <p><b>Microscope Technique</b></p> <p><b>Metric Measurement using rulers, balances and glassware.</b></p> <p><b>Conduct /Complete:</b></p> <ul style="list-style-type: none"> <li>• measurement</li> <li>• Data Collection</li> <li>• Data Analysis including finding averages</li> <li>• sources of error</li> <li>• Graph data using various forms of graphs</li> </ul>	<p>Summary Paragraphs</p> <ul style="list-style-type: none"> <li>• Differentiated Critical Reading</li> <li>• Inquiry Labs</li> <li>• Lab Reports</li> <li>• Common Formative Assessments</li> <li>• Common District Summative Assessments</li> </ul>		<p>readings related to the standard</p> <ul style="list-style-type: none"> <li>• Virtual Labs</li> <li>• Graph Analysis using <b>AVID LENSES</b></li> <li>• Design a Science Experiment</li> <li>• <b>CER:</b> Claim Evidence &amp; Reasoning Data Analysis</li> <li>• <b>POGIL:</b> <i>Process oriented guided inquiry learning</i></li> </ul>
--	--	--	--	---	--	---

## Segment 1: Ecosystem Interaction and Energy

	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)?
<b>E.O. 2 Ecology &amp; Biodiversity</b>	<p>HS LS 2-1 Through HS LS 2-8 &amp; HS LS-4-6 LS 2.A through LS 2-D &amp; LS 4.D</p> <p>Explain interactions and the movement of energy between organisms and the environment.</p>	<p>Students can <b>demonstrate</b> an ability to <b>investigate</b> the role of <b>biodiversity in ecosystems</b> and the role of <b>animal behavior</b> on survival of individuals and species. Students can <b>model</b> of interactions among organisms and how</p>	<p>Common Key Terms or Vocabulary for each standard</p> <ul style="list-style-type: none"> <li>● Resources</li> <li>● Climate</li> <li>● Cycles of matter</li> <li>● Energy</li> <li>● Nitrogen</li> <li>● Atmosphere</li> <li>● Hydrosphere</li> <li>● Geosphere</li> <li>● Physical change</li> </ul>	<p>Informal &amp; Formal Assessments</p> <ul style="list-style-type: none"> <li>● Student Portfolios &amp; or Interactive Notebooks</li> <li>● CER/Summary Paragraphs</li> <li>● Differentiated Critical Reading</li> <li>● Inquiry Labs</li> <li>● Lab Reports</li> </ul>	<p>Quarter 1</p>	<p>Extension Activities / HONOR'S</p> <ul style="list-style-type: none"> <li>● Projects that are standard specific</li> <li>● Enrichment activities</li> <li>● Additional Critical Reading / literature readings related to the standard</li> <li>● Virtual Labs</li> <li>● Models</li> </ul>

		<p>those interactions influence the <b>dynamics of ecosystems</b>.</p> <p>Students can <b>evaluate</b> and <b>adapt</b> existing <b>renewable and nonrenewable resources as they relate to ecological sustainability</b> through a research project and presentation.</p> <p><b>Through CER summary paragraphs, lab analysis, &amp; process activities.</b></p>	<p><b>Academic Language</b></p> <ul style="list-style-type: none"> <li>• Describe</li> <li>• Explain</li> <li>• Differentiate</li> <li>• Compare/Contrast</li> <li>• Demonstrate</li> <li>• Investigate</li> </ul> <p><b>Focused Note taking Paragraph Summaries</b></p> <ul style="list-style-type: none"> <li>• CER Organizer</li> <li>• CER Summary</li> </ul> <p><b>Differentiated Critical Reading Strategies</b></p>	<ul style="list-style-type: none"> <li>• Common Formative Assessments</li> <li>• Common Summative Assessment</li> </ul>		<ul style="list-style-type: none"> <li>• <b>POGIL:</b> <i>Process Oriented Guided Inquiry Learning</i></li> <li>• <b>CER:</b> Claim Evidence &amp; Reasoning Data Analysis</li> </ul>
--	--	---	--	---	--	---

### Essential Guiding Questions

- What factors affect the size of populations within an ecosystem?
- What are common threats to remaining natural ecosystems and biodiversity?
- How can these threats be reduced?

## Instructional Segment 2

### History of Earth's Atmosphere: Photosynthesis and Respiration

	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)?
<b>E.O. 3</b>	<p>PS 1.A, ESS 2.C, SEP 6 , HS-LS1-2</p> <p>Students can identify &amp; describe the components of atoms, ions &amp; molecules, describe the</p>	<p>Students can analyze and interpret <b>Models</b> (e.g., physical, computer models) that <b>simulate</b> systems and interactions— including energy ,</p>	<p>Common content Key Terms or Vocabulary for each standard</p> <ul style="list-style-type: none"> <li>● Molecules</li> <li>● Elements</li> <li>● Compounds</li> <li>● Amino acids</li> <li>● Carbon</li> <li>● Hydrogen</li> </ul>	<p>Informal &amp; Formal Assessments</p> <ul style="list-style-type: none"> <li>● Student Portfolios &amp; or Interactive Notebooks</li> <li>● CER/Summary Paragraphs</li> <li>● Differentiated</li> </ul>	<p>Quarter 1</p>	<p>Extension Activities / HONOR'S</p> <ul style="list-style-type: none"> <li>● Projects that are standard specific</li> <li>● Enrichment activities</li> <li>● Additional Critical Reading / literature</li> </ul>

