

## Unit 1

## Chemistry of Life

Duration	August - September 4.5 weeks		Assessed
Priority Standard(s)	Big Idea 1	Cite evidence and differentiate between the processes of evolution that drives the diversity & unity of life.	
	Big Idea 2	Compare and contrast how biological systems utilize free energy & molecular building blocks grow, reproduce & maintain dynamic homeostasis.	
	Big Idea 4	Investigate and assess biological systems interactions, and how these systems & their interactions possess complex properties.	
Supporting Standard(s)	1.d.1	Compare and Contrast the several hypothesis of natural origin of life on Earth, each citing supporting scientific evidence.	
	1.d.2	Compare and Contrast scientific evidences from many disciplines supporting models of the origin of life.	
	2.a.3	Cite evidences for how organisms must exchange matter with the environment to grow, reproduce and maintain organization.	
	4.a.1	Assess and hypothesize the subcomponents of biological molecules and their sequence determine the properties of that molecule.	
	4.a.2	Assess and analyze the structure and function of subcellular components and their interactions, that provide essential cellular processes.	
	4.b.1	Compare the interactions between molecules affect their structure and function	
	4.c.1	Differentiate between the variation in molecular units that provides a cells with a wider range of functions.	

**Unit 2**  
**The Cell**

Duration	September - October 4.5 weeks		Assessed
<b>Priority Standard(s)</b>	Big Idea 2	Biological systems utilize free energy & molecular building blocks to grow, to reproduce & to maintain dynamic homeostasis.	
	Big Idea 3	Living systems store, retrieve, transmit and respond to information essential to life processes.	
	Big Idea 4	Biological systems interact, and these systems and their interactions possess complex properties.	
<b>Supporting Standard(s)</b>	2.a.3	Organisms must exchange matter with the environment to grow, reproduce and maintain organization.	
	2.b.1	Cell membranes are selectively permeable due to their structure	
	2.b.2	Growth and dynamic homeostasis are maintained by the constant movement of molecules across membranes.	
	2.b.3	Eukaryotic cells maintain internal membranes that partition the cell into specialized regions.	
	2.e.2	Timing and coordination of physiological events are regulated by multiple mechanisms.	
	3.a.2	In eukaryotes, heritable information is passed to the next generation via processes that include the cell cycle and mitosis, or meiosis plus fertilization	
	3.b.2	A variety of intercellular and intracellular signal transmissions mediate gene expression.	
	3.d.1	Cell communication processes share common features that reflect a shared evolutionary history.	
	3.d.2	Cells communicate with each other through direct contact with other cells or from a distance via chemical signaling.	
	3.d.3	Signal transduction pathways link signal reception with cellular response.	
	3.d.4	Changes in signal transduction pathways can alter cellular response.	
4.a.2	The structure and function of subcellular components and their interactions, provide essential cellular processes		

**Unit 3**

**Cellular Energy**

<b>Duration</b>		<b>October - November 4.5 weeks</b>	<b>Assessed</b>
Priority Standard(s)	Big Idea 2	Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis.	
	Big Idea 4	Biological systems interact, and these systems and their interactions possess complex properties.	
Supporting Standard(s)	2.a.1	All living systems require constant input of free energy.	
	2.a.2	Organisms capture and store free energy for use in biological processes.	
	4.b.1	Interactions between molecules affect their structure and function.	

**Unit 4**

**Organism Form and Function**

Duration		November - December 4.5 weeks	Assessed
<b>Priority Standard(s)</b>	Big Idea 2	Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis.	
	Big Idea 3	Living systems store, retrieve, transmit and respond to information essential to life processes.	
	Big Idea 4	Biological systems interact, and these systems and their interactions possess complex properties.	
<b>Supporting Standard(s)</b>	2.c.1	Organisms use feedback mechanisms to maintain their internal environments and respond to external environmental changes.	
	2.d.3	Biological systems are affected by disruptions to their dynamic homeostasis.	
	2.d.4	Plants and animals have a variety of chemical defenses against infections that affect dynamic homeostasis.	
	3.d.2	Cells communicate with each other through direct contact with other cells or from a distance via chemical signaling.	
	3.e.2	Animals have nervous systems that detect external and internal signals, transmit and integrate information and produce responses.	
	4.a.4	Organisms exhibit complex properties due to interactions between their constituent parts.	
	4.c.1	Variation in molecular units provides cells with a wider range of functions.	

