

**“Pride Inside”**

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| **Teachers:** | Willy L. Herrera  |
| **Date:** | September 26, 2013 |
| **Content:** | **Biology** |
| **Unit:** | Skills and Processes |
| **Topic:** | Experimental Design |
| **Core Learning Goal(s)****or VSC Standard(s)** | ***Skills and Processes:*****1.2.1** The student will identify meaningful, answerable scientific questions. **1.2.3** The student will formulate a working hypothesis. **1.2.4** The student will test a working hypothesis**1.2.5** The student will select appropriate instruments and materials to conduct an investigation.**1.4.1** The student will organize data appropriately using techniques such as tables, graphs, and webs (for graphs: axes labeled with appropriate quantities, appropriate units on axes, axes labeled with appropriate intervals, independent and dependent variables on correct axes, appropriate title).**1.3.3** The student will demonstrate safe handling of the chemicals and materials of science**1.5.4** The student will use tables, graphs, and displays to support arguments and claims in both written and oral communication.***Common Core State Standards:******RST 9-10.1*** *Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.* ***RST.9-10.10*** *By the end of grade 10, read and comprehend Science/technical texts in the grades 9-10 text complexity band independently and proficiently.* **RST.9-10.7** Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or a chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. ***ENVIRONMENTAL SCIENCE STANDARDS:**** **6.4.2** Design and conduct the research.

Methods of data collection may include field or laboratory questionnaire/opinionnaire * **6.4.3** Interpret the findings to draw conclusions and make recommendations to help resolve the issue.
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| **Objective:** | At the end of the lesson students will be able to learn how to do a field research by conducting a field study answering the question “When will the growing season for trees in our school yeard end this autumn?” |
| ***Assessment Focus:******(Key Idea)*** | **BIG IDEAS:*** There is more than one way to do science.
* Science is a problem solving process as well as a body of knowledge.

**MAIN IDEAS:*** Experiments are often repeated and/or modified by scientists in order to find the answer to a scientific question.
* Hypotheses are statements based on observations and research that provide possible answers to scientific questions.
* We use carefully designed experiments to test hypotheses.
* A hypothesis must be measurable.
* An experiment can be designed to test a measurable hypothesis.
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| **Materials Needed:** | Students:1. Writing instruments
2. Binder
 | Teacher:1. Hand Outs
2. Document camera
3. Flagging and/or metal tags
4. Data sheets
5. Clipboards/pencils
6. Tree field ID guides
7. Metric ruler
8. Permanent marker
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| **Handouts:** | 1. Warm Up sheet
2. Lab Protocol
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| **Background:** | Understanding science concepts requires a lot of skills and processes such as observing, investigating, and critical thinking. These skills are vital in problem solving. In science, problem solving requires inquisitive minds and extra skills in conducting investigations. One of the major lessons taught in science classes is the concept of scientific method; the method itself is not fixed to certain steps as it varies depending on the situation and needs.In today’s lesson, students will demonstrate and would be able to recognize the value of scientific investigation in problem solving. Although the lesson is designed to teach students how to conduct a field research, this will teach students the main steps they will use in scientific investigations. |
| **Essential Question:** | *When does the growing season for trees in our schoolyard end this autumn?* |
| **Accommodations and Modifications:** |

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| **STUDENT INITIAL** | **ACCOMODATIONS/MODIFICATIONS** |
| **Presentation Accommodations** | **Response Accommodations** | **Timing and Scheduling Accommodations** | **Setting Accommodations** | **Supplementary Aids** |
| 1. R.W(P2)
 | **(1-G)**Human Reader for verbatim reading of selected sections of the test.  | **(2-J)** Calculation Devices | **(3-A)** Extended time | **(4-A)** Reduce distractions to the students | **(1C) allow use of organizational aid****(2A) Altered/modified assignment****(1B) Allow use of manipulative** |
| 1. A.W (P2)
 |  | **(2-J)** Calculation Devices (2-L) visual organizer |  | **(4-A)** Reduce distractions to the students | **91H) Monitor independent work** |
| 1. J.B (P2)
 |  | **(2-J)** Calculation Devices  | **(3-A)** Extended time**(3-B)** Multiple or frequent breaks | **(4-A)** Reduce distractions to the students | (5C) Classroom instructional consult(1D) Check for understanding(4H) Preferential seating(3F) Encourage student to ask for assistance when needed |