<p><b>Introduction to Chemistry</b></p>	<p>properties of water, determine the reactants and products, as well as recognize a chemical reaction in equilibrium, in the context of biological processes.</p>	<p>matter, and information flows—within and between <b>systems</b>.</p> <p><b>Through Molecular Models, CER summary paragraphs, lab analysis, &amp; process activities.</b></p>	<ul style="list-style-type: none"> <li>● Oxygen</li> </ul> <p><b>Academic Language:</b></p> <ul style="list-style-type: none"> <li>● Describe</li> <li>● Explain</li> <li>● Differentiate</li> <li>● Compare/Contrast</li> </ul> <p><b>Focused Note taking Paragraph Summaries</b></p> <ul style="list-style-type: none"> <li>● CER Organizer</li> <li>● CER Summary</li> </ul> <p><b>Differentiated Critical Reading Strategies</b></p> <p>Parts of an Atom Properties of Periodic Table</p>	<p>Critical Reading</p> <ul style="list-style-type: none"> <li>● Inquiry Labs</li> <li>● Lab Reports</li> <li>● Common Formative Assessments</li> <li>● Common Summative Assessments</li> </ul>		<p>readings related to the standard</p> <ul style="list-style-type: none"> <li>● Virtual Labs</li> <li>● Models</li> <li>● <b>POGIL:</b> <i>Process oriented guided-inquiry learning</i></li> <li>● <b>CER:</b> Claim Evidence &amp; Reasoning Data Analysis</li> </ul>
---	--	---	---	---	--	---

**Essential Guiding Questions**

- How do living things acquire energy and matter for life?
- How do organisms store energy?
- How are photosynthesis and cellular respiration connected?
- How do organisms use the raw materials they ingest from the environment?
- How has the cycling of energy and matter changed over Earth's history?

## **Instructional Segment 2**

### **History of Earth's Atmosphere: Photosynthesis and Respiration**

<p><b>E.O. 4</b> <b>Biochemistry:</b> <b>Carbon- based molecules</b></p>	<p><b>HS LS 1-6</b></p> <p>Identify and describe the composition of the 4 carbon based biological molecules and how they interact in the systems of living things.</p>	<p><b>Students can</b> <b>Construct</b> and <b>revise</b> an <b>explanation based on evidence</b> for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.</p> <p><b>Through CER summary paragraphs, lab analysis, &amp; process activities.</b></p>	<p><b>Common content Key Terms or Vocabulary for each standard</b></p> <ul style="list-style-type: none"> <li>• Molecules</li> <li>• Elements,</li> <li>• Amino acids</li> <li>• Carbon</li> <li>• Hydrogen</li> <li>• Oxygen</li> <li>• Nitrogen</li> <li>• Phosphorus</li> <li>• catalyst</li> </ul> <p><b>Academic Language</b></p> <ul style="list-style-type: none"> <li>• Model</li> <li>• Construct</li> <li>• Revise</li> <li>• Describe</li> <li>• Explain</li> <li>• Differentiate</li> <li>• Compare/Contrast</li> </ul> <p><b>Focused Note taking Paragraph Summaries</b></p> <ul style="list-style-type: none"> <li>• CER Organizer</li> <li>• CER Summary</li> </ul> <p><b>Differentiated Critical Reading Strategies</b></p>	<p><b>Informal &amp; Formal Assessments</b></p> <ul style="list-style-type: none"> <li>• Student Portfolios &amp;/or Interactive Notebooks</li> <li>• CER/Summary Paragraphs</li> <li>• Differentiated Critical Reading</li> <li>• Inquiry Labs</li> <li>• Lab Reports</li> <li>• Common Formative Assessments</li> <li>• Common Summative Assessments,</li> </ul>	<p><b>Quarter 2</b></p>	<p><b>Extension Activities / HONOR'S</b></p> <ul style="list-style-type: none"> <li>• Projects that are standard specific</li> <li>• Enrichment activities</li> <li>• Additional Critical Reading / literature readings related to the standard</li> <li>• Enzyme Catalyst Activity</li> <li>• Virtual Labs</li> <li>• Models</li> <li>• <b>POGIL:</b> <i>Process Oriented Guided Inquiry Learning</i></li> <li>• <b>CER:</b> Claim Evidence &amp; Reasoning Data Analysis</li> </ul>
--	--	--	---	--	-------------------------	---

**Essential Guiding Questions**

- How do living things acquire energy and matter for life?
- How do organisms store energy?
- How are photosynthesis and cellular respiration connected?
- How do organisms use the raw materials they ingest from the environment?
- How has the cycling of energy and matter changed over Earth's history?



<p><b>E.O. 5</b> <b>Cell Energy: Photosynthesis and Respiration</b></p>	<p>HS LS 1-2, HS LS1-7, HS LS 2-3</p> <p>Model the chemical reaction of the photosynthesis process.</p> <p>Describe the process of transforming sugars into cellular energy.</p>	<p>Students can <b>describe</b> the main way that energy is cycled from solar energy, into producers, and through consumers, <b>using the components of the carbon cycle</b>, in which carbon is exchanged among the biosphere, atmosphere, oceans, and geosphere to maintain life on Earth, <b>especially through cellular respiration and photosynthesis.</b></p> <p><b>Through CER summary paragraphs, lab analysis, &amp; process activities.</b></p>	<p><b>Common Key Content Terms or Vocabulary for each standard</b></p> <ul style="list-style-type: none"> <li>• Light energy</li> <li>• Chemical energy</li> <li>• Chemical process</li> <li>• Bonds</li> <li>• Compounds</li> <li>• Product / Output</li> <li>• Reactant / Input</li> </ul> <p><b>Academic Language</b></p> <ul style="list-style-type: none"> <li>• Describe</li> <li>• Explain</li> <li>• Differentiate</li> <li>• Compare/Contrast</li> <li>• Construct</li> <li>• Model</li> <li>• Replicate</li> </ul> <p><b>Focused Note taking Paragraph Summaries</b></p> <ul style="list-style-type: none"> <li>• CER Organizer</li> <li>• CER Summary</li> </ul> <p><b>Differentiated Critical Reading Strategies</b></p>	<p><b>Informal &amp; Formal Assessments</b></p> <ul style="list-style-type: none"> <li>• Student Portfolios &amp; or Interactive Notebooks</li> <li>• CER/Summary Paragraphs</li> <li>• Differentiated Critical Reading</li> <li>• Inquiry Labs</li> <li>• Lab Reports</li> <li>• Common Formative Assessments</li> <li>• Common Summative Assessments</li> </ul>	<p><b>Quarter 2</b></p>	<p><b>Extension Activities / HONOR'S</b></p> <ul style="list-style-type: none"> <li>• Projects that are standard specific</li> <li>• Enrichment activities</li> <li>• Additional Critical Reading / literature readings related to the standard</li> <li>• Virtual Labs</li> <li>• Models</li> <li>• <b>POGIL: Process Oriented Guided Inquiry Learning</b></li> <li>• <b>CER: Claim Evidence &amp; Reasoning Lab Data Analysis</b></li> </ul>
---	--	---	--	---	-------------------------	--

**Essential Guiding Questions**

- How do living things acquire energy and matter for life?
- How do organisms store energy?
- How are photosynthesis and cellular respiration connected?
- How do organisms use the raw materials they ingest from the environment?
- How has the cycling of energy and matter changed over Earth's history?

## Segment 3: Evidence of Evolution

	STANDARD DESCRIPTION	EXAMPLE RIGOR	PREREQUISITE / CONCURRENT / EXISTING SKILLS	COMMON ASSESSMENT	WHEN TAUGHT ?	EXTENSION STANDARDS
	<p>What is the essential standard to be learned? Describe in student-friendly vocabulary.</p>	<p>What does proficient student work look like? Provide an example and/or description.</p>	<p>What prior / concurrent / existing knowledge, skills, and/or vocabulary is/are needed for a student to master this standard?</p>	<p>What assessment(s) will be used to measure student mastery?</p>	<p>When will this standard be taught?</p>	<p>What will we do when students have learned the essential standard(s)?</p>
<p><b>E.O 6</b> <i>History of Earth's Atmosphere &amp; Biosphere</i></p>	<p><b>HS-LS1-2.</b> Explain how the plates/structure of the Earth have changed over time.  Explain how living things are classified phylogenetically.</p>	<p>Students can <b>model</b> and <b>analyze</b> theory of plate tectonics and continental drift as it relates the evolution of the atmosphere and biosphere of planet Earth. Students can <b>classify</b> organisms using a dichotomous key. Students can <b>construct</b> and <b>analyze</b> a cladogram.</p> <p><b>Through CER</b></p>	<p><b>Common Content Key Terms or Vocabulary for each standard</b></p> <ul style="list-style-type: none"> <li>● Continental Drift</li> <li>● Plate tectonics</li> <li>● Phylogeny</li> <li>● Cladogram</li> <li>● Dichotomous Key</li> <li>● Continental &amp; Oceanic PLATES</li> <li>● Mantle</li> <li>● Inner &amp; Outer Core</li> <li>● Convection Current</li> <li>● Divergent &amp; Convergent Boundaries</li> </ul> <p><b>Academic Language</b></p> <ul style="list-style-type: none"> <li>● Describe</li> <li>● Explain</li> </ul>	<p><b>Informal &amp; Formal Assessments</b></p> <ul style="list-style-type: none"> <li>● Student Portfolios &amp; or Interactive Notebooks</li> <li>● CER/Summary Paragraphs</li> <li>● Differentiated Critical Reading</li> <li>● Inquiry Labs</li> <li>● Lab Reports</li> <li>● Common Formative Assessments</li> <li>● Common Summative Assessments,</li> </ul>	<p><b>Quarter 2</b></p>	<p><b>Extension Activities / HONOR'S</b></p> <ul style="list-style-type: none"> <li>● Projects that are standard specific</li> <li>● Enrichment activities</li> <li>● Additional Critical Reading / literature readings related to the standard</li> <li>● Virtual Labs</li> <li>● AP Extension activities</li> <li>● <b>POGIL:</b> <i>Process Oriented Guided Inquiry Learning</i></li> <li>● <b>CER:</b> Claim Evidence &amp;</li> </ul>

		summary paragraphs, lab analysis dichotomous key classification, cladograms & process activities.	<ul style="list-style-type: none"> <li>• Differentiate</li> <li>• Compare/Contrast</li> <li>• Develop</li> <li>• Illustrate</li> </ul> <b>Focused Note taking Paragraph Summaries</b> <ul style="list-style-type: none"> <li>• CER Organizer</li> <li>• CER Summary</li> </ul> <b>Differentiated Critical Reading Strategies</b>			Reasoning Data Analysis
--	--	---	--	--	--	-------------------------

### Essential Guiding Questions

- How do layers of rock form and how do they contain fossils?
- Why do we see similar fossils across the world from each other but living organisms that are very different?
- What evidence shows that different species are related?
- How did modern day humans evolve?

<b>E.O. 7</b> <b>Biological Evolution: Unity &amp; Diversity</b>	HS-LS-4-1 through 4-6 & HS-LS-3-3  Describe how all living things are related and how they have changed over time	Students can <b>Model</b> the relationships that exist between different species and <b>illustrate</b> how the development of different adaptations has led to increased speciation. <b>Through CER summary paragraphs, lab</b>	<b>Common Content Key Terms or Vocabulary for each standard,</b> <ul style="list-style-type: none"> <li>• Evolution</li> <li>• Adaptation</li> <li>• Natural Selection</li> <li>• Artificial Selection</li> <li>• Fitness</li> <li>• Variation</li> <li>• Overproduction</li> <li>• Descent with Modification</li> <li>• Inheritance</li> </ul>	<b>Informal &amp; Formal Assessments</b> <ul style="list-style-type: none"> <li>• Student Portfolios &amp; or Interactive Notebooks</li> <li>• CER/Summary Paragraphs</li> <li>• Differentiated Critical Reading</li> <li>• Inquiry Labs</li> <li>• Lab Reports</li> </ul>	Quarter 2	<b>Extension Activities / HONOR'S</b> <ul style="list-style-type: none"> <li>• Projects that are standard specific</li> <li>• Enrichment activities</li> <li>• Additional Critical Reading / literature readings related to the standard</li> <li>• Virtual Labs</li> <li>• <b>POGIL:</b></li> </ul>
---	---	--	---	--	-----------	--

		analysis, & process activities.	<b>Academic Language</b> <ul style="list-style-type: none"> <li>Describe</li> <li>Explain</li> <li>Differentiate</li> <li>Compare/Contrast</li> <li>Model</li> <li>Illustrate</li> </ul> <b>Focused Note taking</b> <b>Paragraph Summaries</b> <ul style="list-style-type: none"> <li>CER Organizer</li> <li>CER Summary</li> </ul> <b>Differentiated Critical Reading Strategies</b>	<ul style="list-style-type: none"> <li>Common Formative Assessments</li> <li>Common Summative Assessments,</li> </ul>		<i>Process Oriented Guided Inquiry Learning</i> <ul style="list-style-type: none"> <li><b>CER:</b> Claim Evidence &amp; Reasoning Data Analysis</li> </ul>
--	--	---------------------------------	--	---	--	--

### Essential Guiding Questions

- How do layers of rock form and how do they contain fossils?
- Why do we see similar fossils across the world from each other but living organisms that are very different?
- What evidence shows that different species are related?
- How did modern day humans evolve?

## Segment 4: Inheritance of Traits

	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)?

<p><b>E.O. 8</b> <b>Inheritance &amp; Variation of Traits</b></p>	<p>HS-LS-3-1, 3-2 &amp; 3-3 Explain how monohybrid and dihybrid traits are passed from parents to offspring and create and analyze pedigree charts</p>	<p><b>Students can</b> explain the mechanisms of genetic inheritance and describe the environmental and genetic causes of gene mutation and the alteration of gene expression.</p> <p><b>Through CER</b> summary paragraphs, lab analysis, Punnet square construction and analysis &amp; process activities.</p>	<p><b>Common Content Key Terms or Vocabulary for each standard</b></p> <ul style="list-style-type: none"> <li>• Characteristic</li> <li>• Homozygous</li> <li>• Heterozygous</li> <li>• Dominant</li> <li>• Recessive</li> <li>• Phenotype</li> <li>• Genotype</li> <li>• Traits</li> <li>• Replication</li> <li>• Environmental factors</li> <li>• Viable errors</li> </ul> <p><b>Academic Language</b></p> <ul style="list-style-type: none"> <li>• Describe</li> <li>• Explain</li> <li>• Differentiate</li> <li>• Compare/Contrast</li> <li>• Determine</li> <li>• Develop</li> </ul> <p><b>Focused Note taking Paragraph Summaries</b></p> <ul style="list-style-type: none"> <li>• CER Organizer</li> <li>• CER Summary</li> </ul> <p><b>Differentiated Critical Reading Strategies</b></p>	<p><b>Informal &amp; Formal Assessments</b></p> <ul style="list-style-type: none"> <li>• Student Portfolios &amp; or Interactive Notebooks</li> <li>• Summary Paragraphs,</li> <li>• Inquiry Labs</li> <li>• Lab Reports</li> <li>• Common Formative Assessments</li> <li>• Common Summative Assessments,</li> <li>•</li> </ul>	<p><b>Quarter 3</b></p>	<p><b>Extension Activities / HONOR'S</b></p> <ul style="list-style-type: none"> <li>• Projects that are standard specific</li> <li>• Enrichment activities</li> <li>• Additional Critical Reading / literature readings related to the standard</li> <li>• Virtual Labs</li> <li>• MAP Distance Activity</li> <li>• CHI Square Analysis</li> <li>• <b>POGIL:</b> <i>Process Oriented Guided Inquiry Learning</i></li> <li>• <b>CER:</b> Claim Evidence &amp; Reasoning Data Analysis</li> </ul>
---	--	--	---	---	-------------------------	---

**Essential Guiding Questions**

- How are the characteristics of one generation passed to the next?  
What allows traits to be transmitted from parents to offspring?
- How does variation affect a population under selective pressure?

