

## GIPS Biology Design Map

Units (in sequence)	Estimated Time Frame (days)	K-12 Program Strands With Corresponding Course/Grade Level Standards	K-12 Program Enduring Understandings (for content only)	K-12 Program Essential Questions (for content only)	Unit Assessments (note if optional)	C/GL Key Vocabulary Concepts	
Unit 1 <b>Science &amp; Tools</b>	10-12 days	<p><b><u>Earth &amp; Space Science</u></b> <b>4.3 Origin &amp; Evolution</b></p>	<p>The capacity of available tools affects the quality and specificity of information that scientists can collect.</p> <p><b>See strand one for full text.</b></p>	<p>How do scientists work to figure out how the world began?</p>	Microscope Lab (R)	<p>cell reproduction metabolism homeostasis atomic structure macromolecules DNA ecology environment autotroph heterotroph biotic abiotic symbiosis biome biogeochemical cycles diffusion osmosis genetics mitosis meiosis evolution natural selection transcription translation taxonomy animal plant fungi protist bacteria angiosperm gymnosperm vertebrate invertebrate</p>	
Unit 2 <b>Chemistry</b>	15-17 days	<p><b><u>Physical Science</u></b> <b>2.1 Chemical &amp; Physical Properties of Matter</b></p> <p>Understand and analyze biochemical principals essential for life including water chemistry, photosynthesis, cellular respiration, structure and function of macromolecules and enzymes</p> <p>Describe and explain the basic structure of atoms, bonding and their reactions</p>	<p>All matter is made up of relatively few kinds of basic materials combined in various ways.</p> <p>The way matter can be separated determines what type of matter it is.</p> <p>When two or more substances interact to form new substances, the properties of the new combinations may be very different from those of the old.</p> <p><b>See strand one for full text.</b></p>	<p>How do scientists distinguish between objects? What do they learn from the comparisons?</p> <p>What causes a reaction? How do we predict reactions before they happen?</p>	P-Water Lab (opt)	<p>Structured Response Selected &amp; Constructed</p>	<p>biogeochemical cycles diffusion osmosis genetics mitosis meiosis evolution natural selection transcription translation taxonomy animal plant fungi protist bacteria angiosperm gymnosperm vertebrate invertebrate</p>
Unit 3 <b>Ecosystems &amp; Biomes</b>	10-12 days	<p><b><u>Life Science</u></b> <b>3.3 Ecosystems</b></p> <p>Describe how changes in abiotic and biotic factors affect the ability of the environment to support life</p> <p>Recognize and explain the patterns of behavior and interdependence of organisms in their natural environment</p> <p>Describe biological levels of organization including from atoms to Biosphere</p>	<p>Organisms can survive only in environments in which their needs can be met.</p> <p>The change one organism makes in order to adapt/survive has significant ripple effects.</p> <p><b>See strand one for full text.</b></p>	<p>How do organisms change, survive and adapt to their environments?</p> <p>How do living things interact with each other?</p>	P-Biome Brochure Labs	<p>Structured Response Selected &amp; Constructed</p>	<p>biogeochemical cycles diffusion osmosis genetics mitosis meiosis evolution natural selection transcription translation taxonomy animal plant fungi protist bacteria angiosperm gymnosperm vertebrate invertebrate</p>

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<b>Unit 5 Cells</b>	15-17 days	<p><b><u>Life Science</u></b> <b>3.1 Diversity of Life</b></p> <p>Understand and analyze biochemical principals essential for life including water chemistry, photosynthesis, cellular respiration, structure and function of macromolecules and enzymes</p> <p>Create models showing the structure and function of cells</p> <p>Explain and understand the function and structure of microorganisms, plants, and animals</p>	<p>All living things are made of similar chemicals, compounds, and elements.</p> <p>Living things have certain structures that serve necessary functions for growth, response to stimulus, reproduction and use of energy.</p> <p style="text-align: center;"><b>See strand one for full text.</b></p>	<p>What is the difference between living and non-living things?</p> <p>What does is mean to be alive?</p> <p>What are living things made of?</p>	<p>Performance Naked Egg Lab - diffusion &amp; osmosis (R)</p> <p>Structured Response Selected &amp; Constructed</p>	
<b>Unit 6 Genetics</b>	28-30 days	<p><b><u>Life Science</u></b> <b>3.4 Genetics</b></p> <p>Analyze the molecular basis of heredity</p>	<p>All living things go through predictable phases of life or maturity.</p> <p>While an organism's traits are inherited, the appearance of those traits can be modified.</p> <p style="text-align: center;"><b>See strand one for full text.</b></p>	<p>What are life cycles of living things?</p> <p>Where do living things get their traits?</p>	<p>P - Personal Trait</p> <p>Structured Response Selected &amp; Constructed</p>	
<b>Unit 7 Evolution</b>	10-12 days	<p><b><u>Life Science</u></b> <b>3.4 Genetics</b></p> <p>Understand and evaluate the theory of biological evolution and how natural selection leads to adaptations</p> <p><b><u>Earth &amp; Space Science</u></b> <b>4.3 Origin and Evolution</b></p> <p>Describe factors that might limit dynamic equilibrium of ecosystems including: disasters, climate change, new species, human activities, population changes, technological advances</p> <p>Identify different methods for determining fossil age</p>	<p>Environment has the power to shape/change how an organism responds/functions in it's surroundings.</p> <p>Evidence gathered from the past is used to explain origination of an event, phenomenon, species, system and help predict the future.</p> <p style="text-align: center;"><b>See strand one for full text.</b></p>	<p>Where do living things get their traits?</p> <p>How do scientists work to figure out how the world began?</p>	<p>Structured Response Selected &amp; Constructed</p>	