**Unit 5**

**Genetics Basics of Life**

<b>Duration</b>	<b>January 4.5 weeks</b>		<b>Assessed</b>
<b>Priority Standard(s)</b>	Big Idea 3	Living systems store, retrieve, transmit and respond to information essential to life processes.	
<b>Supporting Standard(s)</b>	3.a.1	DNA and in some cases RNA, is the primary source of heritable information.	
	3.a.2	In eukaryotes, heritable information is passed to the next generation via processes that include the cell cycle and mitosis, or meiosis plus fertilization.	
	3.a.3	The chromosomal basis of inheritance provides an understanding of the pattern of passage (transmission) of genes from parent to offspring.	
	3.a.4	The inheritance pattern of many traits cannot be explained by simple Mendelian genetics.	
	3.b.1	Gene regulation results in differential gene expression leading to cell specialization.	
	3.c.1	Changes in genotype can result in changes in phenotype.	

**Unit 6**

**Gene Activity and Biotechnology**

<b>Duration</b>	<b>January - February 4.5 weeks</b>		<b>Assessed</b>
<b>Priority Standard(s)</b>	Big Idea 3	Living systems store, retrieve, transmit and respond to information essential to life processes.	
<b>Supporting Standard(s)</b>	3.b.1	Gene regulation results in differential gene expression leading to cell specialization.	
	3.b.2	A variety of intercellular and intracellular signal transmissions mediate gene expression.	
	3.c.1	Changes in genotype can result in changes in phenotype.	
	3.c.3	Viral replication results in genetic variation, and viral infection can introduce genetic variation into the hosts.	

**Unit 7**  
**Ecology**

Duration	March 4.5 weeks		Assessed
<b>Priority Standard(s)</b>	Big Idea 1	The process of evolution drives the diversity and unity of Li	
	Big Idea 2	Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis.	
	Big Idea 3	Biological systems interact, and these systems and their interactions possess complex properties.	
<b>Supporting Standard(s)</b>	1.a.1	natural selection is a major mechanism of evolution.	
	2.a.1	All living systems require constant input of free energy.	
	2.d.1	All biological systems from cells and organisms to populations, communities, and ecosystems are affected by complex biotic and abiotic interactions including exchange of matter and free energy.	
	2.d.3	Biological systems are affected by disruptions to their dynamic homeostasis.	
	2.e.3	Timing and coordination of behavior are regulated by various mechanisms and are important in natural selection.	
	4.q.5	Communities are composed of populations of organisms that interact in complex ways.	
	4.a.6	Interactions among living systems and with their environment result in the movement of matter and energy.	
	4.b.3	Interactions between and within populations influence patterns of species distribution and abundance.	
	4.b.4	Distribution of local and global ecosystems changes over time.	
4.c.4	the diversity of species within an ecosystem may influence the stability of the ecosystem.		

**Unit 8**

**Evolution and Phylogeny**

Duration	April 4.5 weeks		Assessed
<b>Priority Standard(s)</b>	Big Idea 1	The process of evolution drives the diversity and unity of Life	
<b>Supporting Standard(s)</b>	1.a.1	natural selection is a major mechanism of evolution.	
	1.a.2	Natural selection acts on phenotypic variations in populations.	
	1.a.3	Evolutionary change is also driven by random processes.	
	1.a.4	Biological evolution is supported by scientific evidence from many disciplines including mathematics.	
	1.b.1	Organisms share many conserved core processes and features that evolved and are widely distributed among organisms today.	
	1.b.2	Phylogenetic trees and cladograms are graphical representations (models) of evolutionary history that can be tested.	
	1.c.1	Speciation and extinction have occurred throughout the Earth's history.	
	1.c.2	Speciation may occur when two populations become reproductively isolated from each other.	
	1.c.3	Populations of organisms continue to evolve.	
	1.d.1	There are several hypothesis about the natural origin of life on Earth, each with supporting scientific evidence.	
	1.d.2	Scientific evidences from many disciplines supports models of the origin of life.	