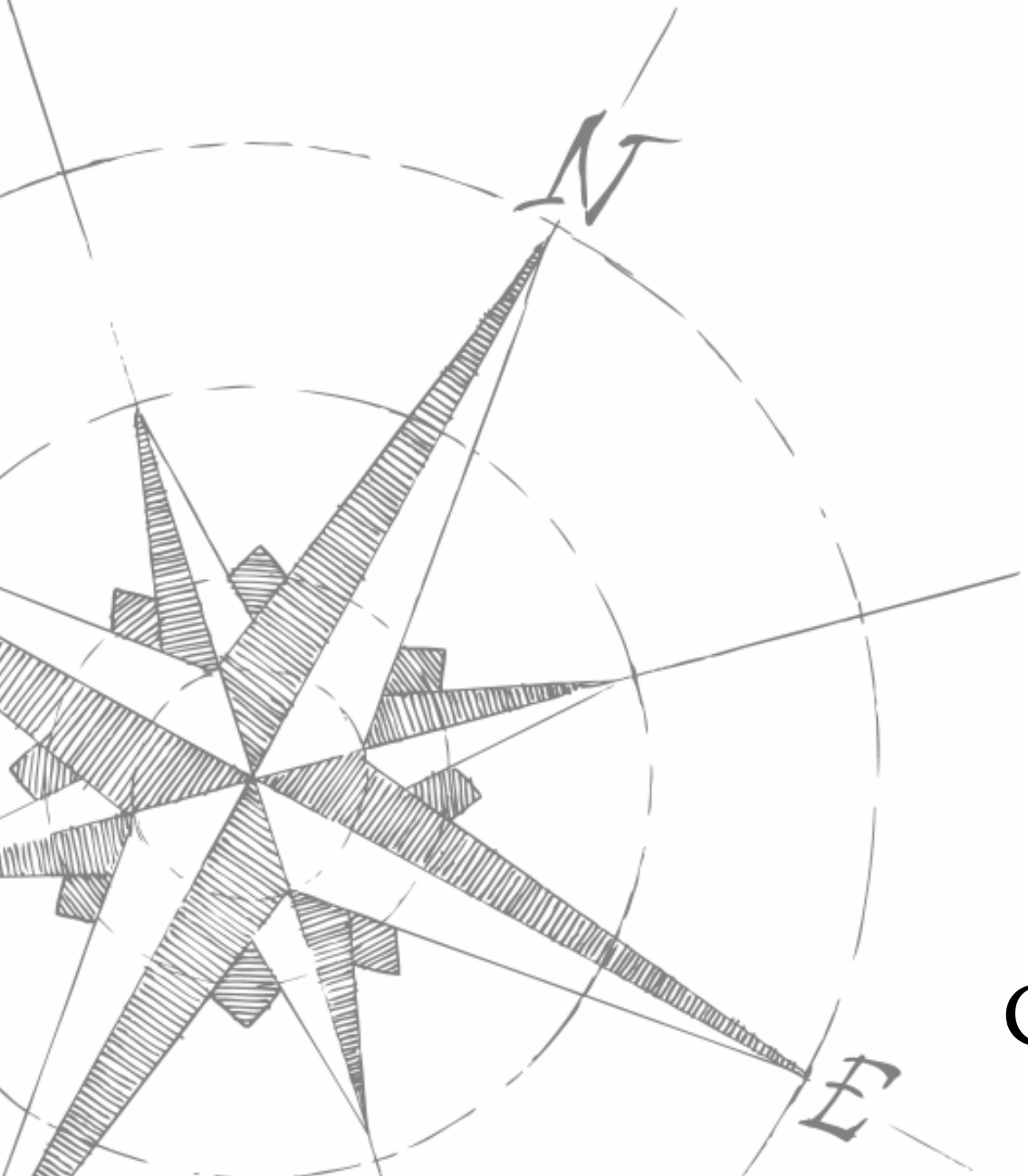
2012-2013

Volusia County Schools



Biology

Curriculum Map

Parts of the Curriculum Map

Body of Knowledge: the broadest organizational structure used to group content and concepts within the curriculum map

Pacing: time frames created by teacher committees, using EOC data, within which the course should be taught in preparation for the Biology EOC

Measurement Topics: concepts grouped together by related benchmarks used in Pinnacle for standards-referenced grading

Learning Targets and Skills: the content knowledge, processes, and enabling skills that will ensure successful mastery of the measurement topics

Benchmark: the Next Generation Sunshine State Standards required in the course descriptions posted on CPALMS by FLDOE

Academic Language: the content-specific vocabulary or phrases both teachers and students should use, and be familiar with, during instruction

Resources: a listing of available, high quality and appropriate materials, including: strategies, lessons, textbooks, videos and other media sources, that are aligned with the measurement topics

RARE week: (Review, Assess, Re-teach, and Enrich) specific days set aside for teachers to administer district assessments, go over the test items in class with students, and identify students who need additional remediation or enrichment

DIA:B: (District Interim Assessments: Biology) are content-specific tests developed by the district and teacher committees to assist teachers in monitoring student progress. The secondary goal is to prepare students for the EOC through similar rigor, complexity, and style guidelines as in state assessments.

Florida Biology End of Course (EOC) Exam Information

Content Breakdown by Benchmark					
Molecular and Cell Biology		Classification, Heredity, and Evolution		Organisms, Populations, and Ecosystems	
35% of EOC		25% of EOC		40% of EOC	
N.1.1 N.1.4 N.1.6 L14.4 **L.14.1** N.1.3 N.2.1 N.3.1 N.3.4 **L.14.3** L.14.2 **L.16.3** L.16.4 L.16.5 L.16.9	**L.16.17** L.16.8 L.16.14 L.16.16 **L.18.1** L.18.11 **L.18.9** L.18.7 L.18.8 L.18.10 **L.18.12**	**N.1.1** **L.15.1** L.15.10 N.1.3 N.1.4 N.1.6 N.2.1 N.3.1 N.3.4 **L.15.6** L.15.4 L.15.5 N.1.3 N.1.6	**L.15.8** N.1.3 N.1.4 N.2.1 **L.15.13** L.15.14 L.15.15 N.1.3 **L.16.1** L.16.2	**N.1.1** **L.14.7** **L.14.26** **L.14.36** **L.14.52** L.14.6 **L.16.10** **L.16.13**	**L.17.5** L.17.2 L.17.4 L.17.8 N.1.4 **L.17.9** E.7.1 **L.17.20** L.17.11 L.17.13 N.1.3

Item Cognitive Complexity		
Low	Moderate	High
10-20%	60-80%	10-20%

Duration and Length		
Sessions	Total Time	Total Items
2	160 minutes	60-66

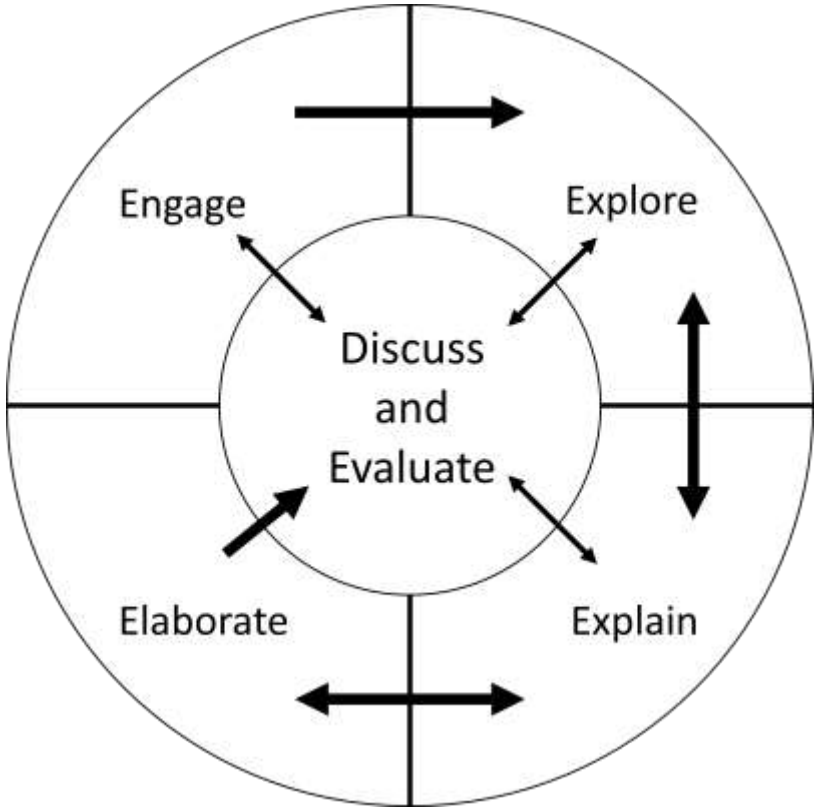
Use FCAT Explorer and Florida Achieves! For Student EOC help and Teacher resources

Recommendations for success on the EOC:

1. Use frequent formative assessment of measurement topics.
2. Students should have access to and use FCAT Explorer and Florida Achieves!
3. Instruction should be at the same level of rigor as the learning targets in the curriculum map.

