Unit 1: What is Science? Scientific Investigations

Unit Overview

Inquiry Statement - Scientific evidence is used to communicate and express concepts that form personal and societal understandings about our world.

Global Context: Personal and Cultural Expression

Key Concept: Communication      Related Concept: Evidence

Standards (TEKS):

2A plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology.

2B design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;

2C collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;

2D construct tables and graphs, using repeated trials and means, to organize data and identify patterns;

2E analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.

(Some) Unit Questions:

- What are the characteristics of science?
- What is a scientific lab report?
- How does the hypothesis relate to the experiment?
- What is the proper way to use scientific tools?
- How is a scientific explanation evaluated?
- What are some common science misconceptions?
- How do scientists document and communicate their work?
- How does a scientist’s work become part of the overall human knowledge?
- Why are safety considerations important in a lab setting?
- How do science and society work together?
- How can pseudoscience be determined from science?
Key Vocabulary Words:

Analyze – Review the data from an experiment to find out what they mean.
Assumption – Something that is believed to be true without proof.
Compare – Look at to find similarities and differences.
Conclusion - The summary of an experiment, based on data.
Control – A part of the experiment scientists hold constant so that it does not become a variable. For example, if you’re testing the effects of hot water on yeast, your control would be either room temperature water or cold water.
Data – Information from an experiment.
Describe – Explain something with words.
Evidence – Data used to support a conclusion.
Experiment – A test that is done to support or disprove a hypothesis. An idea or question that can be tested.
Inference (Infer) – Assume a fact, with limited proof, based on previous experience.
Interpret – Explain what something means; explain results of an experiment.
Investigation – A process designed to answer a question.
Law – A statement based on repeated experimental observations that describes some aspects of the universe.
Measure – Obtain information about something (weight, length, width, height, etc.)
Observe – To watch or look at something to get information.
Predict – Determine what you think will happen when you do an experiment before you do the experiment.
Theory – A well-supported explanation for something that occurs in nature.
Variable – A part of an experiment that is changed. There are two main ones we will focus on: 1. Independent, what is changed on purpose and 2. Dependent variable, changes based on the experiment.

Scientific Tools and Equipment: