

**Core High School Life Science  
Standards, Supporting Skills, and Examples**

**Indicator 1: Understand the fundamental structures, functions, classifications, and mechanisms found in living things.**

<b>Bloom's Taxonomy Level</b>	<b>Standard, Supporting Skills, and Examples</b>
(Analysis)	<p><b>9-12.L.1.1. Students are able to relate cellular functions and processes to specialized structures within cells.</b></p> <ul style="list-style-type: none"> <li>• Transport Examples: cell membrane, homeostasis</li> <li>• Photosynthesis and respiration Examples: ATP-ADP energy cycle Role of enzymes Mitochondria Chloroplasts</li> <li>• Storage and transfer of genetic information Examples: replication, transcription, and translation</li> <li>• Cell life cycles Examples: somatic cells (mitosis), germ cells (meiosis)</li> </ul>
(Application)	<p><b>9-12.L.1.2. Students are able to classify organisms using characteristics and evolutionary relationship of major taxa.</b></p> <ul style="list-style-type: none"> <li>• Kingdoms Examples: animals, plants, fungi, protista, monera</li> <li>• Phyla Examples: invertebrates, vertebrates, divisions of plants</li> </ul> <p>Note: There is an ongoing scientific debate about the number of groupings and which organisms should be included in each.</p>
(Analysis)	<p><b>9-12.L.1.3. Students are able to identify structures and function relationships within major taxa.</b></p> <p><b>Examples:</b> Relate how the layers in a leaf support leaf function. Interaction of agonist and antagonist muscles to support bone movement</p>

**Indicator 2: Analyze various patterns and products of natural and induced biological change.**

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Application)	<p><b>9-12.L.2.1. Students are able to predict inheritance patterns using a single allele.</b></p> <ul style="list-style-type: none"> <li>• Solve problems involving simple dominance, co-dominance, and sex-linked traits using Punnett squares for F1 and F2 generations. Examples: color blindness, wavy hair</li> <li>• Discuss disorders resulting from alteration of a single gene. Example: hemophilia, cystic fibrosis</li> </ul>
(Synthesis)	<p><b>9-12.L.2.2. Students are able to describe how genetic recombination, mutations, and natural selection lead to adaptations, evolution, extinction, or the emergence of new species.</b></p> <p><b>Examples:</b> behavioral adaptations, environmental pressures, allele variations, bio-diversity</p> <ul style="list-style-type: none"> <li>• Use comparative anatomy to support evolutionary relationships.</li> </ul>

**Indicator 3: Analyze how organisms are linked to one another and the environment.**

Bloom's Taxonomy Level	Standard, Supporting Skills, and Examples
(Comprehension)	<p><b>9-12.L.3.1. Students are able to identify factors that can cause changes in stability of populations, communities, and ecosystems.</b></p> <ul style="list-style-type: none"> <li>• Define populations, communities, ecosystems, niches and symbiotic relationships.</li> <li>• Predict the results of biotic and abiotic interactions.</li> </ul> <p>Examples:</p> <p>Responses to changing of the seasons Tolerances (temperature, weather, climate) Dormancy and migration Fluctuation in available resources (water, food, shelter) Human activity Biogeochemical cycles</p>

	<p>Energy flow          Cooperation and competition in ecosystems          Response to external stimuli</p>
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**Core High School Life Science  
 Performance Descriptors**

