



Saddlebrook Preparatory School

**Curriculum Map- Scope and Sequence:
High School Environmental Science**

Purpose of Planning	Unit One Intro. to Env. Sci. Q1, W1-3	Unit Two Ecology Q1, W4-9	Unit Three Populations Q2, W10-15	Unit Four Water, Air, and Land Q2-Q3, W16-25	Unit Five Mineral & Energy Resources Q3-Q4, W26-32
Unit Topic and Overview:	The study of environmental science involves multiple science disciplines (biology, chemistry, physical) and the implementation of scientific thinking to solve problems experienced in nature.	The study of ecology relates the biotic and abiotic factors within an ecosystem, and how natural processes and humankind impact biomes.	The study of populations examines the reproductive and survival success of species within their environments.	The study of water, air, and land connects the various processes of Earth to the abiotic and biotic systems they affect.	The study of resources, energies, and waste constantly create a give-and-take balance on our planet and within ecosystems.
Prerequisite Student Knowledge *What should students have previously mastered prior to this unit?	Students should have background knowledge of and completed core science classes in biology, physical science and possibly chemistry.	Students should know biotic and abiotic factors, food chains and webs, and major biomes of Earth.	Students should have background knowledge of food chains/webs, predator-prey relationships, and population dynamics from previous biology courses.	Students should have background knowledge of Earth's resources and the connectivity of various elemental cycles.	Students should have background knowledge of renewable and non-renewable resources, and the impacts of waste on our planet.



