

Thomas Edison Energy Smart Charter School
Science Unit Plan
Life Science: Grade 5 – Environments

Unit Title:	Time Frame:	21 st Century Theme:
Environments	3 rd Marking Period	9.1 - Critical Thinking & Problem Solving Communication and Media Fluency Creativity and Innovation
Standard:		
<ul style="list-style-type: none"> ● 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics. ● 5.4 Earth Systems Science: All students will understand that Earth operates as a set of complex, dynamic, and interconnected systems, and is a part of the all-encompassing system of the universe. 		
Strands:	Cumulative Progress Indicator Number(s):	
<ul style="list-style-type: none"> ● B. Matter and Energy Transformations: <i>Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.</i> ● C. Interdependence: <i>All animals and most plants depend on both other organisms and their environment to meet their basic needs.</i> ● G. Biogeochemical Cycles: <i>The biogeochemical cycles in the Earth systems include the flow of microscopic and macroscopic resources from one reservoir in the hydrosphere, geosphere, atmosphere, or biosphere to another, are driven by Earth's internal and external sources of energy, and are impacted by human activity.</i> 	<ul style="list-style-type: none"> ● 5.3.6.B.1 - Describe the sources of the reactants of photosynthesis and trace the pathway to the products. ● 5.3.6.B.2 - Illustrate the flow of energy (food) through a community. ● 5.3.8.B.2 - Analyze the components of a consumer's diet and trace them back to plants and plant products. ● 5.3.6.C.1 - Explain the impact of meeting human needs and wants on local and global environments. ● 5.3.6.C.2 - Predict the impact that altering biotic and abiotic factors has on an ecosystem. ● 5.3.6.C.3 - Describe how one population of organisms may affect other plants and/or animals in an ecosystem. ● 5.4.6.G.2 - Create a model of ecosystems in two different locations, and compare and contrast the living and nonliving components. ● 5.4.6.G.3 - Describe ways that humans can improve the health of ecosystems around the world. 	

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Objectives:	
<ul style="list-style-type: none">●● Show the flow of energy through an ecosystem● Explain how the sun’s energy is used in photosynthesis● Understand the Law of Conservation of Energy● An ecosystem includes all of the plant and animal populations and nonliving resources in a given area. Organisms interact with each other and with other components of an ecosystem● Personal activities impact the local and global environment.	
Essential Question:	Enduring Understanding:
<ul style="list-style-type: none">● What can happen to animals and plants when the environment changes?● How the ranges of tolerance for environmental factors differ in different organisms?● How do we know that an environment changes?● What do all living things have in common?● How do changes in one part of the Earth system affect other parts of the system and in what ways can Earth processes be explained as interactions among spheres?● How do humans impact the diversity and stability of ecosystems?● How can people help restore damaged Ecosystems?	<ul style="list-style-type: none">● Ecosystems comprised of biotic and abiotic factors, change over time.● Human activity influences ecosystems.● Living organisms have a variety of observable features that enable them to obtain food and reproduce.● Earth’s components form systems that have cycles and patterns that allow us to make predictions. These systems continually interact at different rates of time, affecting the Earth locally and globally.

