

DESOTO COUNTY HIGH SCHOOL
CURRICULUM CALENDAR 2011 - 2012
HONORS BIOLOGY
20003200

Textbook:

Under the category (Florida: New Generation Sunshine State Standards) **Benchmarks**, *High*, *Moderate*, or *Low* refers to complexity ranking.

* indicates that this standard will be on the Biology End-of-Course Assessment

UNIT/ORGANIZING PRINCIPLE: The nature of science & science inquiry Chapter 1		Pacing: <i>First 9 Weeks, Days 1-5)</i>		
Essential Question(s): 1. What makes scientific inquiry a multi-faceted activity? 2. What is meant when we say that the processes of science frequently do not correspond to the traditional portrayal of “the scientific method?”		Big Idea : The scientific method of science inquiry.		
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
<p>The Practice of Science. The Nature of Science goes far beyond the teaching of the Scientific Method.</p> <p>These benchmarks are very important for students to understand because they <i>explain how the scientific world really operates</i></p>	<p>Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:</p> <ol style="list-style-type: none"> pose questions about the natural world, conduct systematic observations, examine books and other sources of information to see what is already known, review what is known in light of empirical evidence, plan investigations, use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs), pose answers, explanations, or descriptions of events, 	<p>*SC.912.N.1.1 <i>High</i> (also assesses N.1.4, N. 1.6, LA.910.2.2.3, LA.910.4.2.2, MA.912.S.1.2, and MA.912.S.3.2)</p>	<ol style="list-style-type: none"> Science is an organized way of learning about the natural world. Scientific methodology involves <ol style="list-style-type: none"> observing and asking questions Inferring and forming a hypothesis Designing controlled experiments with controlling the variables and comparing to the control group. Collecting and Analyzing Data Drawing Conclusions. Scientific Theories Science, Ethics and Morality Studying Live and the Characteristics of Living <i>Things</i> <ol style="list-style-type: none"> <i>Cells,</i> <i>Organization</i> <i>Development</i> <i>Growth</i> 	<p>Data Hypothesis Control Dependent variable Independent variable Experiment Predict Analyze</p>

	<ol style="list-style-type: none"> 8. generate explanations that explicate or describe natural phenomena (inferences), use appropriate evidence and reasoning to justify these explanations to others, 9. communicate results of scientific investigations, and 10. evaluate the merits of the explanations produced by others 		<p><i>e. Energy</i> <i>f. Responsiveness</i> <i>g. Reproduction</i></p> <p>Labs – which include data collection and analysis, may include:</p> <p>Lab on metabolism – <i>Is Yeast Alive?</i> which studies respiration from breaking down sugar; and <i>The Yeast Beast</i> which studies decomposition by a living organism.</p> <p>Activities might include:</p> <p>Learning the vocabulary words using flash card. Next in groups checking out the index to find out where their vocabulary words are used in the other chapters and reporting back to the class.</p> <p>Break into groups, locate Appendix B and each group will write 5 game show type questions on safety rules and symbols that are used in science books and class.</p>	
--	---	--	--	--

UNIT/ORGANIZING PRINCIPLE: Characteristics of Living organism			Pacing: First Nine Weeks Week 2 10 days	
Essential Question(s) 1. What are the characteristics of living organisms? 2. What are the unifying themes in biology?			Big Idea : The molecular basis of life.	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
Living vs non-living	Describe the scientific theory of cells (cell theory) and relate the history of its discovery to the process of science.	*SC.912.L.14.1 <i>Moderate</i> (also assesses N.1.3, N.2.1 & N.3.4)	<p>1. The 7 characteristics that classify a living organism.</p> <p>2. Missing one it is NON living.</p> <p>Labs might include:</p> <p>Lab on metabolism – <i>Is Yeast Alive?</i> which studies respiration from braking down sugar; and <i>The Yeast Beast</i> which studies decomposition by a living organism.</p> <p>Lab – Adaptations – how organisms show the themes/characteristics in biology</p> <p>Lab on the scientific method – <i>Interpreting a controlled</i></p>	<p>Biology</p> <p>Cell</p> <p>Tissue</p> <p>Organ</p> <p>Reproduction</p> <p>Metabolism</p> <p>Homeostasis</p> <p>Species</p> <p>Adaptation</p>

