Curriculum Map: Biology

Course: BIOLOGY Sub-topic: Biology

Grade(s): 10

Course

Description:

tion: Biology is designed to teach students the unifying principles that consume the study of life. The subject matter focuses on common life processes. The course traces biological organization from the cellular level to the entire organism. The course gives students a solid understanding of the common themes associated with the many fields within the biological sciences. Students will use a variety of resources including laboratory investigations, computer applications, and research projects to enhance their understanding biology. All nine benchmark topics will be covered and reviewed in preparation for the Biology Keystone, which will occur at the end of the semester.

Course Requirement: Credit earned in Earth & Environment or Honors Earth & Environment

Unit: Unit 1- Biological Principles Characteristics of Life

STANDARDS: STANDARDS

STATE: Pennsylvania SAS Keystone Anchors (2010-2014)		
BIO.A.1 (Advanced)	Basic Biological Principles	
BIO.A.1.1 (Advanced)	Explain the characteristics common to all organisms.	
BIO.A.1.2 (Advanced)	Describe relationships between structure and function at biological levels of organization.	

Topic: What is Life?

Minutes for Topic: 86

Topic: Scientific Method Review

Minutes for Topic: 86

Topic: Scientific Method and Tools of Science

Minutes for Topic: 129

Topic: Review for Quest

Minutes for Topic: 86

Topic: Quest on Characteristics of Life and Scientific Method

Minutes for Topic: 86

Unit: Unit 2-pH and Living

STANDARDS: STANDARDS

STATE: Pennsylvania SAS Keystone Anchors (2010-2014)		
BIO.A.2 (Advanced)	The Chemical Basis for Life	
BIO.A.2.1	Describe how the unique properties of water support life on	
(Advanced)	Earth.	
BIO.A.2.1.1	Describe the unique properties of water and how these	
(Advanced)	properties support life on Earth (e.g., freezing point, high	
	specific heat, cohesion).	

Topic: Properties of Water Minutes for Topic: 86

Topic: Acids and Bases Minutes for Topic: 172

Topic: Quest Review Minutes for Topic: 86

Topic: Quest-pH and Living Minutes for Topic: 86

Unit: Unit 3-Biochemistry

STANDARDS: STANDARDS

STATE: Pennsylvania SAS Keystone Anchors (2010-2014)			
	BIO.A.2 (Advanced)	The Chemical Basis for Life	
	BIO.A.2.2.1	Explain how carbon is uniquely suited to form biological	
	(Advanced)	macromolecules.	
	BIO.A.2.2.2	Describe how biological macromolecules form from monomers.	
	(Advanced)	Describe now biological macromolecules form from monomers.	
	BIO.A.2.2.3	Compare the structure and function of carbohydrates, lipids,	
	(Advanced)	proteins, and nucleic acids in organisms.	
	BIO.A.2.3	Explain how enzymes regulate biochemical reactions within a	
	(Advanced)	cell.	
	BIO.A.2.3.1	Describe the role of an enzyme as a catalyst in regulating a	
	(Advanced)	specific biochemical reaction.	
	BIO.A.2.3.2	Explain how factors such as pH, temperature, and	
	(Advanced)	concentration levels can affect enzyme function.	

Topic: Carbohydrates

Minutes for Topic: 172

Topic: Lipids

Minutes for Topic: 86

Topic: Proteins and Enzymes

Minutes for Topic: 86

Topic: Nucleic Acids

Minutes for Topic: 86

Topic: Enzymes Minutes for Topic: 172

Topic: Quest Review-Biochem

Topic: Quest

Unit: Unit 4-Cells Timeline: 1 Weeks				
STANDARDS:	STANDARDS			
	STATE: Pennsylvani	a SAS Keystone Anchors (2010-2014)		
	BIO.A.1.2.2	Describe and interpret relationships between structure and		
	(Advanced)	function at various levels of biological organization (i.e., organelles, cells, tissues, organs, organ systems, and multicellular organisms).		
	BIO.A.3.1.1 (Advanced)	Describe the fundamental roles of plastids (e.g., chloroplasts) and mitochondria in energy transformations.		

Topic: Cell Structure and Function

Topic: Cell Organelles

Minutes for Topic: 86

Topic: Cell Microscopy Minutes for Topic: 86

Topic: Cell Organelle Practice Minutes for Topic: 86

minutes for Topic. o

Topic: Cell Quest Review

Topic: Quest-Cells

Unit: Unit 5-Cell Transport

STANDARDS: STANDARDS

STATE: Pennsylvania SAS Keystone Anchors (2010-2014)BIO.A.4 (Advanced)Homeostasis and Transport BIO.A.4.1Identify and describe the cell structures involved in transport (Advanced)of materials into, out of, and throughout a cell.BIO.A.4.1.1BIO.A.4.1.1Describe how the structure of the plasma membrane allows it

(Advanced)