Volusia County Science 5E Instructional Model

	Description	Implementation
Engage	Learners engage with an activity that captures their attention, stimulates their thinking, and helps them access prior knowledge. A successful engagement activity will reveal existing misconceptions to the teacher and leave the learner wanting to know more about how the problem or issue relates to his/her own world. *(e.g. ISN-preview, Probe, Teacher Demonstration…)*	The diagram below shows how the elements of the 5E model are interrelated. Although the 5E model can be used in linear order (engage, explore, explain, elaborate and evaluate), the model is most effective when it is used as a cycle of learning.
Explore	Learners explore common, hands-on experiences that help them begin constructing concepts and developing skills related to the learning target. The learner will gather, organize, interpret, analyze and evaluate data. *(e.g. investigations, labs…)*	
Explain	Learners explain through analysis of their exploration so that their understanding is clarified and modified with reflective activities. Learners use science terminology to connect their explanations to the experiences they had in the engage and explore phases. *(e.g. Lecture, ISN-notes, Research, Close-reading, reading to learn, videos, websites…)*	
Elaborate	Learners elaborate and solidify their understanding of the concept and/or apply it to a real world situation resulting in a deeper understanding. Teachers facilitate activities that help the learner correct remaining misconceptions and generalize concepts in a broader context. *(e.g. labs, web-quest, presentations, debate, discussion, ISN-reflection…)*	
Evaluate	Teachers and Learners evaluate proficiency of learning targets, concepts and skills throughout the learning process. Evaluations should occur before activities, to assess prior knowledge, after activities, to assess progress, and after the completion of a unit to assess comprehension. *(i.e. formatives and summatives)*	Each lesson begins with an engagement activity, but evaluation occurs throughout the learning cycle. Teachers should adjust their instruction based on the outcome of the evaluation. In addition, teachers are encouraged to differentiate at each state to meet the needs of individual students.



*Adapted from The BSCS 5E Instructional Model: Origins, Effectiveness, and Applications, July 2006, Bybee, et.al, pp. 33-34.

Cognitive Complexity

The benchmarks in the Next **Generation Sunshine State Standards (NGSSS)** identify knowledge and skills students are expected to acquire at each grade level, with the underlying expectation that students also demonstrate critical thinking.

The categories—**low complexity**, **moderate complexity**, **high complexity**—form an ordered description of the demands a test item may make on a student. Instruction in the classroom should match, at a minimum, the complexity level of the learning target in the curriculum map.

Low	Moderate	High
This category relies heavily on the recall and recognition of previously learned concepts and principles. Items typically specify what the student is to do, which is often to carry out some procedure that can be performed mechanically. It is not left to the student to come up with an original method or solution.	This category involves more flexible thinking and choice among alternatives than low complexity items. They require a response that goes beyond the habitual, is not specified, and ordinarily has more than a single step or thought process. The student is expected to decide what to do—using formal methods of reasoning and problem-solving strategies—and to bring together skill and knowledge from various domains.	This category makes heavy demands on student thinking. Students must engage in more abstract reasoning, planning, analysis, judgment, and creative thought. The items require that the student think in an abstract and sophisticated way often involving multiple steps.
Students will: • **identify** a common example or **recognize** a concept; • **retrieve information** from a chart, table, diagram, or graph; • **recognize** a standard scientific representation of a simple phenomenon; or • **calculate** or **complete** a familiar single-step procedure or equation using a reference sheet.	Students will: • **apply** or **infer** relationships among facts, terms, properties, or variables; • **describe** examples and non-examples of scientific processes or concepts; • **predict** or **determine** the logical next step or outcome; • **compare** or **contrast** structures or functions of different organisms or systems; • **choose** the appropriate formula or equation to solve a problem and then solve it; or • **apply** and **use concepts** from a standard scientific model or theory.	Students will: • **construct** models for research; • **generalize** or **draw conclusions**; • **design** an experiment, given data and conditions; • **explain** or **solve** a problem in more than one way; • **provide a justification** for steps in a solution or process; • **analyze** an experiment to identify a flaw and propose a methods for correcting it; • **interpret**, **explain**, or **solve** a problem involving spatial relationships; or • **predict** a long-term effect, outcome, or result of a change within a system.

*Adapted from Webb's Depth of Knowledge and FLDOE FCAT 2.0 Specification Documentation

Biology I
Instruction and Assessment

Biology 1			2012-2013
Week	**Dates**	**Measurement Topic**	**Assessments**
1	August 20 – 24	Science Process	DIA:B 1. Science Process 2. Ecology
2	August 27 - 31	Taxonomy	
3-4	September 4 – 14	Plants	
5-6	September 17 – 28	Matter and Energy in an Ecosystem	
7-8	October 1 – 12	Interdependence and Human Impact	
9	October 15 – 18	RARE	
10-11	October 22 – November 2	Water, Macromolecules, and Enzymes	DIA:B Cellular Structures & Processes
12	November 5 – 7	Cell Theory	
12-14	November 8 – 20	Cell Structure and Function	
15	November 26 – December 7	Cell Membrane and Transport	
16-17	December 10 – 14	Photosynthesis and Cellular Respiration	
18	December 17 – 20	RARE	
Winter break			
19-20	January 7 – 18	DNA and Protein Synthesis	DIA:B Heredity & Cell Reproduction
21-23	January 22 – February 8	Cell Cycle, Mitosis, and Meiosis	
24-25	February 11 – 22	Genetics	
26	February 25 – March 1	Biotechnology	
27	March 4 – 8	RARE	
28-29	March 12 – 22	Origin of Life and Evidence of Evolution	DIA:B Evolution & Human Health
Spring break			
30-31	April 1 – 12	Mechanisms of Change	
32	April 15 – 19	Human Growth and Development	
33	April 22 – 26	Human Health	
34	April 29 – May 3	Human Impact	
35	**May 6 – 10**	**Biology EOC**	
36	May 13 – 17	RARE	
37-39	May 13 –June 4	Bridge to Chemistry	Finals

Other Assessments:

1. **Semester Formative Assessment (SFA)** - State required, consisting of approximately 20 questions covering topics through winter break.
2. **Semester Summative Assessment (SSA)** - State required, same test as SFA, given later in the year.

Body of Knowledge: The Nature of Science		August 20 – August 24	
Measurement Topics	**Learning Targets and Skills**	**Benchmarks**	**Academic Language**
Week 1 **What is Science** **(T02)** **Science Process** **(T01)**	Students will: • **(T02) explain** that science is the study of the natural world • **(T02) explain** what Biologists study • **(T02) differentiate** between science and non-science • **(T02) explain** why something would fail to meet the criteria for science • **(T02) identify** which questions can be answered through science and which questions cannot • **(T02) set up** an interactive science notebook	**SC.912.N.2.1** **SC.912.N.2.2**	Science Non-science Pseudoscience

	Students will:
	• **(T01) design** a controlled experiment on a biology topic
	• **(T01) use tools** *(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)*
	• **(T01) collect**, **analyze**, and **interpret** data from the experiment to draw conclusions
	• **(T01) determine** an experiment's validity and **justify** its conclusions based on:
	  ○ control group
	  ○ limiting variables and constants
	  ○ multiple trials (repetition) or large sample sizes
	  ○ bias
	  ○ method of data collection, analysis, and interpretation
	  ○ communication of results
	• **(T01) describe** the difference between an observation and inference
	• **(T01) use appropriate evidence** and reasoning to justify explanations to others
		SC.912.N.1.1
		SC.912.N.1.3
		SC.912.N.1.4
		SC.912.N.1.6
			Reliability
			Validity
			Bias
			Peer review
			Control group
			Limiting variables
			Multiple trials
			Inference
			Observation
			Analysis
			Interpretation
			Evidence

