Science
Honors Geophysical Science
Unit 1: Science Methods

Essential Understandings	▪ Causation: Nothing "just happens". Everything is caused. ▪ Interrelatedness: Everything in the universe is connected to everything else in the universe. ▪ Dynamism: Everything is changing in some way all the time. ▪ Entropy: Change has direction. Generally, simple precedes complex. Generally, order changes toward disorder. ▪ Uniformitarianism: The way the universe works today is the way it worked yesterday and the way it will work tomorrow.
Essential Questions	▪ How can two people in different locations measure a similar item and get consistent results? ▪ What is the purpose of measuring? ▪ How can observations be visually depicted to yield a conclusion? ▪ How do different measurement systems compare? ▪ How can measurements be expressed in different ways? ▪ What information can be gained from measurement analysis?
Essential Knowledge	▪ Scientists use a standard measuring system called SI. ▪ Measuring is a human creation used to describe and compare objects and events. ▪ Graphs are used to effectively display or describe relationships. ▪ Measurements consist of numbers and units. ▪ Research is a vital tool of scientists. ▪ Measurements can be displayed in multiple ways. ▪ Measurements can be compared.
Vocabulary	▪ Terms: o graphs: line, bar, pie o meter, liter, kilogram, Kelvin, second o derived units o density o dependent and independent variables o controls and constants o significant figures o scientific notation o accuracy, precision
Essential Skills	▪ Convert from one SI unit to another SI unit using dimensional analysis. ▪ Express numbers appropriately based on the measurements taken. ▪ Correctly show data on a graph. ▪ Correctly interpret data shown on a graph and predict new outcomes. ▪ Measure items precisely and accurately. ▪ Use a process to experimentally solve problems.
	Science and Technology B. The Skills and Traits of Scientific Inquiry and Technological Design B1.The Skills and Traits of Scientific Inquiry Students methodically plan, conduct, analyze data from, and

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Related Maine Learning Results	communicate results of in-depth scientific investigations, including experiments guided by a testable hypothesis. a. Identify questions, concepts, and testable hypotheses that guide scientific investigations. b. Design and safely conduct methodical scientific investigations, including experiments with controls. c. Use statistics to summarize, describe, analyze, and interpret results. d. Formulate and revise scientific investigations using logic and evidence. e. Use a variety of tools and technologies to improve investigations and communications. f. Recognize and analyze alternative explanations and models using scientific criteria. g. Communicate and defend scientific ideas.
Related Maine Learning Results	C. The Scientific and Technological Enterprise C1. Understandings of Inquiry Students describe key aspects of scientific investigations: that they are guided by scientific principles and knowledge, and that they are performed to test ideas, and that they are communicated and defended publicly. a. Describe how hypotheses and past and present knowledge guide and influence scientific investigations. b. Describe how scientists defend their evidence and explanations using logical arguments and verifiable results.
Sample Lessons And Activities	▪ Graphing Exercise ▪ Measurement Lab ▪ SI Conversion Worksheets ▪ Estimation activities ▪ Research, compare, and contrast two different measurement systems
Sample Classroom Assessment Methods	▪ SI Conversion Quiz ▪ Chapter Test ▪ Lab Reports ▪ Portfolio Project (science content and literacy)
Sample Resources	▪ Publications: o Discover Magazine o Glencoe Physical Science o MARVEL Data bases * o GALE Resource Data bases ** ▪ Audiovisual: o Multiple online interactive sites o Video: The Mechanical Universe o Video: ESPN Sports Figures