**Segment 5: Structure, Function and Growth (from cells to organisms)**

	<b>STANDARD DESCRIPTION</b>	<b>EXAMPLE RIGOR</b>	<b>PREREQUISITE / CONCURRENT / EXISTING SKILLS</b>	<b>COMMON ASSESSMENT</b>	<b>WHEN TAUGHT ?</b>	<b>EXTENSION STANDARDS</b>
	<p>What is the essential standard to be learned? Describe in student-friendly vocabulary.</p>	<p>What does proficient student work look like? Provide an example and/or description.</p>	<p>What prior / concurrent / existing knowledge, skills, and/or vocabulary is/are needed for a student to master this standard?</p>	<p>What assessment(s) will be used to measure student mastery?</p>	<p>When will this standard be taught?</p>	<p>What will we do when students have learned the essential standard(s)?</p>

<p><b>E.O. 9</b></p> <p><b>Hierarchical Organization of Interacting Systems &amp; Homeostasis</b></p>	<p>HS LS 1-1 Through HS LS 1-7</p> <p>Students will explain how the various parts of the body work together to maintain homeostasis.</p> <p>Students will describe the four common characteristics shared by Living things</p>	<p>Students can <b>describe</b> and <b>explain</b>:</p> <ul style="list-style-type: none"> <li>• The Characteristics of living things &amp; Biodiversity</li> <li>• How systems of cells, tissues, and organs function together to support the life processes in body systems.</li> </ul> <p>Through CER summary paragraphs, lab analysis, &amp; process activities.</p>	<p>Common Content Key Terms or Vocabulary for each standard:</p> <ul style="list-style-type: none"> <li>• Species</li> <li>• Energy</li> <li>• Living thing Stimulus</li> <li>• Systems</li> <li>• Homeostasis</li> <li>• Positive Feedback Loops</li> <li>• Negative Feedback</li> </ul> <p><b>Academic Vocabulary</b></p> <ul style="list-style-type: none"> <li>• Describe</li> <li>• Compare</li> <li>• Contrast</li> <li>• Differentiate</li> <li>• Explain</li> <li>• Hierarchy</li> </ul> <p><b>Focused Note taking Paragraph Summaries</b></p> <ul style="list-style-type: none"> <li>• CER Organizer</li> <li>• CER Summary</li> </ul> <p><b>Differentiated Critical Reading Strategies</b></p>	<p>Informal &amp; Formal Assessments</p> <ul style="list-style-type: none"> <li>• Student Portfolios &amp; or Interactive Notebooks</li> <li>• CER/Summary Paragraphs</li> <li>• Differentiated Critical Reading</li> <li>• Common Formative Assessment</li> <li>• Common Summative Assessment</li> </ul>	<p>Quarter 3</p>	<p>Extension Activities / HONOR'S</p> <ul style="list-style-type: none"> <li>• Projects that are standard specific</li> <li>• Enrichment activities</li> <li>• Additional Critical Reading / literature readings related to the standard</li> <li>• Virtual Labs</li> <li>• Models</li> <li>• <b>POGIL:</b> <i>Process Oriented Guided Inquiry Learning</i></li> <li>• <b>CER:</b> Claim Evidence &amp; Reasoning Data Analysis</li> </ul>
---	--	--	--	---	------------------	--

**Essential Guiding Questions**

- What happens if a cell in our body dies?
- How does the structure of DNA affect how cells look and behave?
- How do systems work in a multi-celled organism (emergent properties) and what happens if there is a change in the system?
- How do organisms survive even when there are changes in their environment?

<p><b>E.O. 10</b></p> <p><b>Cell Biology</b></p>	<p>HS LS 1-1 Through HS LS 1-7</p>	<p>Students are able to <b>investigate</b> <b>explanations</b> for the structure and function of cells as the basic units of</p>	<p>Common Content Key Terms or Vocabulary for each standard</p> <ul style="list-style-type: none"> <li>• Structure</li> <li>• Function</li> <li>• Prokaryotic</li> </ul>	<p>Informal &amp; Formal Assessments</p> <ul style="list-style-type: none"> <li>• Student Portfolios &amp; or Interactive Notebooks</li> </ul>	<p>Quarter 3</p>	<p>Extension Activities / HONOR'S</p> <ul style="list-style-type: none"> <li>• Projects that are standard specific</li> <li>• Enrichment activities</li> </ul>
--	------------------------------------	--	--	--	------------------	--