UNIT/ORGANIZING PRINCIPLE: The molecular basis of life Chapter 2 – Chemistry of life and Chapter 3 – Carbon Compounds			Pacing: First Nine Weeks Weeks 3 – 4 10 days	
Essential Question(s): 1. What are the four basic categories of macromolecules that compose all living things? 2. What are the basic rules of chemistry that the chemical reactions in living things follow? 3. What are the unique properties of water that make life on Earth possible? 4. What role do enzymes play in chemical reactions?			Big Idea : The molecular basis of life.	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
How chemical reactions take place.	Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules.	*SC.912.L.18.1 <i>Moderate</i> (also accesses L.18.2, 18.3, 18.4, and 18.11)	The molecular basis of life with matter and energy and the basic chemical principles that affect living things. The students will learn about the basic chemical principles that affect living things. They will understand how the properties of water are important to organisms.	Atom Element Compound Molecule Covalent bond
The four basic categories of macromolecules that compose all living things.	Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.	SC.912.P.8.4 <i>Moderate</i> (not assessed)	The students will learn how organisms use different types of carbon compounds and how chemicals combine and break apart inside living things.	Ionic bond Ion Oxidation reaction Reduction reaction Redox reaction
The unique properties of water that make life on Earth possible	Discuss the special properties of water that contribute to Earth's suitability as an environment for life: cohesive behavior, ability to moderate temperature, expansion upon freezing, and versatility as a solvent. Describe the important structural characteristics of monosaccharides,	*SC.912.L.18.12 <i>Moderate</i> SC.912.L.18.2	Labs might include: Lab – <i>pH</i> which tests the pH of common substances.	Cohesion Adhesion

	<p>disaccharides, and polysaccharides and explain the functions of carbohydrates in living things.</p> <p>Describe the structures of fatty acids, triglycerides, phospholipids, and steroids. Explain the functions of lipids in living organisms. Identify some reactions that fatty acids undergo. Relate the structure and function of cell membranes.</p> <p>Describe the structures of proteins and amino acids. Explain the functions of proteins in living organisms. Identify some reactions that amino acids undergo. Relate the structure and function of enzymes.</p> <p>Connect the role of adenosine triphosphate (ATP) to energy transfers within a cell.</p> <p>Explain the role of enzymes as catalysts that lower the activation energy of biochemical reactions. Identify factors, such as pH and temperature, and their effect on enzyme activity.</p>	<p><i>Moderate</i> (assessed as 18.1)</p> <p>SC.912.L.18.3 <i>Moderate</i> (assessed as 18.1)</p> <p>SC.912.L.18.4 <i>Moderate</i> (assessed as 18.1)</p> <p>SC.912.L.18.10 <i>High</i> (assessed as 18.9)</p> <p>SC.912.L.18.11 <i>Moderate</i> (assessed as 18.1)</p>	<p>Lab – <i>Frightened Run-away Pepper</i> on adhesion</p> <p>Lab – <i>How Does Liquid Soap Affect the Surface Tension of Water?</i> on cohesion, adhesion & surface tension</p> <p>Lab – <i>Testing for the Presence of Organic Nutrients</i> testing for carbohydrates (sugars and starches), proteins and lipids (fats & oils)</p> <p>Lab – <i>Strange Acting Goop</i> on cohesion and macromolecules</p> <p>Labs - <i>Can Steel Wool Generate Energy?</i> and <i>The Changing Thermometer</i> on energy absorbing (endothermic) and energy releasing (exothermic) chemical reactions.</p> <p>Lab – Using molecular model kit, students put together organic molecules</p> <p>Possible Demonstrations:</p> <p><i>The Mysterious Gelatin</i> – on enzyme action</p> <p><i>The Overflowing Soda Bottle</i> – on chemical reactions</p>	<p>Solution</p> <p>Acid</p> <p>Base</p> <p>pH scale</p> <p>organic compound</p> <p>Carbohydrate</p> <p>Lipid</p> <p>Protein</p> <p>Amino acid</p> <p>Nucleic acid</p> <p>Nucleotide</p> <p>DNA</p> <p>RNA</p> <p>ATP</p> <p>Energy</p> <p>Activation energy</p> <p>Enzyme</p> <p>Catalyst</p>
--	---	---	--	---