Resources	What is Science (Week 1)	Science Process (Week 1)
Text book	Sections 1.1, 1.2	Sections 1.3, 1.4, 1.5
Lab Binder	Unit 1, pp.1-15	Unit 1, pp.1-15
Safari Montage		
Websites	Virtual Museum	Using the Scientific Process to study Evolution
Keeley Probes	Volume 1 #14 (Mittens,) #15 (Objects and Temperature)	Volume 3 #12 (Doing Science)
Teacher Hints	**Instruction Hints:** 1. Evaluate advertised claims of pseudoscience such as astrology; have students justify why it is pseudoscience and not science.	**Instruction Hints:** 1. Research shows that students learn more effectively with hands-on learning and are able to retain this information when the experience is relevant. In addition, students need opportunities to ask their own questions and have opportunities to develop their own investigations. The next three weeks gives you an opportunity to review students on the basics of scientific investigations, tools and measurements. During these three weeks, students should have multiple opportunities to explore the science process. There are no required labs during this unit. Use this opportunity to engage and hook students using various content-based labs. 2. It is very important that students are able to collect, organize and analyze data. Students will be required to analyze graphs on the Biology EOC.
Prefix / Suffix	**Sample FOCUS Question**	**Sample FOCUS Question**
No/Non - not *Sciencia- wisdom* *Pre-* before *Dici- to say* *Bio- life* *-ology- study*	Sometimes scientists must make assumptions about their subject of study because some aspect of it cannot be tested directly. In cases like this, scientists assume that the natural world operates in a consistent fashion. Which of the following would be the best example of a case in which scientists would have to make an assumption based on present experience? 1. assuming that modern DNA is composed of the same nucleotide bases that made up DNA 1,000 years ago 2. assuming that rainfall patterns in the northern United States are similar to rainfall patterns there 50 years ago 3. assuming that trees in Brazil use the chlorophyll in their leaves for photosynthesis in the same way trees in Florida do 4. assuming that the feathers on a dinosaur skeleton were used for flight and insulation as they are in modern birds	Each summer, Janine spends two weeks visiting her grandparents, who live near a beach. She notices that the shore in one area appears to erode more each year than any other area. Which of the following would be the best way to determine if different areas of this beach experience more erosion than others each year? 1. Find out what factors contribute most to the erosion of the beach each year. 2. Compare the physical features of this beach to those of beaches in other towns. 3. Take photographs of all areas of the beach over several years to look objectively for differences. 4. Survey the residents who live near the beach year round to see if they notice any changes in erosion.

Body of Knowledge: Taxonomy, Ecology, and Plants		August 27 – September 14	
Measurement Topics	**Learning Targets and Skills**	**Benchmarks**	**Academic Language**
Week 2 **Taxonomy** **(T04)**	Students will: • **(T04) describe** how and why organisms are hierarchically classified and based on evolutionary relationships • **(T04) interpret** a cladogram • **(T04) create** a cladogram to compare the characteristics of five or more organisms	**SC.912.L.15.4**	Taxonomy Classification Hierarchy Phylogeny Binomial nomenclature Genus Species Cladogram Autotroph Heterotroph Prokaryote Eukaryote
	Students will: • **(T04) explain** the reasons for changes in how organisms are classified *(e.g. technological advances such as genetic fingerprinting, new evidence from molecular analysis (cell wall in bacteria and archaea), and the discovery of new organisms)*	**SC.912.L.15.5**	

	Students will:
	• **(T04) classify** the three domains using distinguishing characteristics: (*Archea, Bacteria, and Eukarya)*
	• **(T04) classify** the six kingdoms using distinguishing characteristics: *(Archea, Eubacteria, Protista, Fungi, Plantae, and Animalia)*
	• **(T04) distinguish** whether organisms are:
	  ○ prokaryotic vs. eukaryotic
	  ○ unicellular vs. multi-cellular
	  ○ autotrophs vs. heterotrophs
		SC.912.L.15.6	

Week 3-4
(9 days)
 	
Plants
(T08)
	Students will:
	• **(T08) explain** how the following plant organs and tissues are directly related to the four physiological processes:
	  ○ photosynthesis (leaves, stomata, guard cells, stems, phloem)
	  ○ cellular respiration (leaves, stomata, guard cells, stems)
	  ○ transpiration (leaves, stomata, guard cells, roots, xylem)
	  ○ reproduction (flowers, stamen, pistil, fruits, cones, seeds, cambium)
	• **(T08) explain** the role of plant tissues *(meristematic, ground, dermal and vascular tissues*) with respect to plant organs
	• **(T08) compare and contrast** the structures of monocot and dicot plants
		SC.912.L.14.7	Vascular
			Nonvascular
			Xylem
			Phloem
			Dermal tissue
			Meristematic tissue
			Guard cells
			Ground tissue
			Cambium
			Transpiration
			Stomata

Resources	Taxonomy (Week 2)	Plants (Week 3-4)
Text book	Sections 17.1, 17.2, 17.3, 17.4	Sections 21.1, 21.2, 21.3, 21.4, 22.2, 22.4
Lab Binder	Unit 6, pp.1-13	Unit 7, pp.15-26, pp.27-40
Safari Montage		
Websites	Sorting Sea Shells, Bacterial ID Virtual Lab	
Keeley Probes	Volume 1 #16 (Is It an Animal?) Volume 2 #12 (Is it a Plant?)	Volume 2 #13 (Needs of seeds) Volume 2 #15 (Plant Food)
Teacher Hints	**EOC Hints:** 1. Items will describe the characteristics of an organism and assess its classification. 2. The Biology EOC will assess 3 domains and 6 kingdoms listed in the Learning Targets. 3. The Biology EOC will only ask details about the following kingdoms: Protista, Fungi, Plantae, and Animalia. 4. Items may address evolutionary classification, phylogeny, and the use of cladograms. Students will have to know how to read a cladogram (book pg. 525). **Instruction Hints:** 1. Please talk with your students about the changes in the number of systems over the years. There is a section in your book that shows the evolution of the system, pg. 533.	**EOC Hints:** 1. Plants tissues will be new to students. The items should be conceptual. 2. The specifications only list the tissue and structures listed in the learning targets. **Instruction Hints:** 1. Students will have already learned in elementary and middle school the major structures and functions of plants.

Prefix / Suffix	Sample FOCUS Question	Sample FOCUS Question
Tax- arrange *Nomia- method* *Phylo- race/group* *Bi- two* *Nomen- name* *klados- offshoot* *gram- graph/metric* *auto-self* *hetero- different* *trophos- feeder* *pro- first* *eu- true* *xylon- wood* *meristos- to divide* *spirare- to breathe*	All prokaryotes reproduce asexually, while many eukaryotes can reproduce sexually. Given this information, which statement best explains why the Eukarya domain includes more complex living things than the Archaea or Bacteria domains? 1. All prokaryotes are unicellular, and all eukaryotes are multicellular. 2. Prokaryotes can live in more extreme conditions than eukaryotes. 3. Eukaryotes have a greater variety of genetic material than prokaryotes. 4. There are more eukaryotic organisms than prokaryotic organisms in the world.	When Mr. Williams was mowing the yard, he accidentally hit a young tree with the mower and scraped off a large section of bark all the way down to the wood. Within a few days, leaves on several of the branches began to die. What is the most likely cause of the leaves dying? 1. The leaves were diseased already, and they died coincidentally when the bark was injured. 2. The wood was weakened by the injury and could no longer support the weight of the branches above it. 3. The bark contained the xylem and phloem tubes and, once they were damaged, they could not feed the leaves. 4. The vascular tissue under the bark was damaged and could no longer transport water and nutrients to the leaves.

