



Teaching Units for High School Science Developed by  
Duke University Graduate Students in Pharmacology 693/694  
Master of Arts in Teaching (MAT)

<http://sites.duke.edu/rise/duke-courses/pharm-693694/>

## Daily Lesson Plan

<b>Course Name: AP Environmental Science/AP Biology</b>	<b>Ⓢ Standard Ⓢ Honors ● AP</b>
<b>Unit Title: Ecological Health of the Ellerbe Creek Watershed and its Environmental Implications</b>	<b>Day/Date: Day 12 of 16</b>
<b>Relevant NC Standard Course of Study Goal(s):</b> <ul style="list-style-type: none"> <li>• <b>Bio.2.1</b> Analyze the interdependence of living organisms with their environment.</li> <li>• <b>Bio.2.2</b> Understand the impact of human activities on the environment.</li> <li>• <b>EEn.2.2</b> Understand how human influences impact the lithosphere.</li> </ul>	
<b>Specific Lesson Objectives</b>	
<b>Students will understand:</b> <ol style="list-style-type: none"> <li>1. Interactions among living systems and with their environment result in the movement of matter and energy relating to the significance of each to maintain the health and sustainability of an ecosystem.</li> <li>2. Human activities (including population growth, urbanization, pollution, global warming, burning of fossil fuels, habitat destruction, and introduction of non-native species) may impact the environment from one generation to the next.</li> <li>3. Humans influence freshwater availability and quality in North Carolina's river basins, wetlands, and tidal environments.</li> <li>4. The diversity of species within an ecosystem may influence the stability of the ecosystem.</li> <li>5. Interactions between and within populations influence patterns of species distribution and abundance.</li> </ol>	
<b>Students will know:</b> <ol style="list-style-type: none"> <li>1. How humans modify ecosystems through population growth, technology, resource consumption, and production of waste</li> <li>2. How to interpret data regarding the historical and predicted impact on ecosystems and global climate change</li> <li>3. That urban development in the North Carolina Piedmont leads to habitat destruction and urban runoff</li> <li>4. The effects of pesticides, herbicides, and pharmaceuticals on freshwater ecosystem health</li> <li>5. Non-point sources of pollution</li> <li>6. How biotic and abiotic factors affect biodiversity</li> <li>7. How to evaluate the quality of North Carolina streams (chemical &amp; physical properties and biotic indices)</li> </ol>	
<b>Students will be able to:</b> <ol style="list-style-type: none"> <li>1. Read and interpret a primary, scientific journal article through the lens of the scientific method</li> <li>2. Analyze collected scientific data</li> <li>3. Write a scientific research paper that includes the introduction, materials and methods, results, discussion, and literature cited sections</li> </ol>	

<b>Key Vocabulary for this Lesson</b>
<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<b>Materials</b>
<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<b>Technology Needs</b>
<ul style="list-style-type: none"> <li>• Laptop cart</li> </ul>

<b>LESSON ACTIVITIES</b>			
<b>Opening (Hook, Warm-Up, Anticipatory Set, Review, etc.)</b>			
<p><i>Describe activity to elicit active involvement of students or refer to previous learning:</i>  <i>Warm-up</i> – Teacher will guide students through the intricacies of writing the introduction, materials and methods, results, discussion, and literature cited sections of a research paper. Students will learn how to cite using the <i>Ecology</i> format.</p>			
<b>Procedure: Include all sections that apply to this lesson; combine as necessary.</b>			
<b>Section</b>	<b>Time</b>	<b>What the Teacher will do:</b>	<b>What the Students will do:</b>
<b>Statement of Objective &amp; Purpose</b>	5 minutes	<ol style="list-style-type: none"> <li>1. Teacher will provide an overview of the day: students will learn about how to write certain sections of a research paper and be informed how these sections are to be written; students will be assigned to new groups to begin writing their section of the paper</li> </ol>	<ol style="list-style-type: none"> <li>1. Listen</li> </ol>
<b>Input, Modeling, &amp; Check for Understanding</b>	15 minutes	<ol style="list-style-type: none"> <li>1. Teacher will break expert groups up into the new groups of: Introduction, Materials and Methods, Results, and Discussion</li> <li>2. Teacher will reiterate the structure and importance of each section of an academic journal article</li> <li>3. Teacher will demonstrate how to cite sources using the <i>Ecology</i> format</li> </ol>	<ol style="list-style-type: none"> <li>1. Students will arrange themselves in their new groups to ensure each section (Introduction, Materials and Methods, Results, and Discussion) has an expert member</li> <li>2. Students will actively take notes and ask questions</li> </ol>
<b>Guided Practice</b>	0 minutes	N/A	N/A

<b>Independent Practice/ Homework</b>	65 minutes	1. Teacher will spend time with each group to assist groups in the writing of their assigned sections and provide ideas as to how to present information	1. Students will begin brainstorming and writing their sections of the research paper
<b>Closing/ Summary</b>	5 minutes	1. Teacher will ensure all laptops are returned to the cart  2. Teacher will assign homework: students should continue writing their paper and creating their section of the literature cited section. They will email the literature cited section to the teacher for review and to concatenate into a single document	1. Students will return laptops to carts  2. For homework, students will continue writing their section of the paper and will email the teacher a copy of their section of the literature cited for review
<b>Assessment of Student Learning</b>			
<p><i>How &amp; when will you know that the students have learned this material?</i>                  Completed student research paper, presentation to Durham City Council</p>			
<b>Differentiation Strategies*</b>			
<b><i>How will you adjust aspects of the lesson to accommodate student READINESS?</i></b>			
<b>Struggling Students:</b>	<b>Gifted/Advanced Students:</b>	<b>English Language Learners:</b>	
<p>The restructuring of the groups from expert groups to section groups allows for struggling students to be considered experts within their new groups. Students will also be placed into the new section groups based on abilities. Students that are mathematically inclined will be assigned to work in the Results group. Students who excel as writers and critical thinkers will write the Introduction and Discussion sections. Those who are methodical and excellent record keepers will be responsible for the Materials</p>	<p>The restructuring of the groups from expert groups to section groups allows for struggling students to be considered experts within their new groups. Students will also be placed into the new section groups based on abilities. Students that are mathematically inclined will be assigned to work in the Results group. Students who excel as writers and critical thinkers will write the Introduction and Discussion sections. Those who are methodical and excellent record keepers will be responsible for the Materials and Methods section.</p>	<p>N/A</p>	

and Methods section.		
<b><i>How will you adjust aspects of the lesson to accommodate students' LEARNING PROFILES?</i></b>		
N/A		
<b><i>How will you adjust aspects of the lesson to accommodate students' INTERESTS?</i></b>		
N/A		