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Unit Learning Targets: <i>The student will be able to....</i>	Suggested Activities: <i>Including Differentiated Strategies (DI)</i>	Vocabulary:
<ul style="list-style-type: none"> ● Determine an organism’s optimum condition and environmental preferences. ● Relate the behavior of an animal to its environmental factors. ● Observe and identify factors that make up aquatic environments. ● Evaluate the affect of living organisms in an environment. ● Design and Investigate to test the range of salt tolerance for brine shrimp hatching. ● Determine the range of salt tolerance on plants. ● Recognize that plants are producers: They use the energy from light to make food (sugar) from carbon dioxide and water. NJCCCS ● Explain how plants are used as a source of food (energy) for other organisms. NJCCCS ● Understand that all animals, including humans, are consumers that meet their energy needs by eating other organisms or their products. NJCCCS ● Understand that all animals, including humans, are consumers that meet their energy needs by eating other organisms or their products. NJCCCS 	<p>CT:FOSS kit, <i>Environments</i> (Investigation1-parts 1-2;Investigation 2-parts 1-3;Investigation 3, parts1-3;Investigation 5,parts 1-3:Investigation 6,parts 1-2)</p> <p>CT: Lab manual Teacher edition, Investigation - <i>Observing effects of fertilizer</i>; Investigation log- <i>Cleaning water</i>(refer Science Resource Guide)</p> <p>US:TLC Elementary School: People and the environment</p> <p>IR: The New York times, Forest Study is first to show Ozone retards growth of Trees</p> <p>US: Animals, Environments and Adaptations</p> <ul style="list-style-type: none"> ● SR: Films, library research on biomes from around the world. ● Owl Pellet Dissection Lab 	<ul style="list-style-type: none"> ● abiotic ● biotic ● carnivore ● consumer ● energy pyramid ● food chain ● food web ● herbivore ● omnivore ● predator ● prey ● producer ● Environment, environmental factor, germinate, terrarium, organisms, adaptations, variable, environmental factor, isopod, preferred environment,

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<ul style="list-style-type: none"> ● Various human activities have changed the capacity of the environment to support some life forms. NJCCCS ● The number of organisms and populations an ecosystem can support depends on the biotic resources available and on abiotic factors, such as quantities of light and water, range of temperatures, and soil composition. NJCCCS ● All organisms cause changes in the ecosystem in which they live. If this change reduces another organism’s access to resources, that organism may move to another location or die. NJCCCS 	<ul style="list-style-type: none"> ● Construct 3D Energy Pyramid ● Illustrate 10% Rule for energy transfer ● Construct a digital simulation to explain how energy entering the ecosystem as sunlight is transferred by producers into chemical energy through photosynthesis. ● Create a digital interactive food web that traces energy from light through an ecosystem. Highlight each transfer of energy between organisms, and discuss how the pathway may vary within one ecosystem and between ecosystems. 	<p>controlled experiment, optimum, range of tolerance, aquarium, carbon dioxide, indicator, Brine Shrimp, salinity, viable</p>
Resource Materials:		Assessments:
<ul style="list-style-type: none"> ● Harvard-Smithsonian Center for Astrophysics’ Digital Video Library provides short video clips of teachers describing experiments associated with this CPI. http://www.hsdvl.org/video.php?record_serial=231 ● Harvard-Smithsonian Center for Astrophysics’ Digital Video Library provides short video clips of classroom experiences and interviews with students and scientists regarding the content aligned with this CPI. http://www.hsdvl.org/video.php?record_serial=110 ● Harvard-Smithsonian Center for Astrophysics’ Digital Video Library provides short video clips of an interview with a science education expert regarding content associated with this CPI. 		<ul style="list-style-type: none"> ● Journals and portfolios ● Open-ended prompts ● Lab Reports ● Posters ● Projects ● Quizzes/Tests ● Presentations ● Benchmarks

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<p>http://www.hsdvl.org/video.php?record_serial=1005</p> <ul style="list-style-type: none"> • Harvard-Smithsonian Center for Astrophysics' Digital Video Library provides short video clips of an interview with a science education expert regarding student misconceptions associated with this CPI. <p>http://www.hsdvl.org/video.php?record_serial=43</p> <ul style="list-style-type: none"> • Teachers' Domain provides lesson plans and other multimedia resources (video clips and simulations) that support this CPI. <p>http://www.teachersdomain.org/resource/tdc02.sci.life.oate.decompose/</p>	
<p>Technology Integration:</p>	<p>Related Literature:</p>
<ul style="list-style-type: none"> • Computer • Smart Board • Ipads 	<p>LC:FOSS science Stories</p> <p>IR: The New York times, Forest Study is first to show Ozone retards growth of Trees</p>