Body of Knowledge: Taxonomy, Ecology, and Plants		September 17 – October 5	
Measurement Topics	**Learning Targets and Skills**	**Benchmarks**	**Academic Language**

Week 5-6
(9 Days)
 	
Matter & Energy in an Ecosystem
(T05)
	Students will:
	• **(T05) use** a food web to **identify and distinguish** roles:
	  ○ producers, consumers, and decomposers
	• **(T05) describe** the energy pathways through the different trophic levels of a food web and energy pyramid
	  ○ Primary
	  ○ Secondary
	  ○ Tertiary consumer
	• **(T05) explain** the transfer of energy through trophic levels and **predict** the reduction of available energy at successive levels due to metabolism in each of the lower trophic levels (10% Rule)
		SC.912.L.17.9	Producer
			Consumer
			Primary
			Secondary
			Tertiary
			Food chain
			Food web
			Decomposer
			Trophic level
			Energy transfer
			Joules
			Energy pyramid
			Metabolism

	Students will: • **(T05) analyze** the movement of matter through the water and carbon cycles (biogeochemical cycles)	**SC.912.E.7.1**	Hydrologic Cycle Biogeochemical Cycle Biomass
Week 7 **(2 Days)** **Human Impact** **(T07)** **Theories, Laws, and Models** **(T03)**	Students will: • **(T03) identify** ways in which a scientific claim is evaluated *(e.g., through scientific argumentation, critical and logical thinking, and/or consideration of alternative explanations)* • **(T03) evaluate** scientific claims focused on the impacts on the environment and renewable and nonrenewable resources	**SC.912.N.1.3**	Scientific claim Renewable resources Non-renewable resources Pollution Smog Acid rain Greenhouse effect Global warming Fossil fuels Indicator species Biomagnification Bioaccumulation Habitat fragmentation Sustainability
	Students will: • **(T07) predict** the impact of individuals on environmental systems and examine how human lifestyles affect sustainability • **(T07) discuss** the need for adequate monitoring of environmental parameters when making policy decisions • **(T07) evaluate** the possible environmental costs and benefits resulting from the use of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests	**SC.912.L.17.11** **SC.912.L.17.13** **SC.912.L.17.20**	

Resources	Matter & Energy in an Ecosystem (Week 5-6)	Human Impact (Week 7)
Text book	Sections 13.3, 13.4, 13.5, 13.6	Sections 16.1, 16.2, 16.3, 16.4, 16.5
Lab Binder	Unit 5, pp.1-13	Unit 5, pp. 43-53
Safari Montage		
Websites		
Keeley Probes	Volume 3 #19 (Earth's Mass) Volume 1L #15 (Food Chain)	Volume 3 #11 (Is It a Theory) Volume 4 #20 (Global Warming)
Teacher Hints	**EOC Hints:** 1. Items referring to organisms in a food web are limited to the impact on changes in matter or energy in trophic levels. 2. Items addressing food webs will require application of the knowledge of roles of organisms in a food web to describe energy pathways rather than the identification of producers, consumers (primary, secondary, tertiary), and decomposers. 3. Items referring to the biogeochemical cycles may address but will not assess photosynthesis and cellular respiration in isolation. 4. Scenarios will address energy in joules (J). **Instruction Hints:** 1. Students will be given different examples of food pyramids and be asked to draw conclusions on the different energy levels when compared to one another. Students must be able to explain that the changes are due to the loss of energy through metabolism in each of the lower trophic levels. (10% rule)	**EOC Hints:** 1. Items will focus on the environmental costs and benefits of using those resources and not on identifying different types. 2. Students will not be required to know specific environmental regulations, pollution prevention technologies or devices, or other mechanisms used. **Instruction Hints:** 1. Students have already been assessed on comparing renewable and non-renewable resources in 5th and 8th grade. Although you may need to review the differences, students will not be assessed on examples of each.
Prefix / Suffix	**Sample FOCUS Question**	**Sample FOCUS Question**
Pri- first *Sec- second* *Tert- third* *Trophic- feeder* *Trans- through* *Fer- carry* *Hydro- water* *Bio-life* *Geo-earth* *Magna- big/great* *Ac- toward/adding* *Cumulare- heap up*	Energy flows through the trophic levels of a food web. Which of the following statements regarding this flow of energy is true? 1. Generally, only 10% of energy is transferred from one trophic level to the next. 2. Energy is neither created nor destroyed; therefore, it is fully transferred to each trophic level. 3. Ecological pyramids diagram the flow of energy with producers at the top and consumers at the bottom. 4. Energy flows down from the top consumers to other carnivores, then herbivores, and finally down to the producers.	Most deforestation occurs for agricultural purposes as farmers cut and burn forests to grow crops. On a local scale, animals living in the forested area will either die or be forced from their habitat. On a larger scale, many plant and animal species may become extinct. What is another global effect of deforestation? 1. Production of fossil fuels will decrease as foliage is destroyed. 2. Soil erosion will decrease as ash covers and protects the topsoil. 3. Herbivore populations will increase as more plants become available for food. 4. Greenhouse gases will increase as carbon dioxide is released into the atmosphere.

Body of Knowledge: Taxonomy, Ecology, and Plants		October 1 – October 18	
Measurement Topics	**Learning Targets and Skills**	**Benchmarks**	**Academic Language**
Week 7-8 **Interdependence** **(T06)**	Students will: • **(T06) use data and information** about population dynamics (births, deaths, immigration, and emigration), biotic factors and abiotic factors, to **explain** and or **analyze** a change in carrying capacity and its effect on population size in an ecosystem • **(T06) predict** changes in population size given data	**SC.912.L.17.5**	Habitat Niche Competition Predation Parasitism Population density Immigration Emigration Carrying capacity Succession Climax community Invasive species Non-native species Biodiversity Limiting factors
	Students will: • **(T06) predict and explain** potential changes to an ecosystems resulting from: ○ *seasonal variations, climate change, and succession*	**SC.912.L.17.4**	
	Students will: • **(T06) describe** how biodiversity declines because of: ○ *catastrophic events, climate changes, human activity and the introduction of invasive and nonnative species* • **(T06) identify and explain** positive and negative consequences that result from the reduction in biodiversity • **(T06) make predictions** of consequences, based on a scenario if biodiversity is reduced	**SC.912.L.17.8**	
	Students will: • **(T06) explain** that pH, oxygen, carbon dioxide, nitrogen, phosphorous and salinity determine what organisms exist in aquatic systems • **(T06) explain** that different types of organisms exist within an aquatic system due to geography, including, depth, latitude, temperature, underwater topography, light and proximity to land Students will NOT have to identify oceanic zones.	**SC.912.L.17.2**	Ecology Aquatic Topography Abiotic Biotic Community Ecosystem Salinity
Week 9 **(4 Days)** **RARE**	1. Review and Catch-up 2. Administer DIA:B 3. Administer DIA:B 4. Go over test with students, question by question, with meaningful feedback then Re-teach and Enrich		

Resources	Interdependence (Week 7-8)	Teacher Notes
Text book	Sections 13.1, 13.2, 14.1, 14.2, 14.3, 14.4, 14.5	
Lab Binder	Unit 1, pp.1-15, Unit 5, pp.15-30	
Safari Montage		
Websites	Symbiotic Bioluminescence	
Keeley Probes	Volume 1L #17 (No More Plants)	
Teacher Hints	**EOC Hints:** 1. Items will not require the identification of oceanic zones. 2. Items referring to the reduction of biodiversity will include examples of catastrophic events, climate changes, human activities, and the introduction of invasive and noninvasive species, but students will not have to have specific knowledge of these. 3. Items referring to biodiversity will focus on the consequence and not require specific knowledge of the event that lead to the reduction. 4. Items addressing climate change are limited to biodiversity and population dynamics contexts. **Instruction Hints:** 1. Students will need to practice making predictions based on scenarios and justifying their predictions.	

Prefix / Suffix	Sample FOCUS Question	Teacher Notes
Im- in *Em- out* *Migrare- to move* *Cedere- to move* *Eco- habitat* *Aqua- water* *Topo- top* *Graphy- measure* *a- not* *biotic- life* *sal- salt*	In the 1930s, the Red Imported Fire Ant was accidentally introduced into the United States. This species is native to South America, but has thrived in the United States because of a lack of natural enemies here. Which of the following best explains how the Red Imported Fire Ant has affected native ant species in the U.S. that do have predators? 1. Native ant species preyed on the Red Imported Fire Ant and increased in population. 2. Native ant species interbred with the Red Imported Fire Ant, creating new ant species. 3. The Red Imported Fire Ant caused native ant species to become more susceptible to predators. 4. The Red Imported Fire Ant caused a decline in native ant species by competing for their resources.	