UNIT/ORGANIZING PRINCIPLE: Cell parts & their functions			Pacing: First Nine Weeks Weeks 5 – 6 1/2	
Essential Question(s): 1. What is the history of the microscope, & what types are presently being used? 2. What are the differences between prokaryote & eukaryote cells? 3. What are the parts and function of cells?			Big Idea : Cell structure & their functions	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
Cell structure and physiology	<p>Compare and contrast structure and function of various types of microscopes.</p> <p>Describe the scientific theory of cells (cell theory) and relate the history of its discovery to the process of science.</p> <p>Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport).</p> <p>Compare and contrast the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells. Explain the evidence supporting the scientific theory of the origin of eukaryotic cells. (endosymbiosis.)</p>	<p><u>SC.912.L.14.4</u> <i>Moderate</i> (not assessed)</p> <p>*<u>SC.912.L.14.1</u> <i>Moderate</i> (also assesses N.1.3, N.2.1, N.3.1, & N.3.4)</p> <p><u>SC.912.L.14.2</u> <i>Moderate</i> (assessed as 14.3)</p> <p>*<u>SC.912.L.14.3</u> <i>Moderate</i> (also assesses 14.2)</p> <p>SC.912.L.14.5 <i>High</i></p>	<p>Students will build toward the understanding that a cell is the basic unit of life; the processes that occur at the cellular level provide the energy and basic structure organisms need to survive.</p> <p>The students will learn about the cell theory, the cell structure and function of the parts in the prokaryotic and eukaryotic cells.</p> <p>The students will learn about how a cell structures enables a cell to carry out basic life processes and how a cell transports materials across the cell membrane. The students will learn how a cell maintains homeostasis both within itself and as part of a multicellular.</p> <p>Labs might include: <i>Lab – Microscope Practice</i> – using</p>	<p>Light microscope Electron Microscope Magnification Resolution Cell theory Cell membrane Cytoplasm Cytoskeleton Ribosomes Prokaryote Eukaryote Cell wall Flagellum Cilium Centrioles Nucleus Organelle Photosynthesis Chloroplast Endoplasmic Reticulum Vesicle</p>

		(not assessed)	<p>microscopes & stereoscopes <i>Lab – Cell Structure</i> – making slides & looking at tissues like onion epidermis, elodea cells, cheek cells, unicellular organisms, etc.</p> <p>Activity might include: Students make a poster comparing typical prokaryote and eukaryote cells.</p>	<p>Golgi apparatus Lysosome Mitochondria Cellular respiration Vacuole Chromoplasts Endosymbiosis Passive transport Concentration gradient Equilibrium Diffusion Osmosis Hypertonic, hypotonic & isotonic solution Contractile vacuole Turgor pressure Ion channel carrier protein facilitated diffusion active transport sodium-potassium pump endocytosis exocytosis receptor protein</p>
--	--	----------------	--	--

UNIT/ORGANIZING PRINCIPLE: Homeostasis and Cell Transport			Pacing: First Nine Weeks Weeks 6 ½ - 8	
Essential Question(s): 1. How do substances pass into and out of cells? 2. What are the physical and chemical properties of cell membranes?			Big Idea : Homeostasis and Cell Transport	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
Molecular level of organization	Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport).	<u>SC.912.L.14.2</u> <i>Moderate</i> (assessed as 14.3)	A cell is the basic unit of life; the processes that occur at the cellular level provide the energy and basic structure organisms need to survive The student should be able to understand how a cell transports materials across the cell membrane. Labs might include: Lab – <i>Diffusion and Osmosis</i> Lab – <i>Hypertonic, Isotonic, and Hypotonic Solutions</i> – using dog blood Possible Demonstration: <i>Smelly balloons</i>	Passive transport Concentration gradient equilibrium diffusion osmosis hypertonic, hypotonic & isotonic solution contractile vacuole turgor pressure ion channel carrier protein facilitated diffusion active transport sodium-potassium pump endocytosis exocytosis receptor protein

UNIT/ORGANIZING PRINCIPLE: : Photosynthesis and Cellular Respiration Chapter 6 and Chapter 7			Pacing: 2nd Nine Weeks Weeks 1 - 2	
Essential Question(s): 1. What is the role of chlorophylls & other pigments in photosynthesis? 2. What are the main events in the light reactions of photosynthesis? 3. What are the main events in the Calvin cycle? 4. What are the main events in anaerobic respiration? 5. What are the main events in aerobic respiration? 6. What environmental factors affect photosynthesis & respiration?				Big Idea : The biochemical processes of photosynthesis and respiration
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
Photosynthesis And Cellular Respiration	<p>Discuss the role of anaerobic respiration in living things and in human society.</p> <p>Identify the reactants, products, and basic functions of photosynthesis.</p> <p>Identify the reactants, products, and basic functions of aerobic and anaerobic cellular respiration.</p> <p>Explain the interrelated nature of photosynthesis and cellular respiration.</p>	<p>SC.912.18.6 <i>Moderate</i> (not assessed)</p> <p>SC.912.L.18.7 <i>Moderate</i> (assessed as 18.9)</p> <p>SC.912.L.18.8 <i>Moderate</i> (assessed as 18.9)</p> <p>*SC.912.L18. <i>(Moderate)</i> (also assessed as 18.7, 18.8 & 18.10)</p>	<p>Students will learn about the process of photosynthesis and further explore how a cell is the basic unit of life. the processes that occur at the cellular level provide the energy and basic structure organisms need to survive. The ability of photosynthetic cells to harness the sun's energy give them a special function in the biosphere.</p> <p>The students will learn about the organisms and cellular structures involved in photosynthesis as well as the two stages of chemical reactions that make up the process. They will explore analogies that help them understand the function of ATP and electron carriers.</p> <p>Labs might include: Lab – <i>What do plants do with the starch they make?</i> (photosynthesis)</p>	<p>Autotroph</p> <p>Photosynthesis</p> <p>Heterotroph</p> <p>Light reactions</p> <p>Thylakoid</p> <p>Granum</p> <p>Stroma</p> <p>Electron transport chain</p> <p>Calvin cycle</p> <p>Cellular respiration</p> <p>Anaerobic</p> <p>Aerobic</p> <p>Glycolysis</p> <p>Fermentation</p> <p>Krebs cycle</p>