Topic: Cell Transport-Passive Transport

Minutes for Topic: 86

Topic: Cell-Transport Lab Investigation Minutes for Topic: 172

Topic: Cell Transport-Active Transport

Minutes for Topic: 86

Topic: Quest Review

Minutes for Topic: 86

Topic: Quest on Cell Transport

Unit: Unit 6-Bioenergetics

STANDARDS: STANDARDS 5

STATE: Pennsylvania	a SAS Keystone Anchors (2010-2014)	
BIO.A.3 (Advanced)	Bioenergetics	
BIO.A.3.1	Identify and describe the cell structures involved in processing	
(Advanced)	energy.	
BIO.A.3.1.1	Describe the fundamental roles of plastids (e.g., chloroplasts)	
(Advanced)	and mitochondria in energy transformations.	
BIO.A.3.2	Identify and describe how organisms obtain and transform	
(Advanced)	energy for their life processes.	
BIO.A.3.2.1	Compare the basic transformation of energy during	
(Advanced)	photosynthesis and cellular respiration.	

Topic: Photosynthesis

Minutes for Topic: 172

Topic: Respiration

Minutes for Topic: 86

Topic: Photosynthesis and Cellular Respiration Script and Review Minutes for Topic: 172

Topic: Quest Review-Photosynthesis

Minutes for Topic: 86

Topic: Quest-Photosynthesis and Cellular Respiration

Minutes for Topic: 86

Unit: Unit 7-Mitosis Meiosis

STANDARDS: STANDARDS

STATE: Pennsylvania SAS Keystone Anchors (2010-2014)		
BIO.B.1 (Advanced)	Cell Growth and Reproduction	
BIO.B.1.1	Describe the three stages of the cell cycle: interphase, nuclear	
(Advanced)	division, cytokinesis.	
BIO.B.1.1.1	Describe the events that occur during the cell cycle:	
(Advanced)	interphase, nuclear division (i.e., mitosis or meiosis),	
	cytokinesis.	
BIO.B.1.1.2	Compare the processes and outcomes of mitotic and meiotic	
(Advanced)	nuclear divisions.	

Topic: Mitosis

Minutes for Topic: 258

Topic: Meiosis Minutes for Topic: 258

Topic: Mitosis Meiosis Review

Minutes for Topic: 86

Unit: Unit 8-DNA Replication and Protein Synthesis

STANDARDS: STANDARDS

STATE: Pennsylvania SAS Keystone Anchors (2010-2014)			
BIO.B.1.2 (Advanced)	Explain how genetic information is inherited.		
BIO.B.1.2.1 (Advanced)	Describe how the process of DNA replication results in the transmission and/or conservation of genetic information.		
BIO.B.1.2.2 (Advanced)	Explain the functional relationships between DNA, genes, alleles, and chromosomes and their roles in inheritance.		

This Curriculum Map Unit has no Topics to display

Unit: Unit 9- Mendelian Genetics STANDARDS: STANDARDS

:	STANDARDS		
	STATE: Pennsylvania	a SAS Keystone Anchors (2010-2014)	
	BIO.B.1.2 (Advanced)	Explain how genetic information is inherited.	
	BIO.B.2 (Advanced)	Genetics	
	BIO.B.2.1 (Advanced)	Compare Mendelian and non-Mendelian patterns of \inheritance.	
	BIO.B.2.1.1 (Advanced)	Describe and/or predict observed patterns of inheritance (i.e., dominant, recessive, co-dominance, incomplete dominance, sex-linked, polygenic, and multiple alleles).	
	BIO.B.2.3 (Advanced)	Explain how genetic information is expressed.	

Topic: Monohybrid Crosses

Minutes for Topic: 172

Topic: Practice Crosses

Minutes for Topic: 172

Unit: Unit 10-Applied Genetics

STANDARDS: STANDARDS

STATE: Pennsylvania SAS Keystone Anchors (2010-2014)		
BIO.B.1.2 (Advanced)	Explain how genetic information is inherited.	
BIO.B.2.1	Compare Mendelian and non-Mendelian patterns of	
(Advanced)	\inheritance.	
BIO.B.2.1.1	Describe and/or predict observed patterns of inheritance (i.e.,	
(Advanced)	dominant, recessive, co-dominance, incomplete dominance, sex-linked, polygenic, and multiple alleles).	
BIO.B.3.1.3 (Advanced)	Explain how genetic mutations may result in genotypic and phenotypic variations within a population.	

Topic: Mendel Exceptions

Minutes for Topic: 258

Topic: Genetics Review Minutes for Topic: 86

Topic: Genetics Quest Minutes for Topic: 86

Unit: Unit 11-Biotechnology

Topic: genetic engineering Minutes for Topic: 172

Unit: Unit 12-Keystone review \rightarrow Cell Energy, Parts of a Cell, Ecology

Topic: Keystone Review-Ecology

Minutes for Topic: 172

Unit: Unit 13-Keystone review \rightarrow Evolution

Topic: Evolution Review

Minutes for Topic: 172

Unit:

This Curriculum Map Unit has no Topics to display