Body of Knowledge: Cell Structure, Function, and Processes		October 22 – November 2	
Measurement Topics	**Learning Targets and Skills**	**Benchmarks**	**Academic Language**

Week 10-11
 	
Water, Macromolecules, & Enzymes
(T09)
	Students will:
	• **(T09) describe** the special properties of water:
	  ○ hydrogen bonding, polarity, cohesive behavior
	  ○ ability to moderate temperature, expansion upon freezing
	  ○ versatility as a solvent
	• **(T09) explain** how each property of water above makes water essential for life on Earth
		SC.912.L.18.12	Polar molecule
			Hydrogen bond
			Adhesion
			Cohesion
			Solute
			Solvent
			Specific heat
			pH

	Students will:
	• **(T09) identify** the basic structure of the four types of biological macromolecules:
	  ○ *carbohydrates, lipids, proteins, nucleic acids*
	• **(T09) describe** the function of the four major types of biological macromolecules:
	  ○ *carbohydrates, lipids, proteins, nucleic acids*
		SC.912.L.18.1	Macromolecules
			Monomer
			Polymer
			Carbohydrates
			Lipids
			Fatty acid
			Proteins
			Nucleic acids
			Amino acid
			Chemical reaction
			Equilibrium
			Activation energy
			Reaction rate
			Catalyst
			Enzyme
			Denature

	Students will: • **(T09) Identify & describe** the effect of environmental factors, pH, temperature and concentration on enzyme activity • **(T09) explain** how enzymes speed up the rate of a biochemical reaction by lowering the reaction's activation energy • **(T09) predict** what happens to an enzyme when conditions are changed (pH, temperature or concentration) • **(T09) analyze a graph** containing data from an experiment and **draw conclusions** about: *activation energy, energy released and whether the reaction was endothermic or exothermic*	**SC.912.L.18.11**	

Resources	Water, Macromolecules, and Enzymes (Week 10-11)	Teacher Notes
Text book	Sections 2.1, 2.2,2.3, 2.4, 2.5	
Lab Binder	Unit 1, pp.17-28	
Safari Montage		
Websites	Molecular Structure of Fat, Small-Molecule Diversity	
Keeley Probes		
Teacher Hints	**EOC Hints:** 1. Items will not refer to intermolecular forces found in the four types of macromolecules. 2. Items will not assess hydrolysis and dehydration synthesis. 3. Items referring to the role of enzymes as a catalyst will use a biological context and will not require knowledge of specific enzymes. 4. Items will not assess enzyme-substrate complex. **Instruction Hints:** 1. Students will have to know the unique properties of water that allows Earth to be the only planet with life. They should be able to give examples of how the properties of water contribute to sustaining life. 2. Good practice assessment items on page 62, items 33-35. 3. Students should be able to interpret a graph from an enzyme lab showing catalysts and activation energy.(pg. 54 in book) 4. Students should have a lab experience studying the effects of changing temperature, pH and concentrations.	

Prefix / Suffix	Sample FOCUS Question	Teacher Notes
Ad- toward *Co- with* *Herare- sticking* *Solvere- dissolve* *Mono- one* *Poly- maner* *Carbo- carbon* *Hydro- water* *Lip- fat* *Pro- first* *Amon- nitrogen* *Equil- balanced* *Act- capable* *Lysis- cut*	A carbohydrate is an organic compound that is composed of carbon, hydrogen, and oxygen. The unique structure of carbohydrates makes them useful material for building cell walls in plants. Which of the following is a function of carbohydrates in animals? 1. digesting food 2. fighting disease 3. storing short-term energy 4. transmitting nerve impulses	

<table>
<tr><th colspan="2">Body of Knowledge: Cell Structure, Function, and Processes</th><th>November 5 – November 20</th><th></th></tr>
<tr><th>Measurement Topics</th><th>Learning Targets and Skills</th><th>Benchmarks</th><th>Academic Language</th></tr>
<tr><td rowspan="2">Week 12
(2 days)

The Origin of Life & Cell Theory
(T10)

Theories, Laws, & Models
(T03)</td><td>Students will:
(T10) describe current the cell theory
(T03) explain how continuous investigations by multiple scientists and new scientific information influenced the cell theory
(T10) compare and contrast the structure and function of various types of microscopes: compound, dissecting, scanning, transmission and electron
(T10) explain how changes in microscopes lead to modern cell theory</td><td>SC.912.L.14.1
SC.912.L.14.4</td><td>Cell Theory
Microscopes</td></tr>
<tr><td>Students will:
(T03) differentiate and explain that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions</td><td>SC.912.N.3.1
SC.912.N.3.4</td><td>Theory
Laws</td></tr>
<tr><td>Week 12-14
(9 Days)

Cell Structure & Function
(T11)</td><td>Students will:
(T11) compare and contrast the general structures found in:
<table>
<tr><th>Prokaryotic Cells</th><th colspan="2">Eukaryotic Cells</th></tr>
<tr><td>cell wall</td><td>cell wall</td><td>microtubules</td></tr>
<tr><td>cell membrane</td><td>cell membrane</td><td>microfilaments</td></tr>
<tr><td>cytoplasm</td><td>cytoplasm</td><td>vacuoles</td></tr>
<tr><td>plasmid</td><td>nucleus</td><td>mitochondria</td></tr>
<tr><td>ribosome</td><td>nuclear envelope</td><td>Golgi apparatus</td></tr>
<tr><td>flagella</td><td>nucleolus</td><td>chloroplasts</td></tr>
<tr><td></td><td>chromatin</td><td>lysosomes</td></tr>
<tr><td></td><td>ribosome</td><td>cilia</td></tr>
<tr><td></td><td>endoplasmic reticulum</td><td>flagella</td></tr>
</table>
(T11) compare and contrast general structures of plant and animal cells
(T11) describe how cell structures are directly related to their functions in the cell</td><td>SC.912.L.14.3</td><td>Organelle
Membrane-bound
Boundary
Barrier</td></tr>
</table>

Resources	Cell Theory (Week 12)	Cell Structure and Function (Week 12-14)
Text book	Sections 2.1, 2.2,12.3, 12.4, 12.5	Section 3.2
Lab Binder	Unit 1, pp.17-28, Unit 4, pp.31-46	Unit 2, pp.1-12
Safari Montage		
Websites		
Keeley Probes	Volume 1 #18 (Is It made of Cells?) Volume 1L # (Cucumber)	Volume 1L #8 (Chlorophyll)
Teacher Hints	**EOC Hints:** 1. Items may asses how contributions of scientists such as Van Leeuwenhoek, Hooke, Schwann, Schleiden and Virchow aided in the development of the cell theory but will not assess what each scientist contributed.	**EOC Hints:** 1. Items will not address protists or fungi or assess cellular structures unique to protists or fungi.
Prefix / Suffix	**Sample FOCUS Question**	**Sample FOCUS Question**
Micro- small *Scope- to see* *Nuc- center* *Cyto- hollow* *-plasm- to form* *Chloro- green* *-plast- form* *Mitos- thread* *Khondros -grain* *Vacuo- space* *Trans- across* *Port- gateway* *Flag- whip* *Lysis- to cut* *Cilia- hair*		Which of the following statements correctly explains the function of the Golgi apparatus within a cell? 1. The Golgi apparatus uses oxygen to convert sugar into chemical energy and also controls the metabolism of the cell. 2. The Golgi apparatus contains most of the genetic material within the cell and is responsible for gene expression and DNA replication when the cell divides. 3. The Golgi apparatus prepares new macromolecules such as fats and lipids by sorting and encasing them before sending them to the correct destination within a cell. 4. The Golgi apparatus breaks down molecules that are not needed within the cell, and returns some of the products of digestion to the cell for use in building new cell parts.