	Identify and describe the structure and function of organelles in plant and animal systems.	life, the hierarchical systems of organisms, and the role of specialized cells for maintenance and growth.  <b>Through CER summary paragraphs, lab analysis, &amp; process activities.</b>	<ul style="list-style-type: none"> <li>• Eukaryotic</li> <li>• Nucleus</li> <li>• Mitochondria</li> <li>• Chloroplast</li> <li>• Cell membrane</li> <li>• Active transport</li> <li>• Passive transport</li> <li>• Diffusion'</li> <li>• Osmosis</li> </ul> <b>Academic Language</b> <ul style="list-style-type: none"> <li>• Describe</li> <li>• Explain</li> <li>• Differentiate</li> <li>• Compare/Contrast</li> <li>• Investigate</li> </ul> <b>Focused Note taking Paragraph Summaries</b> <ul style="list-style-type: none"> <li>• CER Organizer</li> <li>• CER Summary</li> </ul> <b>Differentiated Critical Reading Strategies</b> <b>Microscope Technique</b>	<ul style="list-style-type: none"> <li>• CER/Summary Paragraphs</li> <li>• Differentiated Critical Reading</li> <li>• Inquiry Labs</li> <li>• Lab Reports</li> <li>• Common Formative Assessments</li> <li>• Common Summative Assessments,</li> <li>•</li> </ul>		<ul style="list-style-type: none"> <li>• Additional Critical Reading / literature readings related to the standard</li> <li>• Virtual Labs</li> <li>• Models</li> <li>• <b>POGIL:</b> <i>Process Oriented Guided Inquiry Learning</i></li> <li>• <b>CER:</b> Claim Evidence &amp; Reasoning Data Analysis</li> </ul>
--	---	--	---	--	--	--

**Essential Guiding Questions**

- What happens if a cell in our body dies?
- How does the structure of DNA affect how cells look and behave?
- How do systems work in a multi-celled organism (emergent properties) and what happens if there is a change in the system?
- How do organisms survive even when there are changes in their environment?

<b>E.O. 11 Molecular Biology</b>	HS-LS1-4, HS LS 3-1, LS 1.A, LS 1.B, LS 3.A & LS 3.B  Model the process of cell division in	Students can <b>construct</b> a <b>model</b> to <b>illustrate</b> the <b>life cycle of a cell</b> , including explanations based on evidence of how the <b>structure of DNA</b> determines the	<b>Common Content Key Terms or Vocabulary for each standard</b> <ul style="list-style-type: none"> <li>• Nucleotides</li> <li>• DNA</li> <li>• RNA</li> <li>• Cell Cycle</li> <li>• DNA Synthesis / Replication</li> </ul>	<b>Informal &amp; Formal Assessments</b> <ul style="list-style-type: none"> <li>• Student Portfolios &amp; or Interactive Notebooks</li> <li>• CER/Summary Paragraphs</li> <li>• Differentiated</li> </ul>	Quarter 4	<b>Extension Activities / HONOR'S</b> <ul style="list-style-type: none"> <li>• Projects that are standard specific</li> <li>• Enrichment activities</li> <li>• Additional Critical Reading / literature</li> </ul>
--------------------------------------	---	--	--	--	-----------	--



	<p>maintaining and reproducing organisms, including the process of protein synthesis.</p>	<p><b>structure of proteins</b> which carry out essential functions of life, and including role of <b>cellular division (mitosis)</b> and differentiation in producing and maintaining complex organisms.</p> <p><b>Through CER summary paragraphs, lab analysis, &amp; process activities.</b></p>	<ul style="list-style-type: none"> <li>● Mitosis</li> <li>● Protein synthesis</li> <li>● Transcription</li> <li>● Translation</li> <li>● Mutation</li> <li>● Decomposition</li> <li>● Differentiation</li> <li>● Crossing Over</li> </ul> <p><b>Academic Language</b></p> <ul style="list-style-type: none"> <li>● Describe</li> <li>● Explain</li> <li>● Differentiate</li> <li>● Compare/Contrast</li> <li>● Construct</li> <li>● Determine</li> <li>● Illustrate</li> <li>● Model</li> </ul> <p><b>Focused Note taking Paragraph Summaries</b></p> <ul style="list-style-type: none"> <li>● CER Organizer</li> <li>● CER Summary</li> </ul> <p><b>Differentiated Critical Reading Strategies</b></p>	<p>Critical Reading</p> <ul style="list-style-type: none"> <li>● Inquiry Labs</li> <li>● Lab Reports</li> <li>● Common Formative Assessments</li> <li>● Common Summative Assessments,</li> <li>● MAP Assessment Results</li> </ul>		<p>readings related to the standard</p> <ul style="list-style-type: none"> <li>● Virtual Labs</li> <li>● Biotechnology Inquiry Labs</li> <li>● <b>POGIL:</b> <i>Process Oriented Guided Inquiry Learning</i></li> <li>● <b>CER:</b> Claim Evidence &amp; Reasoning Lab Data Analysis</li> </ul>
--	---	---	---	--	--	---

**Essential Guiding Questions**

- What happens if a cell in our body dies?
- How does the structure of DNA affect how cells look and behave?
- How do systems work in a multi-celled organism (emergent properties) and what happens if there is a change in the system?
- How do organisms survive even when there are changes in their environment?