	Connect the role of adenosine triphosphate (ATP) to energy transfers within a cell.	SC.912.L.18.10 <i>High</i> <i>Assessed as</i> <i>18.9</i>	Lab – <i>Paper chromatography of chlorophyll</i> (photosynthesis) Lab on cellular respiration – <i>Do Dormant Seeds Respire?</i>	
--	---	--	---	--

UNIT/ORGANIZING PRINCIPLE: DNA, RNA, and Protein Synthesis; the Genetic Code & Gene Technology			Pacing: 2nd Nine Weeks Week 3 & 4	
Essential Question(s): 1. What experiments lead to the discovery of DNA? 2. How is genetic information passed from one generation to the next and how does this account for similarities in related individuals? 3. How has gene biotechnology impacted individuals, society, and the environment?			Big Idea : DNA, RNA & the genetic code; the latest uses of biotechnology.	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
DNA: The Genetic Material How Proteins are Made Brief overview of biotechnology: cloning, human genome, DNA fingerprinting	Describe how mutation and genetic recombination increase genetic variation. Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic information Explain the basic processes of transcription and translation, and how they result in the expression of genes. Explain how and why the genetic code is universal and is common to almost all organisms. Evaluate the impact of biotechnology on the	SC.912.L.15.15 (assessed as 15.6) *SC.912.L.16.3 <i>High</i> (also assesses 16.4, 16.5, and 16.9) SC.912.L.16.5 <i>High</i> (assessed as 16.3) SC.912.L.16.9 <i>Moderate</i> (assessed as 16.3)	Labs might include: <i>Extracting Your DNA.</i> <i>Making a model of DNA</i> - out of pony beads and chenille Activity might include assigning students a report to research on genetic engineering, human genetic disorders, etc Using models to simulate DNA replication, transcription and protein synthesis..	Gametes Binary fission Gene Chromosome Chromatid Homologous chromosomes diploid haploid polyploid zygote fertilization

	<p>individual, society and the environment, including medical and ethical issues.</p> <p>Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspective of both individual and public health</p>	<p>*SC.912.L.16.10</p> <p><i>High</i></p> <p><u>SC.912.L.14.6</u></p> <p>(not assessed)</p>		<p>autosome</p> <p>sex chromosome</p> <p>karyotype</p> <p>mitosis</p> <p>cancer</p> <p>meiosis</p> <p>crossing-over</p> <p>independent</p> <p>assortment</p> <p>sperm</p> <p>ova</p> <p>spore</p>
--	--	---	--	---

UNIT/ORGANIZING PRINCIPLE: Mitosis & Meiosis			Pacing: 2nd Nine Weeks Week 5	
Essential Question(s): 1. What are the processes involved with the different types of reproduction? 2. Why is cellular reproduction vital to living organisms?			Big Idea : The two types of cell division.	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
<p>Mitosis & cell reproduction</p> <p>Explain the relationship between cell cycle, mutation, and uncontrolled cell growth potentially resulting in cancer.</p> <p>How meiosis contributes to sexual reproduction and genetic</p>	<p>Describe the cell cycle, including the process of mitosis. Explain the role of mitosis in the formation of new cells and its importance in maintaining chromosome number during asexual reproduction.</p> <p>Compare and contrast binary fission and mitotic cell division.</p> <p>Describe the process of meiosis, including independent assortment and crossing over. Explain how reduction division results in the formation of haploid gametes or spores.</p> <p>Explain the relationship between mutation, cell cycle, and uncontrolled cell growth potentially resulting in cancer.</p> <p>Compare and contrast mitosis and meiosis and relate to the processes of sexual and</p>	<p>SC.912.L.16.14 <i>Moderate</i> (assessed as 16.17)</p> <p>SC.912.L.16.15 <i>Moderate</i> (not assessed)</p> <p>SC.912.L.16.16 <i>Moderate</i> (assessed as 16.17)</p> <p>SC.912.L.16.8 (assessed as 16.17)</p> <p>*SC.912.L.16.17 <i>High</i> (assessed as 16.8,</p>	<p>The processes that occur at the cellular level provide the energy and basic structure organisms need to survive. They will explore cell size, cell division, and the process of differentiation.</p> <p>The students will study the cell's growth and development leading to why a cell needs to divide. They will learn how the cells divide and what controls the process of the cell division both in somatic and gamete cells.</p> <p>Labs might include:</p>	<p>Gene</p> <p>Chromosome</p> <p>Chromatid</p> <p>Homologous chromosomes</p> <p>diploid</p> <p>haploid</p> <p>Gametes</p> <p>polyploid</p> <p>Binary fission</p> <p>zygote</p> <p>fertilization</p>

