

**MIAMI-DADE COUNTY PUBLIC SCHOOLS
District Pacing Guide**

BIOLOGY I

Course Code: 200031001

BODY OF KNOWLEDGE: P: Physical Science – L: Life Science – LA: Language Arts

TOPIC IV: Ecosystems and Energy Flow

	Pacing	Date(s)
Traditional	8 days	09-24-10 to 10-05-10
Block	4 days	09-24-10 to 10-05-10

NEXT GENERATION SUNSHINE STATE STANDARDS (FIELD TESTED 2011)	ESSENTIAL CONTENT	OBJECTIVES	INSTRUCTIONAL TOOLS
<p>Standard 10: Energy SC.912.P.10.1 SC.912.P.10.2 SC.912.P.10.8</p> <p>Standard 17: Interdependence SC.912.L.17.4 SC.912.L.17.5 SC.912.L.17.6 SC.912.L.17.7 SC.912.L.17.8 SC.912.L.17.9 SC.912.L.17.16 SC.912.L.17.20</p> <p>Standard 2: Nonfiction LA.910.2.2.3</p>	<p>A. Conservation of Matter and Energy 1. Matter & Energy (1st Law) 2. Energy is transferred to a less useful form, such as heat</p> <p>B. Food Chains and Food Webs 1. Energy usage and Transfer 2. Types of organisms (Producers, Consumers, and Decomposers) 3. Biomagnification</p> <p>C. Types of Pyramids (Energy, Biomass, and Numbers)</p> <p>D. Organism Interactions 1. Predator/Prey 2. Symbiosis (Mutualism, Parasitism, and Commensalism) 3. Coevolution</p>	<ul style="list-style-type: none"> Describe how the interdependence of organisms in an ecosystem results in a relatively stable system that cycle around a state of equilibrium. Construct and compare food chains and food webs. Describe environmental; problem such as; pollution, biological magnification of toxic substances facing South Florida, and generate possible solutions. Identify current problems caused by applied technology and economic pressures that might be solved by the application of biological knowledge, e.g. pesticides in the environment, genetic engineering, management of public lands and resources, and deforestation. Explain the ecological interactions demonstrated by symbiosis (mutualism, commensalisms, parasitism, competition, and predation). Distinguish between pyramids of energy, biomass, and numbers. 	<p>Core Text Book: Chapters 3, 4, 5, and 6</p> <p>Vocabulary: (see p.4) Biological Magnification, Biodiversity, Exponential growth curve, Logistic growth curve,</p> <p>Technology: (see p.4) 1. GIZMOS 2. <i>Analyze Population Growth Data OA</i></p> <p>Strategies: (see p.4) o ELL: o Enrichment: o SPED:</p> <p>Assessment: (see p.4) 1. Formal and authentic 2. Lab reports</p> <p>Labs: (see p.4) 1. <i>Designing Food Chains and Food Web Lab AP</i> 2. <i>Owl Pellet Dissection (Design Food Chains and Food Web)</i> 3. <i>What relationship exist in an ecosystem? TX p.86</i> 4. <i>How do abiotic factors affect different plant species? TX p.91</i> 5. <i>How does biological magnification occur? TX p.153</i></p> <p>Related Program: NA</p>

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NEXT GENERATION SUNSHINE STATE STANDARDS

PHYSICAL SCIENCE BODY OF KNOWLEDGE

STANDARD 10: Energy

- A. Energy is involved in all physical and chemical processes. It is conserved, and can be transformed from one form to another and into work. At the atomic and nuclear levels energy is not continuous but exists in discrete amounts. Energy and mass are related through Einstein's equation $E=mc^2$.
- B. The properties of atomic nuclei are responsible for energy-related phenomena such as radioactivity, fission and fusion.
- C. Changes in entropy and energy that accompany chemical reactions influence reaction paths. Chemical reactions result in the release or absorption of energy.
- D. The theory of electromagnetism explains that electricity and magnetism are closely related. Electric charges are the source of electric fields. Moving charges generate magnetic fields.
- E. Waves are the propagation of a disturbance. They transport energy and momentum but do not transport matter.

BENCHMARK CODE	BENCHMARK
SC.912.P.10.1	Differentiate among the various forms of energy and recognize that they can be transformed from one form to others. <i>Cognitive Complexity/Depth of Knowledge Rating: Moderate</i>
SC.912.P.10.2	Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity. <i>Cognitive Complexity/Depth of Knowledge Rating: High</i>
SC.912.P.10.8	Explain entropy's role in determining the efficiency of processes that convert energy to work. <i>Cognitive Complexity/Depth of Knowledge Rating: High</i>

LIFE SCIENCE BODY OF KNOWLEDGE

STANDARD 17: Interdependence

- A. The distribution and abundance of organisms is determined by the interactions between organisms, and between organisms and the non-living environment.
- B. Energy and nutrients move within and between biotic and abiotic components of ecosystems via physical, chemical and biological processes.
- C. Human activities and natural events can have profound effects on populations, biodiversity and ecosystem processes.

