LISBON SCHOOL DEPARTMENT
UNIT DESIGN OUTLINE

Unit Title: Unit 1: Scientific Method & Problem Solving

Unit Designers: Jill Denniston

Level(s): Freshmen Time Span: 4 weeks

Content Area:

☐Career Prep	☐Health/PE	☐M&C Languages	☐Social Studies
☐English Language Arts	☐Mathematics	☒Science & Tech	☐Visual & Perf. Arts

Summary of Unit:

In this unit students will be able to identify the steps scientists often use to solve problems. Describe why scientists use variables in their studies, and be able to compare and contrast science and technology. Students will learn to name the prefixes used in International System of Measurement (SI) and to successfully identify SI units and symbols for length, volume, mass, density, time and temperature. Students will also be asked to identify three types of graphs and explain the ways graphs are used along with being able to distinguish between dependent and independent variables.

Content Standards/Performance Indicators:

B. The Skills and Traits of Scientific Inquiry and Technological Design
B.1. Skills and Traits of Scientific Inquiry: Student methodically plan, conduct and analyze data from, and communicate results of in-depth scientific investigations, including experiments guided by a testable hypothesis.
B.2. Students use a systematic process, tools and techniques, and a variety of materials to design and produce a solution or product that meets new needs or improves existing designs.
C1. Students describe key aspects of scientific investigations: that they are guided by scientific principles and knowledge, that they are performed to test ideas, and that they are communicated and defended publicly.
C2. Students explain how the relationship between scientific inquiry and technological design influences the advancement of ideas, products, and systems.

Key Pre-Requisites:

***Knowledge*:**
Students should already be familiar with the use of the British measurement system.
Student should be familiar with performing simple lab experiments and recording of data.

***Skills*:**
Students should be able to use a triple beam balance, read a ruler and read a thermometer

Enduring Understandings:

The scientific method is a logical approach to problem solving through research, testing, analysis, and retesting and can be used to solve any kind of problem.
The metric system is the internationally accepted unit of measurement in science.
Mathematics is the language of science.
Graphs are a quick way to communicate a lot of information in a small amount of space

Essential Questions that Guide and Focus This Unit:
What is the scientific method and why is it is important?
What are the international units of measurement?
How is the use of independent and dependent variable useful in scientific exploration?
Why are graphs a good way to display large quantity of data?

Key Knowledge and Skills students will acquire as a result of this unit:

Knowledge:
Understand the scientific method.
Understand difference between International System of Measurements (SI)
Understand use of graphs

Skills:
Solve problems using scientific method
Be able to convert metric measurements
How to correctly measure volume, mass, length and density
Successfully draw and interpret information related to graphs.

**How will students provide evidence of their understandings? **
Density Lab (B1)
Deadly Picnic Activity: Lab on Deductive Reasoning (B1)
Experimental Analysis Quiz (C1)
How is a Controlled Experiment Performed? (C1)

Teaching and Learning experiences used to help students understand:
Check-in/Activator Questions
K-W-L to begin unit
Pair Shares
Brainstorming
Modeling
Direct instruction
Vocabulary strategies (foldable(s), flash cards)
Venn Diagrams
Inquiry based labs

Provisions for Extending Learning:
Students will develop, write up and perform a lab to test the scientific method.

How will technology be used to increase student achievement?
Use of the textbook Virtual Lab CD

Attach a copy of the unit assessment tool, including criteria for evaluation of student performance/product.

Experimental Analysis Quiz