**Chapter 2: Mathematics and Models in Science**

**8th Grade**

**Description:**

This chapter looks at the different aspects of mathematical approaches used in science. We will take a closer look the proper techniques of measuring in science and practicing these techniques as well. We will also be learning about percent error, accuracy vs. precision, and significant figures. Finally we will end the chapter by learning how to properly graph data and looking at how models are used in science.

**Textbook Chapters: Chapter 2: Mathematics and Models in Science (pg. 40)**

**State Standards:**

**8.NS.1** Make Predictions and develop testable questions based on research and prior knowledge.

**8.NS.2** Plan and carry out investigations as a class, in small groups or independently often over a period of several class lessons.

**8.NS.3** Collect quantitative data with appropriate tools or technologies and use appropriate units to label numerical data.

**8.NS.4** Incorporate variables that can be changed, measures, or controlled.

**8.NS.5** Use the principles of accuracy and precision when making measurement.

**8.NS.6** Test predictions with multiple trials.

**8.NS.7** Keep accurate records in a notebook.

**8.NS.8** Analyze data, using appropriate mathematical manipulation as required, and use it to identify patterns and make inferences based on these patterns.

**8.NS.9** Present evidence using mathematical representations.

**8.NS.10** Compare the results of an experiment with the prediction.

**8.NS.11** Communicate findings using graphs, charts, maps, and models through oral and written reports.

**8.DP.1** Identify a need or problem to be solved.

**8.DP.2** Brainstorm potential solutions.

**8.DP.3** Document the design throughout the entire design process so that it can be replicated in a portfolio/notebook with drawings including labels.

**8.DP.4** Select a solution the need or problem.

**8.DP.5** Select appropriate materials.

**8.DP.6** Create a prototype.

**8.DP.7** Test how well solution meets goal.

**8.DP.8** Test the design using measurement.

**8.DP.9** Present evidence using mathematical representations (graphs, data tables).

**8.DP.10** Communicate the solution.

**8.DP.11** Redesign to improve the solution.

**Objectives:**

* Explain why scientists use a standard measurement system. (Section 1)
* Identify the SI units of measure for length, mass, volume, density, time, and temperature (Section 1)
* Describe what math skills scientists use in collecting data and making measurements. (Section 2)
* Identify the math tools scientists use to analyze their data (Section 2)
* Explain what kind of data line graphs can display. (Section 3)
* Explain how models are used in science. (Section 4)
* Describe different types of systems, and identify characteristics that all systems share. (Section 4)
* Examine models of natural systems, and compare the model to the system itself. (Section 4)

**Learning Activities:**

1. Introduction to *Mathematics and Models in Science* Lecture/Discussion
2. Untamed Science Video:
3. Measuring with SI Quick Lab (Section 1)
4. Metric Mania Scavenger Hunt (Section 1)
5. Measure of SI Quick Lab (Section 1)
6. Stations Lab (Section 2)
7. Article Summary: “US Hurricane Season Begins with a Splash as Isaac Unleashes on the Gulf States”
8. Chapter 2 Summative Assessment