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Unit 8 Taxonomy	7-9 days	<p><u>Life Science</u> 3.2 Classification</p> <p>Explain and understand the function and structure of microorganisms, plants, and animals</p>	<p>The level of classification systems is an ongoing effort within the science community so that there are meaningful ways to study groups.</p> <p><b>See strand one for full text.</b></p>	<p>Why and how do scientists classify living things?</p>	<p>Structured Response Selected &amp; Constructed</p>	
Unit 9 Bacteria	7-9 days	<p><u>Life Science</u> 3.1 Diversity of Life</p> <p><u>Life Science</u> 3.2 Classification</p> <p><u>Life Science</u> 3.3 Ecosystems</p> <p>Explain and understand the function and structure of microorganisms, plants, and animals</p>	<p>Living things have certain structures that serve necessary functions for growth, response to stimulus, reproduction and use of energy.</p> <p>The level of classification systems is an ongoing effort within the science community so that there are meaningful ways to study groups.</p> <p>Organisms can survive only in environments in which their needs can be met.</p> <p>The change one organism makes in order to adapt/survive has significant ripple effects.</p> <p><b>See strand one for full text.</b></p>	<p>What are living things made of?</p> <p>Why and how do scientists classify living things?</p> <p>How do organisms change, survive and adapt to their environments?</p> <p>How do living things interact with each other?</p>	<p>P-wanted Poster (R)</p> <p>Structured Response Selected &amp; Constructed</p>	
Unit 10 Protists	6-8 days	<p><u>Life Science</u> 3.1 Diversity of life</p> <p><u>Life Science</u> 3.2 Classification</p> <p><u>Life Science</u> 3.3 Ecosystems</p> <p>Explain and understand the function and structure of microorganisms, plants, and animals</p>	<p>Living things have certain structures that serve necessary functions for growth, response to stimulus, reproduction and use of energy.</p> <p>The level of classification systems is an ongoing effort within the science community so that there are meaningful ways to study groups.</p> <p>Organisms can survive only in environments in which their needs can be met.</p> <p>The change one organism makes in order to adapt/survive has significant ripple effects.</p> <p><b>See strand one for full text.</b></p>	<p>What are living things made of?</p> <p>Why and how do scientists classify living things?</p> <p>How do organisms change, survive and adapt to their environments?</p> <p>How do living things interact with each other?</p>	<p>Structured Response Selected &amp; Constructed</p>	

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Unit 11 Fungi	6-8 days	<p><u>Life Science</u> 3.1 Diversity of Life</p> <p><u>Life Science</u> 3.2 Classification</p> <p><u>Life Science</u> 3.3 Ecosystems</p> <p>Explain and understand the function and structure of microorganisms, plants, and animals</p>	<p>Living things have certain structures that serve necessary functions for growth, response to stimulus, reproduction and use of energy.</p> <p>The level of classification systems is an ongoing effort within the science community so that there are meaningful ways to study groups.</p> <p>Organisms can survive only in environments in which their needs can be met.</p> <p>The change one organism makes in order to adapt/survive has significant ripple effects. <b>See strand one for full text.</b></p>	<p>What are living things made of?</p> <p>Why and how do scientists classify living things?</p> <p>How do organisms change, survive and adapt to their environments?</p> <p>How do living things interact with each other?</p>	Structured Response Selected & Constructed	
Unit 12 Plants	15-17 days	<p><u>Life Science</u> 3.1 Diversity of Life</p> <p><u>Life Science</u> 3.2 Classification</p> <p><u>Life Science</u> 3.3 Ecosystems</p> <p>Explain and understand the function and structure of microorganisms, plants, and animals</p>	<p>Living things have certain structures that serve necessary functions for growth, response to stimulus, reproduction and use of energy.</p> <p>The level of classification systems is an ongoing effort within the science community so that there are meaningful ways to study groups.</p> <p>Organisms can survive only in environments in which their needs can be met.</p> <p>The change one organism makes in order to adapt/survive has significant ripple effects. <b>See strand one for full text.</b></p>	<p>What are living things made of?</p> <p>Why and how do scientists classify living things?</p> <p>How do organisms change, survive and adapt to their environments?</p> <p>How do living things interact with each other?</p>	P-Changing Nutrient or Medium Plant Lab  Structured Response Selected & constructed	
Unit 13 Animals	15-17 days	<p><u>Life Science</u> 3.1 Diversity of Life</p> <p><u>Life Science</u> 3.2 Classification</p> <p><u>Life Science</u> 3.3 Ecosystems</p> <p>Explain and understand the function and structure of microorganisms, plants, and animals</p>	<p>Living things have certain structures that serve necessary functions for growth, response to stimulus, reproduction and use of energy.</p> <p>The level of classification systems is an ongoing effort within the science community so that there are meaningful ways to study groups.</p> <p>Organisms can survive only in environments in which their needs can be met.</p> <p>The change one organism makes in order to adapt/survive has significant ripple effects. <b>See strand one for full text.</b></p>	<p>What are living things made of?</p> <p>Why and how do scientists classify living things?</p> <p>How do organisms change, survive and adapt to their environments?</p> <p>How do living things interact with each other?</p>	Structured Response Selected & Constructed	