

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	▪ <u>Terms:</u> ○ graphs: line, bar, pie ○ meter, liter, kilogram, Kelvin, second ○ derived units ○ density ○ dependent and independent variables ○ controls and constants ○ significant figures ○ scientific notation ○ 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.
	<u>Science and Technology</u> 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. - Identify questions, concepts, and testable hypotheses that guide scientific investigations. - Design and safely conduct methodical scientific investigations, including experiments with controls. - Use statistics to summarize, describe, analyze, and interpret results. - Formulate and revise scientific investigations using logic and evidence. - Use a variety of tools and technologies to improve investigations and communications. - Recognize and analyze alternative explanations and models using scientific criteria. - 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. - Describe how hypotheses and past and present knowledge guide and influence scientific investigations. - 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	▪ <u>Publications:</u> ○ Discover Magazine ○ Glencoe <u>Physical Science</u> ○ MARVEL Data bases * ○ GALE Resource Data bases ** ▪ <u>Audiovisual:</u> ○ Multiple online interactive sites ○ Video: <u>The Mechanical Universe</u> ○ Video: <u>ESPN Sports Figures</u>