

BIOLOGY PREREQUISITE HIGH SCHOOL CONTENT EXPECTATIONS (34)
Cross-Referenced to the SCIENCE 5th -7th Grade Level Content Expectations (GLCEs)

Prerequisite HSCE	Grade Level(s)	5-7 Content Statement	5-7 Science Content Expectation
L2.p1A Distinguish between living and nonliving systems. <i>(prerequisite)</i>	6	<i>L.EC.M.3 Biotic and Abiotic Factors- The number of organisms and populations an ecosystem can support depends on the biotic (living) resources available and abiotic (nonliving) factors, such as quality of light and water, range of temperatures and soil composition.</i>	L.EC.06.31 Identify the living (biotic) and nonliving (abiotic) components of an ecosystem.
L2.p1B Explain the importance of both water and the element carbon to cells. <i>(prerequisite)</i>	7	<i>L.OL.M.6 Photosynthesis- Plants are producers; they use the energy from light to make sugar molecules from the atoms of carbon dioxide and water.</i>	L.OL.07.62 Explain that carbon dioxide and water are used to produce carbohydrates, proteins, and fats.
L2.p1C Describe growth and development in terms of increase in cell number, cell size, and/or cell products. <i>(prerequisite)</i>	7	<i>L.OL.M.3- Growth and Development- Following fertilization, cell division produces a small cluster of cells that then differentiate by appearance and function to form the basic tissue of an embryo.</i>	L.OL.07.31 Describe growth and development in terms of increase of cell number and/or cell size.
L2.p1D Explain how the systems in a multicellular organism work together to support the organism. <i>(prerequisite)</i>	5	<i>L.OL.M.4 Animal Systems- Multicellular organisms may have specialized systems that perform functions which serve the needs of the organism.</i>	L.OL.05.41 Identify the general purpose of selected animal systems (digestive, circulatory, respiratory, skeletal, muscular, nervous, excretory, and reproductive). L.OL.05.42 Explain how animal systems (digestive, circulatory, respiratory, skeletal, muscular, nervous, excretory, and reproductive) work together to perform selected activities.
L2.p1E Compare and contrast how different organisms accomplish similar functions (e.g., obtain oxygen for respiration, and excrete waste). <i>(prerequisite)</i>	5	<i>L.OL.M.4 Animal Systems- Multicellular organisms may have specialized systems that perform functions which serve the needs of the organism.</i>	<i>Poor alignment @ 5th Grade, Concept presented with minimal alignment only at the cellular level in 7th Grade.</i> L.OL.05.41 Identify the general purpose of selected animal systems (digestive, circulatory, respiratory, skeletal, muscular, nervous, excretory, and reproductive). L.OL.05.42 Explain how animal systems (digestive, circulatory, respiratory, skeletal, muscular, nervous, excretory, and reproductive) work together to perform selected activities.

L2.p2A Describe how organisms sustain life by obtaining, transporting, transforming, releasing, and eliminating matter and energy. <i>(prerequisite)</i>	5	L.OL.M.4 Animal Systems- Multicellular organisms may have specialized systems that perform functions which serve the needs of the organism.	L.OL.05.41 Identify the general purpose of selected animal systems (digestive, circulatory, respiratory, skeletal, muscular, nervous, excretory, and reproductive). L.OL.05.42 Explain how animal systems (digestive, circulatory, respiratory, skeletal, muscular, nervous, excretory, and reproductive) work together to perform selected activities.
L2.p2B Describe the effect of limiting food to developing cells. <i>(prerequisite)</i>	None		
L2.p3A Explain the significance of carbon in organic molecules. <i>(prerequisite)</i>	7	P.PM.M.2 Elements and Compounds-	*Poor alignment with the concept of “organic molecules.” P.PM.07.23 Illustrate the structure of molecules using models or drawings (water, carbon dioxide, salt).
L2.p3B Explain the origins of plant mass. <i>(prerequisite)</i>	7	L.OL.M.6 Photosynthesis- Plants are producers; they use the energy from light to make sugar molecules from the atoms of carbon dioxide and water. Plants use these sugars along with minerals from the soil to form fats, proteins, and carbohydrates. These products can be used immediately, incorporated into the cells of a plant as the plant grows, or stored for later use.	L.OL.07.63 Describe evidence that plants make, use and store food.
L2.p3C Predict what would happen to plants growing in low carbon dioxide atmospheres. <i>(prerequisite)</i>	None		
L2.p3D Explain how the roots of specific plants grow. <i>(prerequisite)</i>	None		“Roots” mentioned in 3rd Grade, but no “root growth” in GLCEs
L2.p4A Classify different organisms based on how they obtain energy for growth and development. <i>(prerequisite)</i>	6	L.OL.M.5 Producers, Consumers, and Decomposers- All animals, including humans, are consumers that meet their energy by eating other organisms or their products. Consumers break down the structures of the organisms they eat to	L.OL.06.51 Classify organisms (producers, consumers, and decomposers) based on their source of energy for growth and development.