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<p>Essential Knowledge & Student Expectations *What are the anticipated learning outcomes for students?</p>	<p>Students will demonstrate knowledge of scientific thinking and a review of core science courses (which will carry throughout the rest of the course.)</p> <p>Essential Questions: 1. Connect the themes of multiple science disciplines to topics in this course. 2. Generate a hypothesis to test an inference you have observed. Summarize your experimental findings.</p>	<p>Students will demonstrate knowledge of ecology with hands-on labs and create a biome gallery as a class.</p> <p>Essential Questions: 1. Create a food chain for a tertiary predator, and then construct the food web based on that organism's biome. Explain possible threats (natural or manmade) of your chosen organism. 2. Invent a biome gallery relating abiotic and biotic organisms.</p>	<p>Students will demonstrate knowledge of populations and biodiversity with connectedness of trends in labs and design a wildlife preserve in groups.</p> <p>Essential Questions: 1. Explain the trends within a population that contribute to successful survival of that species. 2. Create a wildlife preserve to connect the ecology, population dynamics, and protection of abiotic or biotic factors of various biomes.</p>	<p>Students will demonstrate knowledge of the value of water, air, and land resources on Earth as these resources relate to the product(s)/service(s) they provide.</p> <p>Essential Questions: 1. Explain if any foods produced in agriculture are truly organic/natural as current marketing strategies claim. Make bold statement for or against GMO foods supported by evidence presented in this unit. 2. Visually and with words, diagram the importance of the overlapping resources of Earth and humans are impacted.</p>	<p>Students will demonstrate knowledge of resources, energies, and waste as they relate on a personal level to their impact and how that adds to the global populations' impact on Earth's resources, energies, and waste production.</p> <p>Essential Questions: 1. Reflect on how personal energy consumption or waste production affects your local, state, and global circles. 2. Create a consumer awareness guide of the conditions people create with excessive energy consumption or excessive waste generation.</p>
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<p style="text-align: center;">Anchor Text and Supplemental Texts</p> <p>*Illustrate texts used, and how students' knowledge builds across units.</p>	<p>Anchor Texts: Heithaus, M. and Arms, K. <u>Environmental Science</u>. Orlando, Florida. Holt McDougal, 2013 Ch 1 Science and the Environment (pg 4-28) Ch 2 Tools of Environmental Science (pg 30-56) Ch 3 The Dynamic Earth (pg 58-88)</p> <p>Literary Texts:</p> <p>Informational Texts: From Library- will vary with student project topics Case Study -pg 12 Dam Removal -pg 46 Saving the Everglades -pg 74 Storm Surges</p>	<p>Anchor Texts: Heithaus, M. and Arms, K. <u>Environmental Science</u>. Orlando, Florida. Holt McDougal, 2013 Ch 4 The Organization of Life (pg 92-114) Ch 5 How Ecosystems Work (pg 116-140) Ch 6 Biomes (pg 142-170) Ch7 Aquatic Ecosystems (pg 172-192)</p> <p>Literary Texts:</p> <p>Informational Texts: Case Study -pg 98 Darwin's Finches -pg 120 DDT -pg 130 Communities/Fire -pg 150 Deforestation -pg 180 Restoration/Bay</p>	<p>Anchor Texts: Heithaus, M. and Arms, K. <u>Environmental Science</u>. Orlando, Florida. Holt McDougal, 2013 Ch 8 Understanding Populations (pg 196-216) Ch 9 The Human Population (pg 218-238) Ch 10 Biodiversity (pg 240-264)</p> <p>Literary Texts:</p> <p>Informational Texts: Case Study -pg 206 Predator-Prey Adaptations -pg 228 Thailand's Population Challenges -pg 248 Genetic Gold Rush in Rainforests</p>	<p>Anchor Texts: Heithaus, M. and Arms, K. <u>Environmental Science</u>. Orlando, Florida. Holt McDougal, 2013 CH 11 Water (pg 268-300) Ch 12 Air (pg 302-324) Ch 13 Atmosphere and Climate Change (pg 326-362) Ch14 Land (pg 354-376) Ch 15 Food and Agriculture (pg 378-406)</p> <p>Literary Texts:</p> <p>Informational Texts: Case Study -pg 272 Aquifer -pg 310 Ground-Level Ozone -pg 330 Ice cores -pg 366 Conservation Planning -pg 396 Fish Farms</p>	<p>Anchor Texts: Heithaus, M. and Arms, K. <u>Environmental Science</u>. Orlando, Florida. Holt McDougal, 2013 Ch 16 Mining and Mineral resources (410-432) Ch 17 Nonrenewable Energy (pg 434-454) Ch18 Renewable Energy (pg 456-478) Ch 19 Waste (pg 480-506)</p> <p>Literary Texts:</p> <p>Informational Texts: Case Study -pg418 Mining in California -pg 440 "Gas" Rush -pg 458 Super-efficient Home -pg 490 Paper or Plastic?</p>
<p style="text-align: center;">Multi-Media Links:</p> <p>*Videos, presentations, any and all supplemental online material.</p>	<p>-Discovery Education Video: Faces of Earth: Building the Planet -Discovery Education Video: Faces of Earth: Shaping the Planet</p>	<p>-Discovery Education Video: Emerging Careers: Environmental Occupations: Professional</p>	<p>-Discovery Education Video: Preserving the Legacy: The Delicate Balance: Part 01</p>	<p>-Discovery Education Video: History's Harvest: Where Food Comes From -Discovery Education Video: Discovery Project Earth: Engineering the Future</p>	<p>-Discovery Education Video: Preserving the Legacy: Waste: Part 01 -Discovery Education Video: Preserving the Legacy: Waste: Part 02</p>