<p><b>E.O. 11</b></p> <p><b>Stem Cell Debate</b></p>	<p>ETS 1-3</p> <p><b>HONORS Expectation</b> Inquire about and address the pros and cons of a controversial topic</p>	<p>Students can <b>engage</b> in argument from Evidence using <b>Philosophical Chairs and CER.</b></p>	<p><b>Common Content Key Terms or Vocabulary for each standard</b></p> <ul style="list-style-type: none"> <li>● Controversial</li> <li>● Debate</li> </ul> <p><b>Academic Language</b></p> <ul style="list-style-type: none"> <li>● Describe</li> <li>● Explain</li> </ul>	<p><b>Informal &amp; Formal Assessments</b></p> <ul style="list-style-type: none"> <li>● Student Portfolios &amp; or Interactive Notebooks</li> <li>● CER/Summary Paragraphs</li> <li>● Differentiated</li> </ul>	<p>Quarter 4</p>	<p><b>Extension Activities / HONOR'S</b></p> <ul style="list-style-type: none"> <li>● Projects that are standard specific</li> <li>● Enrichment activities</li> <li>● Additional Critical Reading / literature</li> </ul>
--	--	--	--	---	------------------	---

			<ul style="list-style-type: none"> <li>• Differentiate</li> <li>• Compare/Contrast</li> <li>• Engage</li> <li>• Inquire</li> <li>• Address</li> </ul> <p><b>Focused Note taking</b></p> <p><b>Paragraph Summaries</b></p> <ul style="list-style-type: none"> <li>• CER Organizer</li> <li>• CER Summary</li> </ul> <p><b>Differentiated Critical Reading Strategies</b></p>	<p>Critical Reading</p> <ul style="list-style-type: none"> <li>• Inquiry Labs</li> <li>• Lab Reports</li> <li>• Common Formative Assessments</li> <li>• Common Summative Assessments,</li> </ul>		<p>readings related to the standard</p> <ul style="list-style-type: none"> <li>• Virtual Labs</li> <li>• Socratic Seminars</li> <li>• AVID Graphic Organizers: <b>NEWS, DDDE, Read &amp; Recall</b></li> <li>• <b>POGIL:</b> <i>Process Oriented Guided Inquiry Learning</i></li> <li>• <b>CER:</b> Data Analysis</li> </ul>
--	--	--	---	--	--	--

### Essential Guiding Questions

- What happens if a cell in our body dies?
- How does the structure of DNA affect how cells look and behave?
- How do systems work in a multi-celled organism (emergent properties) and what happens if there is a change in the system?
- How do organisms survive even when there are changes in their environment?

<p><b>E.O. 11</b></p> <p><b>Microbiology &amp; Biotechnology</b></p>	<p>HS-LS1-1</p> <p>The genetic composition of cells can be altered by incorporation of exogenous DNA into the cells.</p>	<p>Students can <b>investigate</b> transformation of bacteria techniques, <b>calculate</b> transformation efficiency, <b>model</b> recombinant DNA and <b>perform</b> DNA Fingerprinting Analysis using Gel Electrophoresis Gels.</p>	<p><b>Common Content Key Terms or Vocabulary for each standard</b></p> <ul style="list-style-type: none"> <li>• Pathogens</li> <li>• Bacteria</li> <li>• Colonies</li> <li>• DNA</li> <li>• Fingerprinting</li> </ul> <p><b>Academic Language</b></p> <ul style="list-style-type: none"> <li>• Describe</li> <li>• Explain</li> </ul>	<p><b>Informal &amp; Formal Assessments</b></p> <ul style="list-style-type: none"> <li>• Student Portfolios &amp; or Interactive Notebooks</li> <li>• CER/Summary Paragraphs</li> <li>• Differentiated Critical Reading</li> <li>• Inquiry Labs</li> <li>• Lab Reports</li> <li>• Common</li> </ul>	<p>Quarter 4</p>	<p><b>Extension Activities / HONORS</b></p> <ul style="list-style-type: none"> <li>• Projects that are standard specific</li> <li>• Enrichment activities</li> <li>• Additional Critical Reading / literature readings related to the standard</li> <li>• Virtual Labs</li> <li>• Biotechnology Inquiry Labs</li> </ul>
--	--	---	---	---	------------------	---

		Through CER summary paragraphs, lab analysis, & process activities.	<ul style="list-style-type: none"> <li>• Differentiate</li> <li>• Compare/Contrast</li> <li>• Model</li> <li>• Perform</li> <li>• Investigate</li> <li>• Analyze</li> </ul> <p><b>Focused Note taking Paragraph Summaries</b></p> <ul style="list-style-type: none"> <li>• CER Organizer</li> <li>• CER Summary</li> </ul> <p><b>Differentiated Critical Reading Strategies</b></p>	<p>Formative Assessments</p> <ul style="list-style-type: none"> <li>• Common Summative Assessments,</li> </ul>		<ul style="list-style-type: none"> <li>• More Gel Electrophoresis Activities</li> <li>• DNA Fragment Maps</li> <li>• <b>POGIL:</b> <i>Process Oriented Guided Inquiry Learning</i></li> <li>• <b>CER:</b> Claim Evidence &amp; Reasoning Data Analysis</li> </ul>
--	--	---	---	--	--	---

### Essential Guiding Questions

- What happens if a cell in our body dies?
- How does the structure of DNA affect how cells look and behave?
- How do systems work in a multi-celled organism (emergent properties) and what happens if there is a change in the system?
- How do organisms survive even when there are changes in their environment?