		<i>make the materials they need to grow and function. Decomposers, including bacteria and fungi, use dead organisms or their products to meet their energy needs.</i>	
L2.p4B Explain how an organism obtains energy from the food it consumes. <i>(prerequisite)</i>	6	L.OL.M.5 Producers, Consumers, and Decomposers- <i>All animals, including humans, are consumers that meet their energy by eating other organisms or their products. Consumers break down the structures of the organisms they eat to make the materials they need to grow and function. Decomposers, including bacteria and fungi, use dead organisms or their products to meet their energy needs.</i>	L.OL.06.52 Distinguish between the ways in which consumers and decomposers obtain energy.
L2.p5A Recognize the six most common elements in organic molecules (C, H, N, O, P, S). <i>(prerequisite)</i>	None		
L2.p5B Identify the most common complex molecules that make up living organisms. <i>(prerequisite)</i>	None	“Sugar molecules” are mentioned in 7 th grade.	
L2.p5C Predict what would happen if essential elements were withheld from developing cells. <i>(prerequisite)</i>	None		
L3.p1A Provide examples of a population, community, and ecosystem. <i>(prerequisite)</i>	6	L.EC.M.1 Interactions of Organisms- <i>Organisms of one species form a population. Populations of different organisms interact and form communities. Living communities and nonliving factors that interact with them form ecosystems.</i>	L.EC.06.11 List examples of populations, communities, and ecosystems including the Great Lakes region.
L3.p2A Describe common relationships among organisms and provide examples of producer/consumer, predator/prey, or parasite/host relationship. <i>(prerequisite)</i>	6	L.EC.M.2 Relationships of Organisms- <i>Two types of organisms may interact with one another in several ways: They may be in a producer/consumer, predator/prey, or parasite/host relationship. Some organisms may scavenge or decompose another. Relationships may be competitive or mutually beneficial. Some species have</i>	L.EC.06.21 Describe common patterns of relationships between and among populations (competition, parasitism, symbiosis, predator/prey).

		become so adapted to each other that neither could survive without the other.	
L3.p2B Describe common ecological relationships between and among species and their environments (competition, territory, carrying capacity, natural balance, population, dependence, survival, and other biotic and abiotic factors). <i>(prerequisite)</i>	6	L.EC.M.3 Biotic and Abiotic Factors- <i>The number of organisms and populations an ecosystem can support depends on the biotic (living) resources available and abiotic (nonliving) factors, such as quality of light and water, range of temperatures and soil composition.</i>	“Competition,” “Carrying capacity” not mentioned. L.EC.06.31 Identify the living (biotic) and nonliving (abiotic) components of an ecosystem. L.EC.06.32 Identify the factors in an ecosystem that influence changes in population size.
L3.p2C Describe the role of decomposers in the transfer of energy in an ecosystem. <i>(prerequisite)</i>	6	L.OL.M.5 Producers, Consumers, and Decomposers- <i>All animals, including humans, are consumers that meet their energy by eating other organisms or their products. Consumers break down the structures of the organisms they eat to make the materials they need to grow and function. Decomposers, including bacteria and fungi, use dead organisms or their products to meet their energy needs.</i>	L.OL.06.52 Distinguish between the ways in which consumers and decomposers obtain energy.
L3.p2D Explain how two organisms can be mutually beneficial and how that can lead to interdependency. <i>(prerequisite)</i>	6	L.EC.M.2 Relationships of Organisms-	L.EC.06.21 Describe common patterns of relationships between and among populations (competition, parasitism, symbiosis, predator/prey).
L3.p3A Identify the factors in an ecosystem that influence fluctuations in population size. <i>(prerequisite)</i>	6	L.EC.M.3 Biotic and Abiotic Factors-	L.EC.06.32 Identify the factors in an ecosystem that influence changes in population size.
L3.p3B Distinguish between the living (biotic) and nonliving (abiotic) components of an ecosystem. <i>(prerequisite)</i>	6	L.EC.M.3 Biotic and Abiotic Factors-	L.EC.06.31 Identify the living (biotic) and nonliving (abiotic) components of an ecosystem.
L3.p3C Explain how biotic and abiotic factors cycle in an ecosystem (water, carbon, oxygen, and nitrogen). <i>(prerequisite)</i>			Poor alignment: Rock cycle is mentioned in 6th grade Water cycle is mentioned in 7th grade