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<p>Instructional Practices: * Various Instructional Modalities, including Technology used</p>	<p>-Bell work and discussion of Essential Questions -Lecture with PowerPoint, students take notes on laptops -Focused reading of anchor text and vocabulary -Outlining student driven experiment/project -Scientific research methods on student laptops -Labs: What is an Ecosystem (pg 28), Risk Assessment (pg 56), Critical Thinking in the News (handout), Research Banning (handout/research), Sample Size (handout), Graphing Lab Air Temperature (handout) -Labs reinforce topics with hands-on experiments in the local environment -Case Studies relate articles to topics within the unit</p> <p>*Most handouts, labs, and assignments are done electronically (via word document and submitted via e-mail- to reduce paper consumption within this course.)</p>	<p>-Bell work and discussion of Essential Questions -Lecture with PowerPoint, students take notes on laptops -Focused reading of anchor text and vocabulary -Labs: Identify Your Local Biome (pg 170), Studying Ecosystems (handout), Microclimates (handout), Graphing Tides (handout/research), Modeling Populations (handout), Pond Exploration (handout) -Labs reinforce topics with hands-on experiments in the local environment -Case Studies relate articles to topics within the unit</p> <p>*Most handouts, labs, and assignments are done electronically (via word document and submitted via e-mail- to reduce paper consumption within this course.)</p>	<p>-Bell work and discussion of Essential Questions -Lecture with PowerPoint, students take notes on laptops -Focused reading of anchor text and vocabulary -Labs: Modeling Predation (handout), Survivorship Curves (handout), How Will Our Populations Grow (pg 238), Captive Breeding (handout/research) -Labs reinforce topics with hands-on experiments in the local environment -Case Studies relate articles to topics within the unit</p> <p>*Most handouts, labs, and assignments are done electronically (via word document and submitted via e-mail- to reduce paper consumption within this course.)</p>	<p>-Bell work and discussion of Essential Questions -Lecture with PowerPoint, students take notes on laptops -Focused reading of anchor text and vocabulary -Labs: Oil Spill Clean Up (handout), Sources of water and air pollution (handout), City Air Quality (lab/research), Food Labels (handout/research), Creating a Land-Use Model (pg 376) -Labs reinforce topics with hands-on experiments in the local environment -Case Studies relate articles to topics within the unit</p> <p>*Most handouts, labs, and assignments are done electronically (via word document and submitted via e-mail- to reduce paper consumption within this course.)</p>	<p>-Bell work and discussion of Essential Questions -Lecture with PowerPoint, students take notes on laptops -Focused reading of anchor text and vocabulary -Labs: Classifying Rocks (handout), Your Household Energy Consumption (pg 454), Out of Sight-Out of Mind (pg 506) -Labs reinforce topics with hands-on experiments in the local environment -Case Studies relate articles to topics within the unit</p> <p>*Most handouts, labs, and assignments are done electronically (via word document and submitted via e-mail- to reduce paper consumption within this course.)</p>
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Assessments: *Types and Measurements of Mastery	Informal Assessments: Bell work/Exit slips daily, class lectures/discussions, checking focused reading answers/HW. Formal Assessments: Chapter quiz, unit test, weekly check points for student project, and labs. Objective: 80% of student athletes will be able to demonstrate mastery (mastery is defined as 80%+) on formal assessments at the completion of the unit.	Informal Assessments: Bell work/Exit slips daily, class lectures/discussions, checking focused reading answers/HW. Formal Assessments: Chapter quiz, unit test, and labs. Objective: 80% of student athletes will be able to demonstrate mastery (mastery is defined as 80%+) on formal assessments at the completion of the unit.	Informal Assessments: Bell work/Exit slips daily, class lectures/discussions, checking focused reading answers/HW. Formal Assessments: Chapter quiz, unit test, and labs. * Semester 1 Final Exam Objective: 80% of student athletes will be able to demonstrate mastery (mastery is defined as 80%+) on formal assessments at the completion of the unit.	Informal Assessments: Bell work/Exit slips daily, class lectures/discussions, checking focused reading answers/HW. Formal Assessments: Chapter quiz, unit test, and labs. Objective: 80% of student athletes will be able to demonstrate mastery (mastery is defined as 80%+) on formal assessments at the completion of the unit.	Informal Assessments: Bell work/Exit slips daily, class lectures/discussions, checking focused reading answers/HW. Formal Assessments: Chapter quiz, unit test, and labs. Objective: 80% of student athletes will be able to demonstrate mastery (mastery is defined as 80%+) on formal assessments at the completion of the unit.
Interdisciplinary Lessons & Projects: *State additional content areas and title all lesson(s) and project(s)	-Student driven projects (Science, LA/Writing, Research Skills, Math, Technology)	-Biome gallery (science, LA/Writing, technology, art/humanities)	-Lab designing a wildlife preserve (as a group)	-Environmental product/service (science, technology, engineering, LA/Writing, math, economics, history)	-Energy/Trash Lab (Science, LA/Writing, Math, Economics, Ethics)
Honors Course Differentiation(s):	N/A	N/A	N/A	N/A	N/A