Body of Knowledge: Cell Structure, Function, and Processes		November 26 – December 20	
Measurement Topics	**Learning Targets and Skills**	**Benchmarks**	**Academic Language**
Week 15 **Cell Membrane & Transport** **(T12)** **Theories, Laws, & Models** **(T03)**	Students will: • **(T12) describe how** structures in plant and animal cells are directly to cell membrane transport • **(T12) explain** the role of cell membranes during passive and active transport • **(T12) predict and explain** what would occur if a plant or animal cell is placed in a hypotonic, hypertonic or isotonic solution • **(T12) explain** why cells are small and how they limit their size • **(T03) create** a model to simulate how a cell membrane works	**SC.912.L.14.2**	Phospholipid Fluid Mosaic Model Selective permeability Active transport Passive transport Concentration gradient Isotonic Hypertonic Hypotonic Diffusion Osmosis
Week 16-17 **Photosynthesis & Cellular Respiration** **(T13)**	Students will: • **(T13) identify** the reactants, products, and basic functions of photosynthesis • **(T13) identify** the reactants, products, and basic functions in the different types of cellular respiration: ○ aerobic ○ anaerobic	**SC.912.L.18.7** **SC.912.L.18.8**	ATP ADP Aerobic Anaerobic Photosynthesis Cellular respiration Reactants Products Chlorophyll
	Students will: • **(T13) compare and contrast** the products and reactants of cellular respiration and photosynthesis and how they are interrelated • **(T13) connect** the role of adenosine triphosphate (ATP) to energy transfers within a cell	**SC.912.L.18.9** **SC.912.L.18.10**	
Week 18 **(4 Days)** **RARE**	1. Review and Catch-up 2. Administer DIA:B 3. Go over test with students, question by question, with meaningful feedback 4. Re-teach and Enrich		

Resources	Cell Membrane and Transport (Week 15)	Photosynthesis and Cellular Respiration (Week 16-17)
Text book	Sections 3.3, 3.4, 3.5	Sections 4.1, 4.2, 4.3, 4.4, 4.5, 4.6
Lab Binder	Unit 2, pp.1-12	Unit 2, pp.13-28
Safari Montage		
Websites		
Keeley Probes	Volume 2 #18 (Whale and Shrew) Volume 4 #14 (Chicken Eggs)	Volume 2 #16 (Giant Sequoia) Volume 3 #17 (Respiration)
Teacher Hints	**EOC Hints:** 1. Items on cellular transport will be lab scenario based. Students should have lab experiences to support their understanding of placing cells in isotonic, hypotonic and hypertonic solutions. Students need to be able to justify their predictions.	**EOC Hints:** 1. Items will not require the memorization of the stages, specific events or intermediate molecules produced during these processes. 2. Items will not require the balancing of equations although scenarios will refer to chemical equations. **Instruction Hints:** 1. Students will need some familiarity with diagrams of both processes and how they are interrelated.
Prefix / Suffix	**Sample FOCUS Question**	**Sample FOCUS Question**
Lip- fat *Per- through* *Trans- across* *Port- gate* *Gradus- steps* *Iso- same* *Hyper- above* *Hypo- below* *-osis- process* *a- not/no* *aer- air* *bio- life* *photo- light* *synth- create*	Which of the following statements best describes the function of the lipid bilayer in the cell membrane? 1. Lipids attract water on both sides of the bilayer. 2. Lipid-soluble material cannot pass through a lipid bilayer. 3. Proteins can only transport uncharged particles through the lipid bilayer. 4. Proteins distributed along the bilayer can allow water to pass through the membrane.	Which statement best describes the way that an adenosine diphosphate (ADP) molecule becomes an adenosine triphosphate (ATP) molecule in the human body? 1. Protein causes phosphate molecules to bind to sugars and form ATP. 2. Food energy is used to attach a phosphate molecule to an ADP molecule. 3. Ionized oxygen in cells causes sugars and phosphate molecules to form ATP. 4. Water breaks down ADP molecules which form into ATP molecules over time.

Body of Knowledge: Cell Reproduction, Genetics, and Evolution		January 7 – January 18	
Measurement Topics	**Learning Targets and Skills**	**Benchmarks**	**Academic Language**
Week 19-20 **DNA & Protein Synthesis** **(T14)** **Theories, Laws, & Models** **(T03)**	Students will: • **(T14) explain** why the genetic code is universal and is common to almost all organisms • **(T14) explain** how similarities in the genetic codes of organisms are due to common ancestry and the process of inheritance	**SC.912.L.16.9**	DNA Genetic code Nucleotide Double helix Base pairing rules RNA Messenger RNA Ribosomal RNA Transfer RNA Replication Transcription Translation Codon Anticodon Phenotype Genotype Mutation Gamete Genes Chromosomes Gene expression
	Students will: • **(T14) describe** the basic process of DNA replication and how it relates to the transmission and conservation of the genetic material • **(T03) demonstrate the process** of DNA replication given a DNA strand	**SC.912.L.16.3**	
	Students will: • **(T14) describe causes and effects** of gene and chromosomal mutations in the DNA sequence • **(T14) explain** how mutations in the DNA sequence may or may not result in phenotypic change • **(T14) explain** how mutations in gametes may result in phenotypic changes in offspring	**SC.912.L.16.4**	
	Students will: • **(T14) explain** the basic processes of transcription and translation, and how they result in the expression of genes • **(T03) demonstrates the process** of transcription given a DNA template • **(T03) demonstrates the process** of translation given an mRNA message segment and a codon table	**SC.912.L.16.5**	

Resources	DNA and Protein Synthesis (Week 19-20)	Teacher Notes
Text book	Sections 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7	
Lab Binder	Unit 3, pp.29-40	
Safari Montage		
Websites	DNA Sequence & Assembly, Structure of DNA	
Keeley Probes	Volume 1L #21 (DNA)	
Teacher Hints	**EOC Hints:** 1. Items requiring analysis of base pairs for gene mutations are limited to changes in a single gene. 2. Items will not require memorization of specific conditions resulting from a chromosomal mutation. 3. Items addressing transcription and translation will not require specific knowledge of initiation, elongation and termination. 4. Scenarios requiring the use of a codon table will include it in the item.	

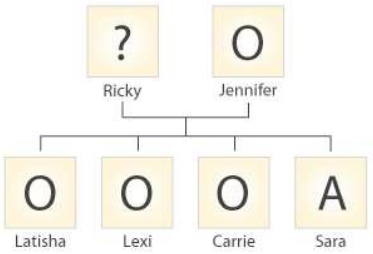
Prefix / Suffix	Sample FOCUS Question	Teacher Notes
Heli- spiral *Script- to write* *Pheno- to be evident* *Gene- beginning* *Chromo- color* *Somos- body* *Ex- out*	Which of the following statements describes processes that occur during DNA replication? 1. A DNA sequence is read by RNA polymerase, which produces another RNA strand complementary to the first strand. 2. Two free-floating single strands of DNA are joined by polymerase. The polymerase finds the point at which the two strands will match up into a double strand. 3. Messenger RNA are decoded by a ribosome to produce an amino acid chain. In the cell's cytoplasm, transfer RNA join the messenger RNA, forming a polypeptide. 4. A double-stranded DNA molecule is unwound into single strands. Polymerase matches the right nucleotides to the single strand so that each forms a double strand of DNA.	

Body of Knowledge: Cell Reproduction, Genetics, and Evolution		January 22 – February 8	
Measurement Topics	**Learning Targets and Skills**	**Benchmarks**	**Academic Language**
Week 21-23 **(14 Days)** **Cell Cycle, Mitosis, & Meiosis** **(T15)** **Theories, Laws, & Models** **(T03)**	Students will: • **(T15) describe** the specific events that occur in each of the stages of the cell cycle which include the phases of mitosis: ○ *interphase* ○ *prophase* ○ *metaphase* ○ *anaphase* ○ *telophase* ○ *cytokinesis* • **(T15) explain** the role of mitosis in the formation of new cells and its importance in maintaining chromosome number during asexual reproduction	**SC.912.L.16.14**	Cell cycle Binary fission Somatic cell Diploid Crossing over Reduction division Haploid Cancer
	Students will: • **(T15) explain** how uncontrolled cell growth (*cancer*) may result from mutations that affect the proteins that regulate the cell cycle	**SC.912.L.16.8**	
	Students will: • **(T15) describe** the process of meiosis, including independent assortment and crossing over • **(T15) explain** how reduction division results in the formation of haploid gametes or spores	**SC.912.L.16.16**	Genetic variation Spore Homologous chromosome Autosome Sex chromosome Sperm Egg Polar body
	Students will: • **(T15) compare and contrast** the processes of mitosis and meiosis • **(T03) model or diagram** the process of mitosis and meiosis • **(T15) explain** how sexual and asexual reproduction may contribute or limit genetic variation	**SC.912.L.16.17**	

Resources	Cell Cycle, Mitosis, & Meiosis (Week 21-23)	Teacher Notes
Text book	Sections 5.1, 5.2, 5.3, 5.4, 6.1, 6.2, 6.6	
Lab Binder	Unit 2, pp.29-39, Unit 3, pp. 1-14	
Safari Montage		
Websites	Tissue Regeneration	
Keeley Probes	Volume 1 - #20 (Functions of Living Things) Volume 3 #16 (Sam's Pup)	
Teacher Hints	**EOC Hints:** 1. Items will focus on the relationship between mutations and uncontrolled cell growth rather than a specific mutation that may result in uncontrolled cell growth. 2. Items may address the presence and location of centrioles but may not require knowledge of the function of centrioles. 3. Items referring to mutation will focus on the general concepts of uncontrolled cell growth and not require specific knowledge of cancers or diseases resulting from that growth. 4. Items will not assess specific proteins associated with regulating the cell cycle.	

