Unit 1: Scientific Methods and Measurements

Content Area: **Science**
Course(s):
Time Period:
Length: **10 days**
Status: **Published**

State Mandated Topics Addressed in this Unit

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N/A	N/A

Unit Summary

The purpose of this unit is to introduce students to the importance of science in their everyday lives and to validate their results. The purpose of this unit is to introduce. Teach students how to explore and use the scientific method to solve everyday problems and constructing experiments to validate their results. Students will learn how to use scientific notation, the difference between accuracy and precision, how to make and read measurements in English and SI units, how to use significant figures, the density formula and how to make conversions using dimensional analysis.

Enduring Understanding

- Dimensional Analysis is a useful tool.
- Measurements are not exact.
- Science explains the natural world.
- Solving problems requires an appreciation of the big picture.

Learning Objectives

- How do scientists express the degree of uncertainty in their measurements?
- How do scientists solve problems?
- When you make a measurement, what are some possible sources of uncertainty?
- Why is it important to study science?
- Why is it important to study so many subjects in school?
- Why is it useful to learn problem solving skills?

Essential Skills

- Analyze and solve real world occurrences using the scientific method.
- Calculate the density of a substance.
- Demonstrate why metric units are easy to use.
- Describe the steps in the scientific method.
- Describe the type of problems that use dimensional analysis
- Evaluate accuracy and precision.
- Evaluate the difference between a scientific law and a theory.
- Explain the process when using a conversion factor.
- Express numbers in scientific notation.
- Explain why the scope of science is so vast.

Standards

SCI.HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

Instructional Tasks/Activities

- Common assessment chapter test
- Common assessment quiz
- Constructed response
- Do nows and/or exit slips
- Exit Cards (answer to daily objective questions)
- Graphic organizers or models
- Guided practice
- Homework
- Individual, small, and large group work
- Laboratory investigations within small groups
- Review Activity
- Safety Poster/Presentation (identification of safety rule from student-designed posters)
- Section Review Questions
- Study Guide Packets
- Vocabulary flash cards or map (word, picture, sentence, example)

Assessment Procedure

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly. This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment

common to all college prep students.

- Classroom Total Participation Technique
- Classwork
- DBQ
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Flashcards and/or drill and practice
- Inquiry based activities with reflective discussion
- Journal / Student Reflection
- Kahoot
- Laboratory groups
- Lecture with note taking or guided notes
- Online models and simulators
- Other named in lesson
- Peer Review
- Performance
- Powerpoint presentations
- Problem Correction
- Project
- Quiz
- Rubric
- Teacher Collected Data
- Test
- Whole and small group discussions
- Worksheet

Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Chromebook
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Copy/Paste Content Specific Link Here
- Gimkit
- GoGuardian
- Google Classroom
- Google Docs
- Google Forms

- Google Slides
- Kahoot
- MagicSchool AI
- Other- Specified in Lesson
- Quiziz
- Screencastify

Accommodations & Modifications & Differentiation

Accommodations and Modifications should be used to meet individual needs. Their IEP and 504 plans should be used in addition to the following suggestions.

Gifted and Talented

- Compare & Contrast
- Conferencing
- Debates
- Jigsaw
- Peer Partner Learning
- Problem Solving
- Structured Controversy
- Think, Pair, Share
- Tutorial Groups

Instruction/Materials

- alter format of materials (type/highlight, etc.)
- color code materials
- eliminate answers
- extended time
- extended time
- large print
- modified quiz
- modified test
- Modify Assignments as Needed
- Modify/Repeat/Model directions
- necessary assignments only
- Other (specify in plans)

- other- named in lesson
- provide assistance and cues for transitions
- provide daily assignment list
- read class materials orally
- reduce work load
- shorten assignments
- study guide/outline
- utilize multi-sensory modes to reinforce instruction

Environment

- alter physical room environment
- assign peer tutors/work buddies/note takers
- assign preferential seating
- individualized instruction/small group
- modify student schedule (Describe)
- other- please specify in plans
- provide desktop list/formula

Honors Modifications

Resources

- Resource 1
- Resource 2
- Resource 3
- Resource 4
- Resource 5