<p>diversity.</p>	<p>asexual reproduction and their consequences for genetic variation.</p>	<p>16.14, & 16.16)</p>	<p>Flip Book Foldable: Mitosis</p> <p>Microscopes and prepared slides for students to observe set up in the back of the room to compare mitosis and meiosis.</p>	<p>autosome</p> <p>sex chromosome</p> <p>karyotype</p> <p>mitosis</p> <p>cytokinesis</p> <p>cancer</p> <p>meiosis</p> <p>crossing-over</p> <p>independent</p> <p>assortment</p> <p>sperm</p> <p>Spermatogenesis</p> <p>Ova</p> <p>Oogenesis</p> <p>spore</p>
-------------------	---	----------------------------	--	--

UNIT/ORGANIZING PRINCIPLE: Genetics			Pacing: 2nd Nine Weeks Weeks 6 - 8	
Essential Question(s): 1. How is genetic information passed from one generation to the next and how does this account for similarities in related individuals? 2. How can Punnett squares and pedigrees be used to predict the probability of genetic outcomes?			Big Idea : The Inheritance of characteristics	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
Mendel's laws of inheritance Determining genetic outcomes	Use Mendel's laws of segregation and independent assortment to analyze patterns of inheritance. Discuss observed inheritance patterns caused by various modes of inheritance, including dominant, recessive, codominant, sex-linked, polygenic, and multiple alleles Explain how mutations in the DNA sequence may or may not result in phenotypic change. Explain how mutations in gametes may result in phenotypic changes in offspring. Describe how mutations and genetic recombination increase genetic	*SC.912.L.16.1 <i>High</i> (also assesses 16.2) SC.912.L16.2 <i>High</i> (assessed as 16.1) SC.912.L.16.4 <i>High</i> (assessed as 16.3) SC.912.L.15.15 <i>Moderate</i> (assessed as	Students will discover how cellular information passes from one generation to another. DNA is the universal code for life; it enables an organism to transmit hereditary information and, along with the environment, determines an organism's characteristics. The students will be able to predict the outcome of a genetic cross with the use of a Punnett Square. They will learn how to make a pedigree to show the traits passed down from generation to generation. Labs might include: Lab – <i>Probability – on Coin Tossing</i> Lab – <i>Human Inherited Traits</i>	Heredity Genetics P, F ₁ , & F ₂ Generation Allele Dominant Recessive Homozygous Heterozygous Genotype Phenotype Law of Segregation Law of independent assortment Punnett Square Probability Pedigree Sex-linked trait Polygenic inheritance Incomplete dominance Multiple alleles Codominance Amniocentesis

	variation.	15.13	Activities might include: Problem worksheets – working genetics problems <i>Dragon Genetics</i> problems Students make a Data Table surveying their family on certain traits, and then making a Pedigree from 1 of those surveyed traits.	Genetic counseling
--	------------	-------	---	--------------------

UNIT/ORGANIZING PRINCIPLE: History of Life on Earth; The theory of Evolution			Pacing: 3rd Nine Weeks Week 1 - 2	
Essential Question(s): 1. How did life begin, and how did life evolve on Earth? 2. Why is the scientific theory of evolution considered the fundamental concept underlying all of biology? 3. What scientific evidence supports the theory of evolution by natural selection?			Big Idea : How changes have occurred in organisms, over time.	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
The age of the Earth & how life evolved from prokaryote to eukaryote to multicellular organisms. How the theory of evolution by natural selection is one of the underlying principles of biology.	Describe how biological diversity is increased by the origin of new species and how it is decreased by the natural process of extinction. Describe the scientific explanations of the origin of life on Earth Describe the conditions required for natural selection, including; overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success. Discuss mechanisms of evolutionary change other than natural selection such as	SC.912.L.15.3 <i>Moderate</i> (not assessed) SC.912.L.15.8 <i>Moderate</i> (also assessed N.1.3, N.1.4 and N.2.1) SC.912.L.15.10 <i>Moderate</i> (assessed as 15.1) SC.912.L.15.14	Students will explore fossil evidence for evolution and the geologic time scale. They will be taught how fossils help biologists understand the history of life on Earth. They will be introduced to the patterns in which evolution has occurred. The students will be introduced to the diversity of life as the result of ongoing evolutionary change. The patterns of biodiversity that Darwin observed while traveling aboard the <i>Beagle</i> . And they will compare Darwin’s theory to other scientists’ work that helped Darwin to develop his theory of evolution by Natural Selection.	Biogenesis Spontaneous generation Radiometric Dating Radioactive isotope Fossil Chemosynthesis Cyanobacteria Endosymbiosis Evolution Natural selection Adaptation Vestigial structure Homologous structure Analogous structure Convergence Divergence Coevolution