Prefix / Suffix	Sample FOCUS Question	Teacher Notes
Bi/bin- two *Somos- body* *di- two* *ply- fold* *-oid- "-like"* *Haplos- single* *Homo- same* *Auto- self* *Logos- reasoning*	Mitosis and meiosis are processes that occur in an organism during reproduction. Which of the following is a result of mitosis? 1. two identical daughter cells 2. four haploid cells that have genetic variation 3. uncontrolled cell division in the form of cancer cells 4. a single diploid cell that is genetically identical to the parent cell	

Body of Knowledge: Cell Reproduction, Genetics, and Evolution		February 11 – March 8	
Measurement Topics	**Learning Targets and Skills**	**Benchmarks**	**Academic Language**
Week 24-26 **(14 days)** **Genetics** **(T16)**	Students will: • **(T16) identify, analyze, and or predict** inheritance patterns caused by various modes of inheritance, including: (*dominant, incomplete dominance, recessive, co-dominant, sex-linked, polygenic, and multiple alleles)* • **(T16) use** a dihybrid and monohybrid cross to **predict and assess** P_1 and F_1generations • **(T16) create and analyze** Punnett squares **to predict** genotypes and phenotypes	**SC.912.L.16.2**	Genetics Gene Allele Homozygous Heterozygous Dominant Recessive Punnett Square Probability Incomplete dominance Codominance Polygenic inheritance Sex-Linked Monohybrid cross Dihybrid cross Law of Independent Assortment Law of Segregation
	Students will: • **(T16) use** Mendel's Laws of segregation and independent assortment to analyze patterns of inheritance	**SC.912.L.16.1**	
Week 26 **(3 days)** **Biotechnology** **(T17)**	Students will: • **(T16) evaluate** the possible impact of biotechnology on the individual, society, and the environment, including medical and ethical issues *(such as: karyotype, cloning, gene therapy, DNA fingerprinting, etc.)*	**SC.912.L.16.10**	Biotechnology Cloning Gene therapy DNA fingerprinting Karyotype
Week 27 **RARE**	1. Review and Catch-up 2. Administer DIA:B 3. Go over test with students, question by question, with meaningful feedback 4. Re-teach and Enrich		

Resources	Genetics (Week 24-26)	Biotechnology (Week 26)
Text book	Sections 6.3, 6.4, 6.5, 7.1, 7.2, 7.3, 7.4, 9.1, 9.2, 9.3, 9.4. 9.5, 9.6	
Lab Binder	Unit 3, pp. 1-14, Unit 3, pp.15-27, Unit 3, pp.41-49	
Safari Montage		
Websites	Gene Expression, Sex-Determination, Transgenic Fly Virtual lab	Stem Cell Therapy, RNA Interference
Keeley Probes	Volume 2 #17 (Baby Mice) Volume 1L #22 (Eye Color)	
Teacher Hints	**EOC Hints:** 1. Scenarios may refer to codominance or incomplete dominance but not together. 2. Items may express inheritance outcomes in percents, ratios or fractions. **Instruction Hints:** 1. Students should be very familiar with using Punnett squares to make predictions of offspring and/or parents.	**EOC Hints:** 1. Items may assess current issues but will not require knowledge of specific biotechnologies or specific medical issues. 2. Items assess the possible impacts of biotechnology will not assess monetary impacts.
Prefix / Suffix	**Sample FOCUS Question**	**Sample Focus Question**
Allos- another -zygous- yold/egg Poly- many Mono- one di- two bio- life karyon- kernel	There are three alleles for blood type: A, B and O. Types A and B are co-dominant, and O is recessive. Based on phenotypes in the pedigree chart below, what is the genotype of the father, Ricky?  1. AA 2. AO 3. AB 4. OO	

Body of Knowledge: Cell Reproduction, Genetics, and Evolution		March 12 – April 12	
Measurement Topics	**Learning Targets and Skills**	**Benchmarks**	**Academic Language**
Week 28-29 **(9 Days)** **The Origin of Life & Cell Theory** **(T10)** **Evidence of Evolution** **(T18)** **Theories, Laws, & Models** **(T03)**	Students will: • **(T10) describe** the scientific explanation of the origin of life on Earth • **(T10) describe** conditions contributing to the origin of life on Earth	**SC.912.L.15.8**	Endosymbiotic Theory
	Students will: • **(T17) explain** how the scientific theory of evolution is supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observed evolutionary change • **(T03) distinguish** between a theory and a law	**SC.912.L.15.1** **SC.912.N.2.1** **SC.912.N.3.1**	Evolution Fossil Homologous structure Vestigial structure Analogous structure Embryology Biogeography
	Students will: • **(T17) 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 • **(T17) identify on a diagram** the four lobes of the brain: (*frontal, parietal, occipital, and temporal)*	**SC.912.L.15.10** **SC.912.L.14.26**	Hominid Temporal Parietal Occipital Frontal
Week 30-31 **Mechanisms of Change** **(T19)**	Students will: • **(T18) discuss** mechanisms of evolutionary change other than natural selection such as genetic drift and gene flow	**SC.912.L.15.14**	Natural selection Frequency Genetic recombination Gene flow Genetic drift Speciation non-random mating Behavioral isolation Geographic isolation Variation Adaptation
	Students will: • **(T18) describe** how mutation and genetic recombination increase genetic variation	**SC.912.L.15.15**	
	Students will: • **(T18) describe** the conditions required for natural selection which result in differential reproductive success including*:* ○ overproduction of offspring ○ inherited variation ○ the struggle to survive	**SC.912.L.15.13**	

Resources	Evidence of Evolution (Week 28-29)	Mechanisms of Change (Week 30-31)
Text book	Sections 10.4, 10.5, 12.6, 29.4	Sections 11.1, 11.2, 11.3, 11.4, 11.5, 11.6
Lab Binder	Unit 4, pp.1-15, pp.31-46	Unit 4, pp.17-30
Book/Video	**EVO: Ten Questions Everyone Should Ask about Evolution**	
Websites	Evolution Videos, Primate Evolution, Fossil Evidence	Human Adaptations, Natural Selection: Lactose, Favorable Genes
Keeley Probes	Volume 4 #13 (Biological Evolution)	Volume 2 #19 (Habitat Change) Volume 4 #16 (Is it Fitter?)
Teacher Hints	**EOC Hints:** 1. Items may assess how contributions of scientists such as Pasteur, Oparin, Miller and Urey, Margulis or Fox aided in the development of the scientific explanation of the origin of life but will not assess what each scientist contributed. 2. Items may assess how the overall contributions of scientists such as Darwin, Lamarck, Lyell, Malthus, Mendel, or Wallace aided in the development of the scientific theory of evolution. 3. Items will NOT assess the differences among intelligent design, creationism and the scientific theory of evolution and should not be taught. 4. Items will address why the Theory of Evolution is a theory and how it was developed. 5. Items referring to comparative anatomy and comparative embryology will assess anatomical similarities such as homologous structures and vestigial organs but will not require specific knowledge of embryologic stages or structures.	**EOC Hints:** 1. Items will not assess the Hardy-Weinberg principle or genetic equilibrium. **Instruction Hints:** 1. Students will need to know the parts of the brain and the four lobes listed in the learning targets but will not have to know their functions.
Prefix / Suffix	**Sample FOCUS Question**	**Sample FOCUS Question**
Endo- internal *Syn- together* *Bio- life* *Vestig- trace of* *Ana- ratio* *Ob(oc)- behind* *Caput- head* *Paries- wall* *Apt- fittest*	Many whales have tiny, unused hip and pelvis bones on their torsos. How does this evidence support theories about animal evolution? 1. It shows that many animals, including whales, evolved to have unused body parts. 2. It shows that whales may have evolved from land-dwelling animals. 3. It shows that whales evolved at the same time as other non-marine animals. 4. It shows that marine animals, like whales, evolved much more slowly than land-dwelling animals.	In which of the following scenarios will natural selection most likely occur? 1. Very little genetic variation is present within the species. 2. Harsh environmental conditions result in competition for survival. 3. No reproductive isolation barriers exist within a species living in an area. 4. A geographical area has plenty of food to support all individuals within the species living in that area.