## Segment 6: Ecosystem Stability and the Response to Climate Change

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

	<p>What is the essential standard to be learned? Describe in student-friendly vocabulary.</p>	<p>What does proficient student work look like? Provide an example and/or description.</p>	<p>What prior / concurrent / existing knowledge, skills, and/or vocabulary is/are needed for a student to master this standard?</p>	<p>What assessment(s) will be used to measure student mastery?</p>	<p>When will this standard be taught?</p>	<p>What will we do when students have learned the essential standard(s)?</p>
<p><b>E.O. 12</b> <b>Changes in the Environment and Human Impact on the Environment</b></p>	<p>HS LS 2-1 Through HS LS 2-8 &amp; HS LS-4-6 LS 2.A through LS 2-D &amp; LS 4.D</p> <p>Explain interactions and the movement of energy between organisms and the environment.</p>	<p>Students can <b>investigate</b> the role of <b>animal &amp; human behavior</b> on survival of individuals and species and the environment.</p> <p>Students can <b>model</b> of interactions among organisms and how those interactions influence the <b>dynamics of ecosystems</b> and the environment.</p> <p>Students can <b>evaluate</b> and <b>adapt</b> existing <b>renewable and nonrenewable resources as they relate to ecological sustainability</b>.</p> <p>Through CER summary paragraphs, lab analysis, process</p>	<p><b>Common Key Terms or Vocabulary for each standard</b></p> <ul style="list-style-type: none"> <li>Resources</li> <li>Climate change</li> <li>Nitrogen</li> <li>Atmosphere</li> <li>Hydrosphere</li> <li>Geosphere</li> <li>Human impacts</li> </ul> <p><b>Academic Language</b></p> <ul style="list-style-type: none"> <li>Describe</li> <li>Explain</li> <li>Differentiate</li> <li>Compare/Contrast</li> <li>Demonstrate</li> <li>Investigate</li> <li>Mitigate</li> </ul> <p><b>Focused Note taking Paragraph Summaries</b></p> <ul style="list-style-type: none"> <li>CER Organizer</li> <li>CER Summary</li> </ul> <p><b>Differentiated Critical Reading Strategies</b></p>	<p><b>Informal &amp; Formal Assessments</b></p> <ul style="list-style-type: none"> <li>Student Portfolios &amp; or Interactive Notebooks</li> <li>CER/Summary Paragraphs</li> <li>Differentiated Critical Reading</li> <li>Inquiry Labs</li> <li>Lab Reports</li> <li>Common Formative Assessments</li> <li>Common Summative Assessments,</li> </ul>	<p>Quarter 4</p>	<p><b>Extension Activities / HONOR'S</b></p> <ul style="list-style-type: none"> <li>Projects that are standard specific</li> <li>Enrichment activities</li> <li>Additional Critical Reading / literature readings related to the standard</li> <li>Virtual Labs</li> <li>Models</li> <li><b>POGIL: Process Oriented Guided Inquiry Learning</b></li> <li><b>CER: Claim Evidence &amp; Reasoning Data Analysis</b></li> </ul>

activities, & a research project and presentation.

### Essential Guiding Questions

- What affects changes in ecosystems that ultimately affect populations?
- What are the changes that are happening in the climate and what effects are those having on life?
- How are human activities impacting Earth’s systems and how does that affect life on Earth?
- What can humans do to mitigate their negative impact on the environment?

## ELA Connection

<p><b>RST .11-12.1</b> <b>WHST .9-12.2</b> <b>(HS-LS1-1)</b></p>	<p><b>Cite specific textual evidence</b> to support analysis of science and technical texts and annotating distinctions that the author makes and to any gaps or inconsistencies in data.</p>	<p><b>Students can Write</b> informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <p><b>Through CER/Summary Paragraphs and Philosophical Chairs</b></p>	<p><b>Academic Language</b></p> <ul style="list-style-type: none"> <li>● Describe</li> <li>● Explain</li> <li>● Differentiate</li> <li>● Compare/Contrast</li> <li>● Marking text</li> <li>● Charting text</li> <li>● Interacting with text</li> <li>● Annotating text</li> </ul> <p><b>Focused Note taking Paragraph Summaries</b></p> <ul style="list-style-type: none"> <li>● CER Organizer</li> <li>● CER Summary</li> </ul> <p><b>Differentiated Critical Reading Strategies</b></p>	<p><b>Informal &amp; Formal Assessments</b></p> <ul style="list-style-type: none"> <li>● Student Portfolios &amp; or Interactive Notebooks</li> <li>● CER/Summary Paragraphs</li> <li>● Differentiated Critical Reading</li> <li>● Inquiry Labs</li> <li>● Lab Reports</li> <li>● Common Formative Assessments</li> </ul>	<p><b>Quarters 1-4</b></p>	<p><b>Extension Activities / HONOR’S</b></p> <ul style="list-style-type: none"> <li>● Projects that are standard specific</li> <li>● Enrichment activities</li> <li>● Additional literature readings related to the standard</li> <li>● Online / Digital Critical Readings-- Marking and Charting Text and Rhetorical Precis.</li> </ul>
--	---	---	---	---	----------------------------	--