

Content/Academic Language						
FLDOE	adaptation diversity	embryology endosymbiosis**	evolution extinct species	fossil hominid	inherited trait mutation	natural selection species
Other	adaptive radiation allele frequency analogous structure behavioral isolation biogeography	bipedal bottleneck effect coacervate convergent evolution directional selection	disruptive selection divergent evolution fitness gene flow gene pool	genetic drift geographic isolation gradualism homologous structure molecular clock**	niche punctuated equilibrium reproductive isolation sexual selection speciation	spontaneous generation stabilizing selection temporal isolation variation vestigial structure

Topic 1: Origin of Life		
SC.912.L.15.8 Describe the scientific explanations of the origin of life on Earth (parent benchmark on Biology 1 EOC assessment).	Moderate	<ul style="list-style-type: none"> ● recognize that all life on Earth is composed of the same basic elements ● provide examples of evidence supporting scientific explanations for the origin of life on Earth <ul style="list-style-type: none"> ○ explain how basic compounds in the oceans and atmosphere combined to form the building blocks of life through a series of chemical reactions powered by energy (Oparin, Miller & Urey, Fox, Margulis) ○ recall that cells come from pre-existing cells (Pasteur)
**SC.912.L.14.5 Explain the evidence supporting the scientific theory of the origin of eukaryotic cells (endosymbiosis) (not assessed on Biology 1 EOC assessment).	High	<ul style="list-style-type: none"> ● recognize that aerobic bacteria became mitochondria & cyanobacteria became chloroplasts through the process of endosymbiosis ● discuss the evidence supporting the endosymbiotic theory: <ul style="list-style-type: none"> ○ mitochondria & chloroplasts contain DNA similar to bacterial DNA ○ mitochondria & chloroplasts have ribosomes whose size & structure closely resemble those of bacteria ○ mitochondria & chloroplasts reproduce by binary fission
SC.912.N.1.3 Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented (assessed as SC.912.L.15.1 on Biology 1 EOC assessment).	Low	<ul style="list-style-type: none"> ● recognize that scientific argumentation is a necessary part of scientific inquiry ● explain the role that scientific argumentation plays in the generation and validation of scientific knowledge ● discuss how the scientific explanations of the origins of life on Earth have developed over time through scientific argumentation & critical thinking

Topic 2: Evidence of Evolution

<p>SC.912.L.15.13 Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success (parent benchmark on Biology 1 EOC assessment).</p>	<p>Moderate</p>	<ul style="list-style-type: none"> ● define an adaptation as any characteristic or trait that increases fitness (the ability to survive & reproduce) ● recall that a heritable trait is a characteristic which is influenced by genes & can be passed from parent to offspring ● recognize that an adaptive heritable trait tends to become more common in a population ● explain how natural selection results in changes in the frequency of heritable traits in a population ● discuss how evolution by natural selection occurs if and only if there is variation in a heritable trait which contributes to differences in fitness
<p>SC.912.L.15.1 Explain how the scientific theory of evolution is supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observed evolutionary change (parent benchmark on Biology 1 EOC assessment).</p>	<p>High</p>	<ul style="list-style-type: none"> ● explain how the fossil record shows detailed evidence of the changes in living things over time ● discuss how comparative anatomy illustrates how various species on Earth evolved from common ancestors (vestigial, homologous, & analogous structures) ● recognize that the embryos of many organisms show similarities suggesting a common ancestor ● explain how species are distributed around Earth in a pattern reflecting their genetic relationships to one another ● discuss how the comparison of gene sequences has demonstrated similarities among different organisms
<p>**SC.912.L.15.2 Discuss the use of molecular clocks to estimate how long ago various groups of organisms diverged evolutionarily from one another (not assessed on Biology 1 EOC assessment).</p>	<p>Moderate</p>	<ul style="list-style-type: none"> ● recognize that molecular clocks are models that use mutation rates to measure evolutionary time ● explain how the more time that has passed since 2 species diverged from a common ancestor, the more mutations will have built up, and the more different the 2 species will be at the molecular level
<p>SC.912.L.15.10 Identify basic trends in hominid evolution from early ancestors six million years ago to modern humans, including brain size, jaw size, language, and manufacture of tools (assessed as SC.912.L.15.1 on Biology 1 EOC assessment).</p>	<p>Moderate</p>	<ul style="list-style-type: none"> ● explain how the increase in brain size led to the development of more complex tools, language and social interactions, and culture ● describe how the change in diet (plant-based to meat-based) led to a decrease in jaw size ● recognize that bipedalism and opposable thumbs gave hominids the ability to utilize tools ● explain and give examples of the evolutionary changes that have occurred in hominids
<p>SC.912.N.3.1 Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer (assessed as SC.912.L.14.1 on Biology 1 EOC assessment).</p>	<p>High</p>	<ul style="list-style-type: none"> ● explain why the theory of evolution is a scientific theory supported by evidence from multiple sources ● recognize the difference between theories & laws

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Topic 3: Evolutionary Change

<p>SC.912.L.15.14 Discuss mechanisms of evolutionary change other than natural selection such as genetic drift and gene flow (assessed as SC.912.L.15.13 on Biology 1 EOC assessment).</p>	<p>Moderate</p>	<ul style="list-style-type: none"> ● explain how a sudden environmental act that reduces the population leads to a loss of variation (genetic drift) ● describe how the movement of individuals into or out of the population leads to a change in variation (gene flow) ● discuss how mate choice is no longer based on chance or opportunity, but is instead selected based on some characteristic (nonrandom mating) ● evaluate data to determine what mechanisms may be occurring in a population & predict possible outcomes
<p>SC.912.L.15.15 Describe how mutation and genetic recombination</p>	<p>Moderate</p>	<ul style="list-style-type: none"> ● recognize that mutations and genetic recombination contribute to the variation of a population

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<p>increase genetic variation (assessed as SC.912.L.15.13 on Biology 1 EOC assessment).</p>		<ul style="list-style-type: none"> ● explain how mutations and genetic can affect an organism’s ability to survive and reproduce
<p>**SC.912.L.15.3 Describe how biological diversity is increased by the origin of new species and how it is decreased by the natural process of extinction (not assessed on Biology 1 EOC assessment).</p>	<p>Moderate</p>	<ul style="list-style-type: none"> ● explain how the introduction of a new species leads to increased diversity ● discuss how the extinction of a species decrease diversity
<p>SC.912.N.2.1 Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science) (assessed as SC.912.L.15.1 on Biology 1 EOC assessment).</p>	<p>High</p>	<ul style="list-style-type: none"> ● understand that science is based on empirical evidence but because it is a human endeavor, the processes, methods, and knowledge of science include subjectivity, as well as creativity & discovery ● explain how the mechanisms of evolutionary change are based on empirical evidence