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<p>Integrated Common Core or NGSS Standards (List): *See Below for Links</p>	<p>CCSS.ELA-Literacy.RST.9-10.1 CCSS.ELA-Literacy.RST.9-10.2 CCSS.ELA-Literacy.RST.9-10.3 CCSS.ELA-Literacy.RST.9-10.4 CCSS.ELA-Literacy.RST.9-10.5 CCSS.ELA-Literacy.RST.9-10.6 CCSS.ELA-Literacy.RST.9-10.7 CCSS.ELA-Literacy.RST.9-10.8 CCSS.ELA-Literacy.RST.9-10.9 CCSS.ELA-Literacy.RST.9-10.10 SC.912.N.1.1-SC.912.N.1.7, SC.912.N.2.1-SC.912.N.2.5, SC.912.N.3.1-SC.912.N.3.5, SC.912.N.4.1-SC.912.N.4.2</p>	<p>CCSS.ELA-Literacy.RST.9-10.1 CCSS.ELA-Literacy.RST.9-10.2 CCSS.ELA-Literacy.RST.9-10.3 CCSS.ELA-Literacy.RST.9-10.4 CCSS.ELA-Literacy.RST.9-10.5 CCSS.ELA-Literacy.RST.9-10.6 CCSS.ELA-Literacy.RST.9-10.7 CCSS.ELA-Literacy.RST.9-10.8 CCSS.ELA-Literacy.RST.9-10.9 CCSS.ELA-Literacy.RST.9-10.10 SC.912.L.17.1- SC.912.L.17.20, SC.912.L.17.7</p>	<p>CCSS.ELA-Literacy.RST.9-10.1 CCSS.ELA-Literacy.RST.9-10.2 CCSS.ELA-Literacy.RST.9-10.3 CCSS.ELA-Literacy.RST.9-10.4 CCSS.ELA-Literacy.RST.9-10.5 CCSS.ELA-Literacy.RST.9-10.6 CCSS.ELA-Literacy.RST.9-10.7 CCSS.ELA-Literacy.RST.9-10.8 CCSS.ELA-Literacy.RST.9-10.9 CCSS.ELA-Literacy.RST.9-10.10 SC.912.L.16.1, SC.912.L.16.2, SC.912.L.16.3, SC.912.L.16.4, SC.912.L.16.5, SC.912.L.16.6, SC.912.L.16.10, SC.912.L.16.11, SC.912.L.16.12, SC.912.L.16.14, SC.912.L.16.15, SC.912.L.16.17, SC.912.L.17.18, SC.912.L.17.5, SC.912.L.17.8, SC.912.L.17.9,</p>	<p>CCSS.ELA-Literacy.RST.9-10.1 CCSS.ELA-Literacy.RST.9-10.2 CCSS.ELA-Literacy.RST.9-10.3 CCSS.ELA-Literacy.RST.9-10.4 CCSS.ELA-Literacy.RST.9-10.5 CCSS.ELA-Literacy.RST.9-10.6 CCSS.ELA-Literacy.RST.9-10.7 CCSS.ELA-Literacy.RST.9-10.8 CCSS.ELA-Literacy.RST.9-10.9 CCSS.ELA-Literacy.RST.9-10.10 SC.912.E.7.1, SC.912.E.7.2, SC.912.E.7.3, SC.912.E.7.4, SC.912.E.7.8, SC.912.E.7.9, SC.912.L.17.10</p>	<p>CCSS.ELA-Literacy.RST.9-10.1 CCSS.ELA-Literacy.RST.9-10.2 CCSS.ELA-Literacy.RST.9-10.3 CCSS.ELA-Literacy.RST.9-10.4 CCSS.ELA-Literacy.RST.9-10.5 CCSS.ELA-Literacy.RST.9-10.6 CCSS.ELA-Literacy.RST.9-10.7 CCSS.ELA-Literacy.RST.9-10.8 CCSS.ELA-Literacy.RST.9-10.9 CCSS.ELA-Literacy.RST.9-10.10 SC.912.L.17..11, SC.912.L.17.12, SC.912.L.17.13, SC.912.L.17.15, SC.912.L.17.16, SC.912.L.17.19, SC.912.L.17.20</p>
<p>Integrated CCSS Writing Standards (List): *See Below for Links</p>	<p>CCSS.ELA-Literacy.W.9-10.1 CCSS.ELA-Literacy.W.9-10.2 CCSS.ELA-Literacy.W.9-10.4 CCSS.ELA-Literacy.W.9-10.5 CCSS.ELA-Literacy.W.9-10.7 CCSS.ELA-Literacy.W.9-10.9</p>	<p>CCSS.ELA-Literacy.W.9-10.1 CCSS.ELA-Literacy.W.9-10.2 CCSS.ELA-Literacy.W.9-10.4 CCSS.ELA-Literacy.W.9-10.5 CCSS.ELA-Literacy.W.9-10.7 CCSS.ELA-Literacy.W.9-10.9</p>	<p>CCSS.ELA-Literacy.W.9-10.1 CCSS.ELA-Literacy.W.9-10.2 CCSS.ELA-Literacy.W.9-10.4 CCSS.ELA-Literacy.W.9-10.5 CCSS.ELA-Literacy.W.9-10.7 CCSS.ELA-Literacy.W.9-10.9</p>	<p>CCSS.ELA-Literacy.W.9-10.1 CCSS.ELA-Literacy.W.9-10.2 CCSS.ELA-Literacy.W.9-10.4 CCSS.ELA-Literacy.W.9-10.5 CCSS.ELA-Literacy.W.9-10.7 CCSS.ELA-Literacy.W.9-10.9</p>	<p>CCSS.ELA-Literacy.W.9-10.1 CCSS.ELA-Literacy.W.9-10.2 CCSS.ELA-Literacy.W.9-10.4 CCSS.ELA-Literacy.W.9-10.5 CCSS.ELA-Literacy.W.9-10.7 CCSS.ELA-Literacy.W.9-10.9</p>