	<p>genetic drift and gene flow.</p> <p>Explain how the scientific theory of evolution is supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observed evolutionary change.</p>	<p><i>Moderate</i> (assessed as 15.13)</p> <p>*SC.912.L.15.1 <i>High</i> (also assesses N.1.3, N.1.4, N.1.6, N.2.1, N.3.1, N.3.4 and L.15.10)</p>	<p>Lab might include: Lab – <i>Variation in a Population</i> Lab – <i>Insect Survival</i> – on black VS Peppered Moth</p> <p>Activity might include: <i>Adaptations</i> using models of various organisms. <i>Wall Chart</i> that will track the major events thought to have occurred around the time of the origin of life on Earth.</p>	
--	--	---	--	--

UNIT/ORGANIZING PRINCIPLE: Taxonomy and Introduction to the Kingdoms of Life			Pacing: 3rd Nine Weeks Week 3	
Essential Question(s): 1. How are organisms classified? 2. What are the 3 Domains of Life? 3. What are the 6 Kingdoms of organisms?			Big Idea : Classification; the variety of organisms on Earth	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
Linnaeus' systems of taxonomy	Describe how and why organisms are hierarchically classified and based on evolutionary relationships.	SC.912.L.15.4 <i>High</i> (Assessed as 15.6)	Students will gain understanding of modern evolutionary classification by constructing and interpreting information in cladograms.	Biodiversity Taxonomy Binomial nomenclature Species Phylogeny Cladistics
The modern concept of species	Explain the reasons for changes in how organisms are classified.	SC.912.L.15.5 <i>High</i> (assessed as 15.6)	The reasons for changes because organisms are still changing today as new data is gathered.	
Distinguishing characteristics of the 3 Domains and 6 Kingdoms	Discuss distinguishing characteristics of the domains (eubacteria, archaebacteria, and eukaryotes) and kingdoms of living organisms (animals, plants, fungi, etc.)	*SC.912.L.15.6 <i>Moderate</i> (also assessed N.1.3, N.1.6, L15.4, & 15.5)	The students will list the different characteristics for each domain for comparison. The same thing for the kingdoms. Labs might include: Lab – Using a <i>Taxonomic Key</i> – one classifying lizards or classifying sharks Lab – Adaptations of organisms	

UNIT/ORGANIZING PRINCIPLE: Populations and Ecosystems			Pacing: 3rd Nine Weeks Week 4-5	
Essential Question(s): 1. What are the categories of organisms in an ecosystem, and how do they interact with each other & with their environment? 2. What are the major biogeochemical cycles? 3. What are populations & how do they evolve?			Big Idea : Ecosystems and their inhabitants.	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
Interdependence of living organisms & their environment	Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity. Use a food web to identify and distinguish producers, consumers, and decomposer. explain the pathway of energy transfer through tropic levels and the reductions of available energy at successive tropic levels. Diagram and explain the biogeochemical cycles, including water, carbon, and nitrogen cycle.	*SC.912.L.17.5 <i>High</i> (also assesses N.1.4, L.17.2, 17.4 17.8) *SC.912.L.17.9 <i>Moderate</i> (also assesses E.7.1 and 17.10) SC.912.L.17.10 <i>Moderate</i> (assessed as 17.9)	We will explore ideas about populations and factors affecting population growth, in relation to interdependence in nature. We will discover how populations grow and what factors limit a the population's growth. The students will interpret information in maps, graphs, and diagrams to understand the food web and the energy transfer. The students will learn that biogeochemical cycle is a process in which elements, chemical compounds, and other forms of matter are passed from one organism to another and from one part of the biosphere to	Ecology Habitat Ecosystem Abiotic factors Biotic factors Habitat Niche Dormancy Producer Consumer Herbivores Carnivores Omnivores Detritivores Decomposers Trophic level Food chain Food web Biogeochemical cycle Water cycle Carbon cycle Nitrogen cycle

