

COURSE UNIT PLAN

Title of Unit: Environmental Factors – Plant Science & Physiology
Curriculum Area: Environmental Science

Grade Level: 11
Time Frame: 3 weeks

DESIRED RESULTS

Common Core State Standards	College and Career Readiness Standards
<p><i>What standards are you specifically targeting in this lesson?</i></p> <p><u>CCSS.ELA-LITERACY.RST.11-12.9</u> Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p><u>CCSS.ELA-LITERACY.RST.11-12.7</u> Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p> <p><u>CCSS.ELA-LITERACY.RST.11-12.8</u> Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>	<p><i>Which technical standards/21st century skills are you specifically targeting in this lesson?</i></p> <p><u>Creativity, critical thinking, communication and coloration.</u></p> <ul style="list-style-type: none"> • Has a focus on creativity, and innovative problem solving and creative thinking used to formulate sound judgement, to communicate and collaborate to accomplish task and develop solutions. <p><u>Information, Media and Technology</u></p> <ul style="list-style-type: none"> • Has a focus on information and media literacy to improve productivity, solve problems and create opportunities. <p><u>Career Development</u></p> <ul style="list-style-type: none"> • Has a focus on personal and social, academic, career content and employability skills. <p><u>Leadership</u></p> <ul style="list-style-type: none"> • Has a focus on applying leadership skills in real-world, business and industry applications.
Understandings/Knowledge/Skills	Essential Questions
<p><i>What do you want students to understand, know, and/or be able to do at the end of this unit?</i></p> <ul style="list-style-type: none"> • Understand how cultural environment affects plant growth and selection. • Understand environmental factors that affect plant growth. 	<p><i>What questions will foster inquiry, understanding, and transfer of learning?</i></p> <ul style="list-style-type: none"> • What is a biome? • How does light affect plant growth? • How does temperature affect plant growth? • What nutrients are essential for healthy plant growth?

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ASSESSMENT EVIDENCE

Performance Task	Other Evidence
<p><i>How will you authentically assess students to determine if they have mastered the material?</i></p> <ul style="list-style-type: none"> • Completed lab reports • Successful culture and growth of radish seeds <p><i>What criteria will you use to assess the levels of mastery?</i></p> <ul style="list-style-type: none"> • Rubric for lab reports 	<p><i>Tests, quizzes, independent practice, journals, formative assessments, etc.</i></p> <ul style="list-style-type: none"> • Unit Test • Lab journal entries • Exit tickets <p><i>How will students reflect upon and self-assess their learning?</i></p> <ul style="list-style-type: none"> • Students will use a rubric to self-assess and peer review their work during lab.

LEARNING PLAN

Focus of the Week	Learning Activities	Assessments (Formal and Informal)
<p>Week 1: Lesson 1 – Understanding Environmental Factors on Plant Growth</p> <p>Day 1: Students will be assessed of their knowledge of environmental factors using an interactive PowerPoint.</p> <p>Day 2: Students will set up an experiment where each factor is assessed to understand its importance.</p>	<p>“Biome Lab Experiment”</p>	<p>Students turn in lab reports from Biome experiment, making sure to relate the experiment to each environmental factor of light, water, temperature, and nutrient availability. Reports evaluated on accuracy and understanding of the environmental factors and detailed reporting of data from experiment</p>

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<p>Week 1: Lesson 2 – Understanding the Influence of Light on Plant Growth</p> <p>Day 3: Students will grow bean plants. One plant will be placed in the light and one plant will be placed in a dark locker. Germination will take 3-5 days. Students will observe which plant will grow “faster”</p> <p>Day 4: Students will hypothesize will have a student led discussion on light and its importance during germination. They will answer the question, is light important in seed germination? Once the seed has germinated is the lack of light detrimental to healthy plant growth?</p>	<p>Students take notes on information. Students write hypothesis on classroom lab experiment and take daily data recordings on growth</p>	<p>Students write up a lab report on their observations of the interest approach and the extended classroom activity. The lab report should include a hypothesis, all data collected and a summary of results, including an explanation for the results noted. Evaluate understanding of lesson concepts according to the completeness and accuracy of information provided in the write-up.</p>
<p>Week 1: Lesson 3 – Understanding Temperature Effects on Plant Growth</p> <p>Day 5: Students will read an article and develop a plan to help local farmers grow during the winter months. What can be done to prevent major crop loss due to frost damage?</p>	<p>Students take notes on information. Students read articles about crop loss and frost damage.</p>	<p>Students summarize and report information gained from readings. Students develop a freeze damage response plan for local farmers</p>
<p>Week 2: Lesson 4 – Understanding the Water Cycle</p> <p>Day 1: Students will be taught about the water cycle. They will view informational video on the importance of water.</p>	<p>Students take notes on information. Students participate in teacher-led discussion and demonstration regarding local water cycle</p>	<p>Students create water cycle graphic using appropriate vocabulary.</p>

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<p>Day 2: Students will then create a graphic accessing their understanding of the water cycle.</p>		
<p>Week 2: Lesson 5 – Primary, Secondary & Micro Nutrients Necessary for Plant Growth</p> <p>Day 3: Students will look at plants grown in the greenhouse. They are accessed on which nutrients are missing and what next steps should be taken to restore healthy plant appearance.</p> <p>Day 4: Students will be accessed of on each nutrient and how contribute to plant health.</p>	<p>Students take notes on information</p>	<p>Notebook check</p>
<p>Week 2: Lesson 6 – Functions of Essential Nutrients in Plant Growth</p> <p>Day 5: Nutrient deficiencies lab will be performed by the students. A report will be developed with all of the research and findings from this experiment.</p>	<p>Students take notes on information and conduct lab experiments</p>	<p>Students write up a lab report on their observations and findings from the lab. Report should include hypothesis, observational data collected and a summary of results, including explanation.</p>
<p>Week 3: Lesson 9 - Symptoms of Nutrient Deficiencies (N,P,K,Fe,S,Mg,B and Zn)</p> <p>Day 1: Assessment on water</p> <p>Day 2: Assessment on temperature</p>	<p>Student analyze common houseplants for nutrient deficiencies and provide diagnosis and treatment</p>	<p>Students prepare a report on diagnosis and care of a plant</p>

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Week 3: Review & Test Day 3: Assessment on temperature Day 4: Assessment on nutrition Day 5: Unit Test	Students play will play and interactive game to review for final formative assessment	Unit Test
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EXAMPLE

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