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Links to CCSS/NGSSS Curriculum Standards:	<p>The following links will be used to incorporate the CCSS and other applicable standards:</p> <ul style="list-style-type: none"> • The Common Core State Standard expectations in grade 9-12, • The K-12 English LA and Content Area Writing Standards • The K-12 Reading Standards • The K-12 Mathematics Standards • The K-12 NGSSS Science & Social Studies Standards 				
Purpose of Planning	Unit Six Our Health and Our Future Q4, W33-36				
Unit Topic and Overview:	The study of environmental science relates not only to the past but learning and planning for our future.				
Prerequisite Student Knowledge *What should students have previously mastered prior to this unit?	Students should have background knowledge of all environmental issues/topics presented in previous units.				



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<p>Essential Knowledge & Student Expectations *What are the anticipated learning outcomes for students?</p>	<p>Students will demonstrate knowledge of environmental issues/topics by making connections to future planet health, future human health, and future environmental legislation.</p> <p>Essential Questions: 1. Explain, "What does the average person not know" in relationship to the environmental studies of this course. Additionally correlate how do humans influence the environment and how the environment influences humans too. 2. Pass an Environmental Law Project. Students will research previous environmental legislation presented in the course and propose a new law/bill to protect some aspect of environmental science.</p>				
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<p>Anchor Text and Supplemental Texts *Illustrate texts used, and how students' knowledge builds across units.</p>	<p>Anchor Texts: Heithaus, M. and Arms, K. <u>Environmental Science</u>. Orlando, Florida. Holt McDougal, 2013 Ch 20 The Environment and Our Health (pg 510-530) Ch 21 Economics, Policy, and the Future (pg 532-554) Literary Texts:</p> <p>Informational Texts: Case Study -pg 516 Chemicals in Homes -pg 536 Saving species</p>				
<p>Multi-Media Links: *Videos, presentations, any and all supplemental online material.</p>	<p>-Discovery Education Video: <u>The Human Condition: What You Don't Know...</u></p>				



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<p>Instructional Practices: * Various Instructional Modalities, including Technology used</p>	<p>-Bell work and discussion of Essential Questions -Lecture with PowerPoint, students take notes on laptops -Focused reading of anchor text and vocabulary -Labs: Lead Poisoning and Mental Ability (pg 530), Organizing a Sustainable Product Guide (pg 554) -Labs reinforce topics with hands-on experiments in the local environment -Case Studies relate articles to topics within the unit</p> <p>*Most handouts, labs, and assignments are done electronically (via word document and submitted via e-mail- to reduce paper consumption within this course.)</p>				
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Interdisciplinary Lessons & Projects: *State additional content areas and title all lesson(s) and project(s)	-Pass an environmental policy project (science, LA/Writing, Math, economics, politics, history)				
Honors Course Differentiation(s):	N/A				



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<p>Integrated CCSS Writing Standards (List): *See Below for Links</p>	<p>CCSS.ELA-Literacy.W.9-10.1 CCSS.ELA-Literacy.W.9-10.2 CCSS.ELA-Literacy.W.9-10.4 CCSS.ELA-Literacy.W.9-10.5 CCSS.ELA-Literacy.W.9-10.7 CCSS.ELA-Literacy.W.9-10.9</p>				
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