		<p>another.</p> <p>Labs might include: Lab – <i>Its Getting Crowded</i> on human Population growth Lab – <i>Dissecting Barn Owl Pellets</i> Lab – Doing a population count of quadrants in the practive field or ag lab area.</p> <p>Activities might include: Using Random Sampling Making a Barn Owl food chain.</p>	<p>Phosphorus cycle Population Immigration Emigration Exponential growth model Logistic growth Model Limiting factor Carrying capacity demography</p>
--	--	--	---

UNIT/ORGANIZING PRINCIPLE: Biological communities and The Environment			Pacing: 3rd Nine Weeks Weeks 6 – 7	
Essential Question(s): 1. What are the major types of interactions between species? 2. What role does succession play in changing ecosystem? 3. What are the major biological communities (biomes)?			Big Idea : Biomes; positive and adverse effects of humans on ecosystems	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
Biodiversity Succession Biomes	<p>Explain the general distribution of life in aquatic systems as a function of chemistry, geography, light, depth, salinity, and temperature</p> <p>Describe changes in ecosystems resulting from seasonal variations, climate change and succession.</p> <p>Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species</p>	<p>SC.912.L.17.2 <i>High</i> (assessed as 17.5)</p> <p>SC.912.L.17.4 <i>Moderate</i> (assessed as 17.5)</p> <p>SC.912.L.17.8 <i>High</i> (assessed as 17.5)</p>	<p>The students will learn that the existence of life on Earth depends on interactions among organisms and between organisms and their environment.</p> <p>The existence of life on Earth depends on interactions among organisms and between organisms and their environment.</p> <p>The students will be able to tell the difference between weather and climate. They will be able to identify the factors that influence climate.</p>	<p>Predation</p> <p>Symbiosis</p> <p>Parasitism</p> <p>Mutualism</p> <p>Commensalism</p> <p>Succession</p> <p>Climax community</p> <p>Biome</p> <p>Biodiversity</p> <p>Aquifer</p>

			<p>Activity might include: Assigning students to do research on various organisms. these can be of native VS exotic organisms in Florida; or various interesting organisms world-wide.</p> <p>Foldables on the different biomes and column charts to list their characteristics.</p> <p>Reading charts about Predator-Prey</p>	
--	--	--	---	--

UNIT/ORGANIZING PRINCIPLE: Biological Communities and the Environment			Pacing: 3rd Nine Weeks Week 8	
Essential Question(s): 1. What are the various type of pollution: 2. What profound effects have human activities and natural events had on populations, biodiversity, and ecosystem processes?			Big Idea : Biomes; positive and adverse effects of humans on ecosystems.	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
Human impact on ecosystems	Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species	SC.912.L.17.8 <i>Moderate</i> (assessed as 17.5)	The existence of life on Earth depends on interactions among organisms and between organisms and their environment. Introducing species can disrupt stable relationships in an ecosystem.	Biodiversity Pollution Smog Acid Rain Greenhouse effect Global warming Biological magnification Aquifer
	Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests.	SC.912.L.17.11 <i>High</i> (assessed s 17.20)		
	Analyze how environment and personal health are interrelated.	HE.912.C.1.3 (assessed as 17.20)		
	Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.	*SC.912.L.17.20 <i>High</i> (also assesses n.1.3, L17.11)	Pollution of Earth’s freshwater supply threatens habitat and health. Biomagnification causes accumulation of toxins in the food chain.	
			Lab - Acid Rain - “How does acid	

			rain affect plant growth?” Lab – Modeling “Biomagnification” Activity might include: Graphic Organizer - “Fishbone” to sort out all the pressures and effects that have an impact on air quality.	
--	--	--	---	--

UNIT/ORGANIZING PRINCIPLE: Introduction to Plants and Plant Reproduction			Pacing: 4th Nine Weeks Week 1 – 1 ¼	
Essential Question(s): 1. What are the major organs & functions of vascular plants? 2. How do plants reproduce?			Big Idea : Parts & Their Functions of Vascular Plants	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
Structure VS function in plants	Relate the structure of each of the major plant organs (roots, stems, leaves) and tissues (xylem and phloem) to physiological processes.	SC. 912.L.14.7 <i>Moderate</i>	Plant tissues are organized. The structure and function of roots help plants carry out life processes. The structure and function of the leaves help plants carry out the life processes also. The plant organs move materials through their bodies. Activities might includes: Vocabulary cards Diagrams of a longitudinal cross section of a root labeling root structures and number in sequence in which materials move into and through a root. Lab might include: Looking at stomata & guard cells under the microscope Lab – “How Capillary Action makes Water Go Up.”	Stroma Guard cells Vascular tissue Cambium Phloem Xylem Root Stem Transpiration Leaves Nonvascular plants Flower Pollinatin Seed Fruit Germination Vegetative reproduction