<p>L3.p3D Predict how changes in one population might affect other populations based upon their relationships in a food web. <i>(prerequisite)</i></p>	6	<p>L.EC.M.2 Relationships of Organisms-</p>	<p>L.EC.06.23 Predict how changes in one population might affect other populations based upon their relationships in the food web.</p>
<p>L3.p4A Recognize that, and describe how, human beings are part of Earth's ecosystems. Note that human activities can deliberately or inadvertently alter the equilibrium in ecosystems. <i>(prerequisite)</i></p>	5-7	<p>L.EC.M.4 Environmental Impact of Organisms- All organisms (including humans) cause change in the environment where they live. Some of the changes are harmful to the organism or other organisms, whereas others are helpful. E.ES.M.4 Human Consequences- Human activities have changed the land, oceans, and atmosphere of the Earth resulting in the reduction of the number and variety of wild plants and animals sometimes causing extinction of species.</p>	<p>S.RS.05.17 Describe the effect humans and other organisms have on the balance in the natural world. S.RS.06.17 Describe the effect humans and other organisms have on the balance of the natural world. L.EC.06.41 Describe how human beings are part of the ecosystem of the Earth and that human activity can purposefully, or accidentally, alter the balance in ecosystems. S.RS.07.17 Describe the effect humans and other organisms have on the balance of the natural world. E.ES.07.41 Explain how human activities (surface mining, deforestation, overpopulation, construction and urban development, farming, dams, landfills, and restoring natural areas) change the surface of the Earth and affect the survival of organisms.</p>
<p>L4.p1A Compare and contrast the differences between sexual and asexual reproduction. <i>(prerequisite)</i></p>	7	<p>L.HE.M.2 Reproduction- Reproduction is a characteristic of all living systems; because no individual organism lives forever, reproduction is essential to the continuation of every species. Some organisms reproduce asexually. Other organisms reproduce sexually.</p>	<p>L.HE.07.21 Compare how characteristics of living things are passed on through generations, both asexually and sexually.</p>
<p>L4.p1B Discuss the advantages and disadvantages of sexual vs. asexual reproduction. <i>(prerequisite)</i></p>	7	<p>L.HE.M.2 Reproduction-</p>	<p>L.HE.07.22 Compare and contrast the advantages and disadvantages of sexual vs. asexual reproduction.</p>
<p>L4.p2A Explain that the traits of an individual are influenced by both the environment and the genetics of the individual. Acquired traits are not inherited; only genetic traits are inherited. <i>(prerequisite)</i></p>	5	<p>L.HE.M.1 Inherited and Acquired Traits – The characteristics of organisms are influenced by heredity and environment. For some characteristics, inheritance is more important; for other characteristics, interactions with the environment are more important.</p>	<p>L.HE.05.11 Explain that the traits of an individual are influenced by both the environment and the genetics of the individual. L.HE.05.12 Distinguish between inherited and acquired traits.</p>

<p>L5.p1A Define a species and give examples. <i>(prerequisite)</i></p>	<p>None</p>		<p>Poor alignment: The term “species” is used in 5th grade and thereafter, but no CE defining the term.</p>
<p>L5.p1B Define a population and identify local populations. <i>(prerequisite)</i></p>	<p>6</p>	<p>L.EC.M.1 Interactions of Organisms- Organisms of one species form a population. Populations of different organisms interact and form communities. Living communities and nonliving factors that interact with them form ecosystems.</p>	<p>L.EC.06.11 List examples of populations, communities, and ecosystems including the Great Lakes region.</p>
<p>L5.p1C Explain how extinction removes genes from the gene pool. <i>(prerequisite)</i></p>	<p>None</p>		<p>Poor alignment: “Extinction” is mentioned 5th – 7th grade, but always as a consequence of another effect, not as a cause of decreased genetic diversity.</p>
<p>L5.p1D Explain the importance of the fossil record. <i>(prerequisite)</i></p>	<p>5-6</p>	<p>E.ST.M.3 Fossils- Fossils provide important evidence of how life and environmental conditions have changed in a given location. E.ST.M.4 Geologic Time- Earth processes seen today (erosion, mountain building, and glacier movement) make possible the measurement of geologic time through methods such as observing rock sequences and using fossils to correlate the sequences at various locations.</p>	<p>L.EV.05.13 Describe how fossils provide evidence about how living things and environmental conditions have changed. E.ST.06.31 Explain how rocks and fossils are used to understand the age and geological history of the earth (timelines and relative dating, rock layers). E.ST.06.42 Describe how fossils provide important evidence of how life and environmental conditions have changed.</p>
<p>L5.p2A Explain, with examples, that ecology studies the varieties and interactions of living things across space while evolution studies the varieties and interactions of living things across time. <i>(prerequisite)</i></p>	<p>5</p>	<p>L.EV.M.1 Species Adaptation and Survival- Species with certain traits are more likely than others to survive and have offspring in particular environments. When an environment changes, the advantage or disadvantage of the species’ characteristics can change.</p>	<p>L.EV.05.13 Describe how fossils provide evidence about how living things and environmental conditions have changed.</p>