

Biology Curriculum Map

Life science focuses on the patterns, processes, and relationships of living organisms. At the high school level, students apply concepts learned in earlier grades to real-world situations and investigations using the science and engineering practices to fully explore phenomena and to develop solutions to societal problems related to food, energy, health, and environment. The field of life science is rapidly advancing and new technology and information related to the study of life processes is being developed daily. Students in high school should have access to up-to-date information in the field while simultaneously gaining understanding of the historical developments which shaped today's understandings within the field. The standards for life science encompass the areas of cells and organisms; ecosystems, interactions, energy and dynamics; heredity; and biological diversity. Like earth and space sciences and physical sciences, "connections" with the life science standards allow educators to make connections across scientific disciplines. The essential standards are those that every high school student is expected to know and understand. Plus standards in life science are designed to extend the concepts learned in the essential standards to prepare students for entry level college courses.

Notes:

- The standards referenced in this document can be found linked [here](#).
- The standard number is designed for recording purposes and does not imply instructional sequence of importance.
- The essential standards are those that every high school student is expected to know and understand.
- Plus standards in life science are designed to extend the concepts learned in the essential standards to prepare students for entry level college courses.
- In all disciplines, educators should incorporate scientific measurement skills appropriate to that discipline.

Unit #	Unit Title	Key Content	Standards
1	Ecology	<ul style="list-style-type: none"> ● Transfer of matter and energy within an ecosystem and interactions between species ● The relationship between limiting factors and carrying capacity ● How environmental changes impact biodiversity ● Cycling of matter and flow of energy through trophic levels in an ecosystem 	Essential HS.L2U1.19 Plus HS+B.L2U1.1 Plus HS+B.L2U1.3
2	The Cell	<ul style="list-style-type: none"> ● Cellular organization, structure, and function allow organisms to maintain homeostasis 	Essential HS.L1U1.20 Plus HS+B.L1U1.5

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		<ul style="list-style-type: none"> • Cellular function and the diversity of protein functions. • Transport mechanisms function in cells. • Hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal) • Interdependency and interactions between cellular organelles. 	Plus HS+B.L1U1.6 Plus HS+B.L1U1.7 Plus HS+B.L1U1.4
3	Cellular Energy	<ul style="list-style-type: none"> • Photosynthesis and cellular respiration; flow of energy and cycling of matter • Matter and energy and chemical elements, chemical reactions, and systems of interacting molecules • Photosynthesis, cellular respiration, and metabolic processes 	Essential HS.L2U1.21 Essential HS.L2U1.19 Plus HSB.L2U1.8
4	Cellular Reproduction	<ul style="list-style-type: none"> • How organisms grow and maintain complex interconnected systems by cellular division (mitosis) • How a cell copies genetic information to make new cells during asexual reproduction (mitosis). 	Essential HS.L1U1.22 Plus HS+B.L1U1.9
5	Genetics and Biotech	<ul style="list-style-type: none"> • Abnormal cell function • Sexual reproduction • Genetic variation • Causes and implications of DNA mutation • Implications of current genetic technology • Explain the variation that occurs through meiosis • Calculate the distribution of expressed traits in a population • How the structure of DNA and RNA determine 	Essential HS.L1U3.23 Essential HS.L3U1.24 Essential HS.L3U1.25 Essential HS.L3U3.26 Plus HS+B.L3U1.10 Plus HS+B.L3U1.11 Plus HS+B.L3U1.12

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		<p>the structure of proteins that perform essential life functions</p> <ul style="list-style-type: none"> • Mutations and genetic variation 	
6	Change Over Time	<ul style="list-style-type: none"> • Change in genetic composition of a population over successive generations • Natural selection and adaptation 	<p>Essential HS.L4U1.28 Plus HS+B.L4U1.13 Plus HS+B.L4U1.14</p>
7	Human Impact and Biodiversity	<ul style="list-style-type: none"> • Human activity and biodiversity of ecosystems • Inherited traits in a population and biological diversity 	<p>Essential HS.L2U3.18 Essential HS.L4U1.27 Plus HS+B.L4U1.2</p>