UNIT/ORGANIZING PRINCIPLE: Invertebrate Animals, and Arthropods in particular.			Pacing: 4th Nine Weeks Weeks 1 ½ - 3	
Essential Question(s): 1. What are the main phyla of invertebrate animals? 2. What are the main organ systems of invertebrate animals? 3. What characteristics make Arthropods, & insects particularly, the most numerous & successful animals?			Big Idea : Some of the major phyla of invertebrate animals .	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
The variety and adaptations of invertebrate animalsf	Describe how and why organisms are hierarchically classified and based on evolutionary relationships. Discuss distinguishing characteristics of the domains and kingdoms of living organisms 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.	SC.912.L.15.14 <i>High</i> (assessed as 15.6) *SC.912.L.15.6 <i>Moderate</i> (also assesses N.1.3, N.1.6, L.15.4 and L.15.5) SC.912.L.15.10 <i>Moderate</i> (assessed as 15.1)	Vertebrates are in the kingdom of Animalia Broken down by classification starting with Domain the largest category down to specific based on the characteristics. Animals have evolved diverse ways to carry out basic life processes and maintain homeostasis. Address misconception that <i>Homo sapiens</i> does not mean humans descended from monkeys by showing the cladogram indicating that humans and monkeys share a common primate ancestor, not evolved from monkeys	Vertebrate Ectotherm Endotherm Amniotes Monotremes Marsupials Placental mammals Oviparous Viviparous Primates Hominid Bipedalism

			<p>Activities might include: A time line for visual . Researching a recent hominine discoveries.</p> <p>Labs might include: Lab – <i>Investigating Hominoid Fossils.</i></p>	
--	--	--	--	--

UNIT/ORGANIZING PRINCIPLE: The Origin and Evolution of Mammals			Pacing: 4th Nine Weeks Weeks 4 - 6	
Essential Question(s): 1. What are some of the major adaptations mammals have for survival? 2. How did Primates evolve?			Big Idea : Vertebrate animals: mammals	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
The variety and adaptations of vertebrate animals.	Describe how and why organisms are hierarchically classified and based on evolutionary relationships. Discuss distinguishing characteristics of the domains and kingdoms of living organisms 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.	SC.912.L.15.14 <i>High</i> (assessed as 15.6) *SC.912.L.15.6 <i>Moderate</i> (also assesses N.1.3, N.1.6, L.15.4 and L.15.5) SC.912.L.15.10 <i>Moderate</i> (assessed as 15.1)	Vertebrates are in the kingdom of Animalia Broken down by classification starting with Domain the largest category down to specific based on the characteristics. Animals have evolved diverse ways to carry out basic life processes and maintain homeostasis. Address misconception that <i>Homo sapiens</i> does not mean humans descended from monkeys by showing the cladogram indicating that humans and monkeys share a common primate ancestor, not evolved from monkeys Activities might include:	Vertebrate Ectotherm Endotherm Amniotes Monotremes Marsupials Placental mammals Oviparous Viviparous Primates Hominid Bipedalism

			<p>A time line for visual . Researching a recent hominine discoveries. Labs might include: Lab – <i>Investigating Hominoid Fossils.</i></p>	
--	--	--	--	--

UNIT/ORGANIZING PRINCIPLE: Human Reproduction and Development			Pacing: 4th Nine Weeks Weeks 7-8	
Essential Question(s): 1. What are the structures and function of the male reproductive system? 2. What are the structures and function of the female reproductive system? 3. How does development occur from fertilization to embryo, to fetus, to new born? 4. What are some of the major STD's?			Big Idea : Human Reproduction	
Concepts/ Content	Learning Targets	Benchmarks	Essential Content & Understanding	Key Terminology (bold print priority items)
Human Reproductive system	Describe the basic anatomy and physiology of the human reproductive system. Describe the process of human development from fertilization to birth and major changes that occur in each trimester of pregnancy.	*SC.912.L.16.13 <i>Moderate</i>	The human body is a complex system. The coordinated functions of its many structures support life processes and maintain homeostasis. Remind students that the genetic content of sperm and ovum cells is different from somatic (body) cells and are formed by different processes. Use models for visual aid. Activities might include: Comparative review sheet for mitosis and meiosis. Write a paragraph comparing male reproductive system to the female reproductive system. Bullet point notes to address the different stages of fetal development	Testes Seminiferous Tubules Scrotum Epididymis Vas deferens Seminal vesicles Prostate gland Bulbourethral glands Semen Penis Ovary Fallopian tube Uterus Vagina Follicle Corpus luteum Menstrual cycle Placenta Fetus STD's

			by months. Research on a STD and report. Guess speaker from Health department to talk about STD's.	
--	--	--	--	--