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| **Warm-Up** | * Students will complete the pre-assessment on the Chemistry of Life unit.
 | Level(s) of Bloom’s taxonomy: | I KnowledgeII ComprehensionIII ApplicationIV AnalysisV SynthesisVI Evaluation |
| **Engagement** | * Students will be asked to read, annotate and summarize the text “Factors Affecting Autumn Leaf Color.”
* Students will be familiarized with the lab protocol for the field investigation.
 |  | I KnowledgeII ComprehensionIII ApplicationIV AnalysisV SynthesisVI Evaluation |
| **Exploration**  | * Students will work in pairs in conducting a field investigation.
* Students will perform the first part of their field investigation by:
	1. Flagging the trees
	2. Measuring the width and length of the leaves assigned to them.
	3. Make field notes of the weather and plants/animals spotted in the research site.
* Students will formulate their hypothesis.

**Di** | Level(s) of Bloom’s taxonomy:  | I KnowledgeII ComprehensionIII ApplicationIV AnalysisV SynthesisVI Evaluation |
| **Explanation** | * Students will be asked to state their hypothesis in a form of argumentation where they have to state a claim and provide warrants to their claim. Students can use their prior experience of the season and the text they have read as warrants.
 | Level(s) of Bloom’s taxonomy:  | I KnowledgeII ComprehensionIII ApplicationIV AnalysisV SynthesisVI Evaluation |
| **Extension** | Students will be asked to read, annotate, and summarize the text “ Autumn Foliage Color: Past, Present, and Future” | Level(s) of Bloom’s taxonomy:  | I KnowledgeII ComprehensionIII ApplicationIV AnalysisV SynthesisVI Evaluation |
| **Evaluation** | * Student-completed laboratory report will serve as the evaluation of the lesson, where students will present their investigation from the statement of the problem to the formulation of the conclusion.
 | Level(s) of Bloom’s taxonomy: | I KnowledgeII ComprehensionIII ApplicationIV AnalysisV SynthesisVI Evaluation |
| **Homework** | * Students will be asked to observe the color of the trees around their community.
* Students will be asked to take pictures of the trees in their community to be emailed to willylherrera75@yahoo.com.
 | Level(s) of Bloom’s taxonomy: | I KnowledgeII ComprehensionIII ApplicationIV AnalysisV SynthesisVI Evaluation |
| **Summary** | * Students will be asked to answer the following questions:
	+ 1. What are the basic steps of scientific investigation?
		2. Differentiate dependent, independent, and control variables.
		3. How are hypothesis and conclusion similar? How are they different?
 | Level(s) of Bloom’s taxonomy: | I KnowledgeII ComprehensionIII ApplicationIV AnalysisV SynthesisVI Evaluation |
| **References/Credits:** | 1. Kathy Schrock’s Guide for Educators
2. [www.havefunteaching.com/science-songs/scientific-method-song](http://www.havefunteaching.com/science-songs/scientific-method-song)
3. <http://www.biologycorner.com/>
4. <http://qldscienceteachers.tripod.com/worksheets/junior/biology/>
5. <http://www.tes.co.uk/TaxonomySearchResults.aspx?parametrics=44354,44478&event=23&mode=browse>
6. <http://www1.dcsdk12.org/secondary/dchs/index.php?pagenum=624601>
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| **Reflections:**  | * What went well and why?
* What didn’t go well and why?
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| ***Areas for Improvement:*** |  |
| ***NOTES:*** |  |

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PRE-ASSESSMENT: CHEMISTRY OF LIFE

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