Body of Knowledge: Human Health		April 15 – April 26	
Measurement Topics	**Learning Targets and Skills**	**Benchmarks**	**Academic Language**

Week 32
 	
Growth & Fetal Development
(T20)
	Students will:
	• **(T19) identify on a diagram and describe** the basic female human reproductive system anatomy and physiology including:
	  ○ *ovaries, oviduct (fallopian tube), uterus, cervix, and vagina*
	• **(T19) identify on a diagram and describe** the basic male anatomy and physiology of the human reproductive system including:
	  ○ *seminal vesicle, prostate gland, vas deferens, urethra, epididymis, scrotum, penis and testes*
	• **(T19) explain** the functions of the placenta, umbilical cord, amniotic sac, amniotic fluid are limited to how these structures relate to the development of the fetus
	• **(T19) use a diagram** to show where each process of the human development occurs from the zygotic stage to the end of the third trimester
		SC.912.L.16.13	Zygote
			Blastocyst
			Implantation
			Embryo
			Fetus
			Amniotic sac
			Placenta
			Umbilical cord
			Trimester
			Fertilization

Week 33 **Human Health** **(T21)**	Students will: • **(T20) describe** the factors affecting blood flow in the cardiovascular system: ○ *blood pressure, blood volume, resistance, disease and exercise*	**SC.912.L.14.36**	Cardiovascular system Blood pressure Blood volume Flow resistance Viscosity Immune system Specific / Nonspecific immune response Active immunity Passive immunity Vaccine Antibiotic resistance Communicable disease Chronic disease
	Students will: • **(T20) explain** the basic functions of the human immune system, including specific and nonspecific immune response, vaccines, and antibiotics	**SC.912.L.14.52**	

	Students will:
	• **(T20) explain** how both individual and public health are impacted by:
	  ○ genetic factors
	  ○ environmental factors
	  ○ pathogenic agents
	• **(T20) analyze** how heredity/family history can impact personal health
	• **(T20) analyze** strategies for prevention, detection, and treatment of communicable and chronic diseases
		SC.912.L.14.6	

Resources	Human Growth and Fetal Development (Week 32)	Human Health (Week 33)
Text book	Sections 34.2, 34.3, 34.4	Sections 30.1, 30.2, 30.3, 30.4, 31.1, 31.2, 31.3, 31.4, 31.5, 31.6
Lab Binder	Unit 9, pp.37-48	Unit 9, pp.1-12, Unit 9, pp.13-24, Unit 9, pp.25-36
Safari Montage		
Websites Keeley Probes		Mosquito-Borne Diseases, Cells of the Immune System Measuring Obesity, Virtual Museum: Cardiovascular Disease, Cardiology Virtual Lab, Immunology Virtual Lab
Teacher Hints	**EOC Hints:** 1. Items will not assess specific knowledge of malformations in the human fetus, miscarriages, maternal pre-existing conditions, genetic conditions or the impact of the environment for this benchmark. 2. Items will not assess the utilization of technology to assist in or prevent fertilization or to monitor the development of the fetus. 3. Items will not address the menstrual cycle or specific hormones. 4. Items will may use diagrams of male or female reproductive anatomy and ask questions about structure and function or stages occurring in certain places. **Instruction Hints:** 1. This is the first time this information has been presented in school 2. Students have to know the process of human development from fertilization to the end of the third trimester and birth (page 801) 3. fertilization (fallopian tubes) → zygote forms→morula (fallopian tube toward uterus)→blastocyst (uterine lining) →implantation (uterus)→gastrulation & neurulation (uterus)	**Instruction Hints:** 1. You will **not** have time to cover all of the human body and the benchmarks do not require you to do so. 2. Please stay focused on the learning targets. You will **not** have time to extend your scope. 3. This is **not** a unit on Body systems it focuses on human health.
Prefix / Suffix	**Sample FOCUS Question**	**Sample FOCUS Question**
Zygos- egg/yolk *Blast- sprout* *-cyst- pouch* *Cardio- heart* *Anti- against* *Biotic- life* *Chronos- time*	Which of the following sequences correctly describes prenatal development? 1. blastocyst implants in uterus, zygote forms, heart begins beating, lungs can breathe air, sex organs become visible 2. blastocyst implants in the uterus, zygote forms, heart begins beating, sex organs become visible, lungs can breathe air 3. zygote forms, blastocyst implants in the uterus, heart begins beating, sex organs become visible, lungs can breathe air 4. zygote forms, blastocyst implants in the uterus, sex organs become visible, heart begins beating, lungs can breathe air	Which of the following would be the best way to determine whether or not an individual has a viral infection? 1. Look for evidence of a high-grade fever. 2. Look for the presence of redness and swelling. 3. Look for evidence of specific antibodies in the blood. 4. Look for the presence of white blood cells in the blood.

<table>
<tr><td colspan="2">Body of Knowledge: Human Impact and Biotechnology</td><td colspan="2">April 29 – May 17</td></tr>
<tr><td>Measurement Topics</td><td>Learning Targets and Skills</td><td>Benchmarks</td><td>Academic Language</td></tr>
<tr><td rowspan="2">Week 34

Human Impact
(T07)</td><td>Students will:
• (T03) identify ways in which a scientific claim is evaluated (e.g., through scientific argumentation, critical and logical thinking, and/or consideration of alternative explanations)
• (T03) evaluate scientific claims focused on the impacts on the environment and renewable and nonrenewable resources</td><td>SC.912.N.1.3</td><td rowspan="2">Scientific claim
Renewable resources
Non-renewable resources
Pollution
Smog
Acid rain
Greenhouse effect
Global warming
Fossil fuels
Indicator species
Biomagnification
Bioaccumulation
Habitat fragmentation
Sustainability</td></tr>
<tr><td>Students will:
• (T07) predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability
• (T07) discuss the need for adequate monitoring of environmental parameters when making policy decisions
• (T07) evaluate the possible environmental costs and benefits resulting from the use of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests</td><td>SC.912.L.17.11
SC.912.L.17.13
SC.912.L.17.20</td></tr>
<tr><td>Week 35</td><td colspan="3">Biology EOC</td></tr>
<tr><td>Week 36
RARE</td><td colspan="3">1. Review and Catch-up
2. Administer DIA:B
3. Go over test with students, question by question, with meaningful feedback
4. Re-teach and Enrich</td></tr>
</table>

<table>
<tr><th colspan="2">Body of Knowledge: Bridge to Chemistry</th><th colspan="2">May 20 – June 4</th></tr>
<tr><th>Measurement Topics</th><th>Learning Targets and Skills</th><th>Benchmarks</th><th>Academic Language</th></tr>
<tr><td rowspan="3">Week 37-39

Bridge to Chemistry

resources coming soon</td><td>Students will:
measure and collect data (in metric units) using tools such as:
mass (g): triple beam or digital balance
length (cm): meter stick, metric ruler
volume (L): cylinder, pipettes, beaker
temperature (°c): thermometer</td><td>SC.912.N.1.1</td><td rowspan="3">Atom
Molecule
Compound
Element
Homogeneous
Heterogeneous
Solid
Liquid
Gas
Mass
Temperature
Volume
Conservation of Mass
Density
Salinity
pH
Freezing Point
Boiling Point</td></tr>
<tr><td>Students will:
differentiate among atoms, elements, compounds, and molecules
differentiate among pure substances, mixtures, and solutions:
homogenous vs. heterogeneous
saturated vs. unsaturated
identify the different states of matter in a mixture
(gas in liquid -> soda)
(gas in gas -> air)
(solid in solid -> alloy)
interpret chemical formulas and equations
explain the conservation of mass in terms of chemical equations using biological examples</td><td>SC.912.P.8.1
SC.912.P.8.3
SC.912.P.8.7
SC.912.P.8.9</td></tr>
<tr><td>Students will:
investigate various properties of matter and mixtures, e.g.:
Density (g/cm^3)
Salinity
pH
freezing point (°c)
boiling point (°c)
analyze and interpret collected data using graphs, tables, and charts</td><td>SC.912.P.8.2
SC.912.P.8.11</td></tr>
<tr><td>Week 38-39
FINALS</td><td colspan="3"></td></tr>
</table>