BENCHMARK CODE	BENCHMARK
SC.912.L.17.4	Describe changes in ecosystems resulting from seasonal variations, climate change and succession. <i>Cognitive Complexity/Depth of Knowledge Rating: Moderate</i>
SC.912.L.17.5	Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity. <i>Cognitive Complexity/Depth of Knowledge Rating: High</i>
SC.912.L.17.6	Compare and contrast the relationships among organisms, including predation, parasitism, competition, commensalism, and mutualism. <i>Cognitive Complexity/Depth of Knowledge Rating: Moderate</i>

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SC.912.L.17.7	Characterize the biotic and abiotic components that define freshwater systems, marine systems and terrestrial systems. <i>Cognitive Complexity/Depth of Knowledge Rating: Moderate</i>
SC.912.L.17.8	Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species. <i>Cognitive Complexity/Depth of Knowledge Rating: High</i>
SC.912.L.17.9	Use a food web to identify and distinguish producers, consumers, and decomposers. Explain the pathway of energy transfer through trophic levels and the reduction of available energy at successive trophic levels. <i>Cognitive Complexity/Depth of Knowledge Rating: Moderate</i>
SC.912.L.17.16	Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution. <i>Cognitive Complexity/Depth of Knowledge Rating: High</i>
SC.912.L.17.20	Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability. <i>Cognitive Complexity/Depth of Knowledge Rating: High</i>

LANGUAGE ARTS: LITERARY ANALYSIS STRAND

Standard 2: Nonfiction	
The student identifies, analyzes, and applies knowledge of the elements of a variety of nonfiction, informational, and expository texts to demonstrate an understanding of the information presented.	
BENCHMARK CODE	BENCHMARK
LA.910.2.2.3	The student will organize information to show understanding or relationships among facts, ideas, and events (e.g., representing key points within text through charting, mapping, paraphrasing, summarizing, comparing, contrasting, or outlining); <i>Cognitive Complexity/Depth of Knowledge Rating: N/A</i>

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TOPIC IV	INSTRUCTIONAL TOOLS
	<p><u>Vocabulary (cont.):</u> Producer, Consumer, Decomposer, Trophic level, Food chain, Herbivore, Carnivore, Omnivore, Consumer (primary, secondary, tertiary), Detritus, Food web, Pyramid (Energy, Biomass, Numbers), Biomass, Primary productivity, Predator-prey relationship, Competition, Predation, Commensalism, Mutualism, Parasitism</p> <p><u>Technology (cont.):</u> 3. <i>Changes in Population Activity</i> Visit PHschool.com Code: cbn-2051 4. <i>Population Growth</i> Visit SciLinks.org Code: cbn-2053 5. Food Chain Game: http://www.sheppardsoftware.com/content/animals/kidscorner/games/foodchaingame.htm</p> <p><u>Strategies (cont.):</u> <i>CRISS</i> - Incorporate strategies which are most appropriate for your students and learning environment, such as: Concept Mapping, Venn Diagrams, KWL, Think Pair Share, Jigsawing, Word Walls, Two-column Notes, Sticky Notes, Think-Tac-Toe, Cooperative Learning, Exit Cards.</p> <p><i>Differentiated Instruction</i> - Implement strategies which are most appropriate for your students and learning environment, such as: Inquiry Based Learning, Performance Based Assessments, Foldable Booklets, Student Portfolios, Concept Bingo</p> <p><i>Lab Strategies</i> - Use the scientific method to analyze the variables in labs and report results in a proper lab write-up format. Assign lab roles to student; Project Director, Materials Manager, Technical Manager, Safety Director. Follow the district's guideline for Power Writing in Science.</p> <p><u>Assessment (cont.):</u> 3. Create a food web with at least four trophic levels, label the organisms as either producer or consumer, identify the trophic levels and given a starting amount determine the amount of energy at each level. 4. Cornell Style Notes (AVID) 5. Class participation</p> <p><u>Labs (cont.):</u> 3. <i>Observing Decomposition LMB</i> p.77 4. <i>How Does Biological Magnification Occur? TX</i> p.153 5. <i>How Does Competition Affect Growth TX</i> p.125</p>

TOPIC IV	GIZMO CORRELATION
BENCHMARK	GIZMO TITLE
SC.912.L.17.9	Food Chain
SC.912.L.17.6	Rabbit Population by Season

**MIAMI-DADE COUNTY PUBLIC SCHOOLS
Instructional Focus Calendar**

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Date	Pacing guide Benchmark(s)	Data Driven Benchmark(s)	Activities	Assessment(s)	Strategies
<p>Traditional: 09-24-10 to 10-05-10</p> <p>Block: 09-24-10 to 10-05-10</p>	<p>Standard 10: Energy SC.912.P.10.1 SC.912.P.10.2 SC.912.P.10.8</p> <p>Standard 17: Interdependence SC.912.L.17.4 SC.912.L.17.5 SC.912.L.17.6 SC.912.L.17.7 SC.912.L.17.8 SC.912.L.17.9 SC.912.L.17.16 SC.912.L.17.20</p> <p>Standard 2: Nonfiction LA.910.2.2.3</p>				