<b>Advanced</b>	<p><b>High school students performing at the advanced level:</b></p> <ul style="list-style-type: none"> <li>• explain the steps of photophosphorylation and the Calvin Cycle;</li> <li>• analyze chemical reaction and chemical processes involved in the Calvin Cycle and Krebs Cycle;</li> <li>• predict the function of a given structure;</li> <li>• predict the outcome of changes in the cell cycle;</li> <li>• explain how protein production is regulated;</li> <li>• predict how homeostasis is maintained within living systems;</li> <li>• predict how traits are transmitted from parents to offspring;</li> <li>• construct an original dichotomous key.</li> </ul>
<b>Proficient</b>	<p><b>High school students performing at the proficient level:</b></p> <ul style="list-style-type: none"> <li>• describe and give examples of chemical reactions required to sustain life (hydrolysis, dehydration synthesis, photosynthesis, cellular respiration, ADP/ATP, role of enzymes);</li> <li>• describe the relationship between structure and function (cells, tissues, organs, organ systems, and organisms);</li> <li>• compare and contrast the cell cycles in somatic and germ cells;</li> <li>• tell how DNA determines protein formation;</li> <li>• explain how homeostasis is maintained within living systems;</li> <li>• explain how traits are transmitted from parents to offspring;</li> <li>• predict the impact of genetic changes in populations (mutation, natural selection and artificial selection, adaptation/extinction);</li> <li>• predict how life systems respond to changes in the environment;</li> <li>• classify organisms using a dichotomous key.</li> </ul>
<b>Basic</b>	<p><b>High school students performing at the basic level:</b></p> <ul style="list-style-type: none"> <li>• name chemical reactions required to sustain life (hydrolysis, dehydration synthesis, photosynthesis, cellular respiration, ADP/ATP, role of enzymes);</li> <li>• recognize that different structures perform different functions;</li> </ul>

	<ul style="list-style-type: none"> <li>• describe the life cycle of somatic cells;</li> <li>• identify DNA as the structure that carries the genetic code;</li> <li>• define homeostasis;</li> <li>• identify that genetic traits can be transmitted from parents to offspring;</li> <li>• know the purpose of a dichotomous key.</li> </ul>
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**Core High School Life Science  
ELL Performance Descriptors**

<b>Proficient</b>	<p><b>High school ELL students performing at the proficient level:</b></p> <ul style="list-style-type: none"> <li>• name chemical reactions involved in photosynthesis and cellular respiration;</li> <li>• recognize the structure and function of the cell membrane, nucleus, mitochondria, and chloroplasts;</li> <li>• describe the phases of mitosis and meiosis;</li> <li>• identify DNA as the structure that carries the genetic code;</li> <li>• recognize that homeostasis occurs in cells;</li> <li>• identify that genetic traits can be transmitted from parents to offspring;</li> <li>• know the purpose of a dichotomous key.</li> </ul>
<b>Intermediate</b>	<p><b>High school ELL students performing at the intermediate level:</b></p> <ul style="list-style-type: none"> <li>• label chemical reactions involved in photosynthesis and cellular respiration;</li> <li>• label the cell membrane, nucleus, mitochondria, and chloroplasts in a cell diagram;</li> <li>• label the phases of mitosis and meiosis in a diagram;</li> <li>• recognize that materials are transported across the cell membrane;</li> <li>• recognize that genetic traits can be transmitted from parents to offspring;</li> <li>• sort collections of animal/plant photos into appropriate groups.</li> </ul>
<b>Basic</b>	<p><b>High school ELL students performing at the basic level:</b></p> <ul style="list-style-type: none"> <li>• recognize chemical reactions involved in photosynthesis and cellular respiration;</li> <li>• identify the cell membrane, nucleus, mitochondria, and chloroplasts in a cell diagram;</li> <li>• identify the phases of mitosis and meiosis in a diagram;</li> <li>• know the function of a cell membrane;</li> <li>• identify genetic traits (eye color, hair color);</li> <li>• recognize that animal/plants are sorted into groups.</li> </ul>

<b>Emergent</b>	<b>High school ELL students performing at the emergent level:</b> <ul style="list-style-type: none"><li>• use correct pronunciation of science words;</li><li>• use non-verbal communication to express scientific ideas.</li></ul>
<b>Pre-emergent</b>	<b>High school ELL students performing at the pre-emergent level:</b> <ul style="list-style-type: none"><li>• observe and model appropriate cultural and learning behaviors from peers and adults;</li><li>• listen to and observe comprehensible instruction and communicate understanding non-verbally.</li></ul>

