

Content Standards Addressed by the AnaSonde Curriculum

Subject Area	National Standard http://www.education-world.com/standards/national/	Montana Standard http://www.opi.mt.gov/pdf/Standards/	California Standard http://www.cde.ca.gov/be/st/ss/
Science	9-12.1(Science as Inquiry): 1. Abilities necessary to do scientific inquiry 2. Understandings about scientific inquiry	Content Standard 1: Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate the results and form reasonable conclusions of scientific investigations. <u>Students will:</u> 1. Generate a question, identify dependent and independent variables, formulate testable, multiple hypotheses, plan an investigation, predict its outcome, safely conduct the scientific investigations, and collect and analyze data. 2. Select and use appropriate tools including technology to make measurements (in metric units), gather, process and analyze data from scientific investigations using appropriate mathematical analysis, error analysis, and graphical representation. 3. Review evidence, communicate and defend results, and recognize that the results of a scientific investigation are always open to revision by further investigations. (e.g. through graphical representation or charts). 4. Analyze observations and explain with scientific understanding to develop a plausible model.	Investigation and Experimentation: 1. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other four strands, students should develop their own questions and perform investigations. Students will: B. Identify and communicate sources of unavoidable experimental error. C. Identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions. D. Formulate explanations by using logic and evidence. L. Analyze situations and solve problems that require combining and applying concepts from more than one area of science.
4.	9-12.2 (Physical Science): 4. Motions and Forces 6. Interactions of Energy and Matter	Content Standard 2: Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems. <u>Students will:</u> 7. Describe how energy and matter interact, including (A) waves, (B) the electromagnetic spectrum, (C) quantization of energy, and (D) insulators and conductors.	Physics: Waves: 4. Waves have characteristic properties that do not depend on the type of wave. As a basis for understanding this concept: A. Students know waves carry energy from one place to another. E. Students know radio waves, light, and X-rays are different wavelength bands in the spectrum of electromagnetic waves whose speed in a vacuum is approximately 3×10^8 m/s (186,000 miles/second).
	9-12.4(Earth and Space Science): 1. Energy in the earth system 2. Geochemical cycles	Content Standard 4: Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of	Earth Sciences: Energy in the Earth System: 5. Heating of Earth's surface and atmosphere by the sun drives convection within the

		<p>Earth's systems and other objects in space.</p> <p><u>Students will:</u></p> <p>4. Collect and analyze local and regional weather data to make inferences and predictions about weather patterns; explain factors influencing global weather patterns and climate; and describe the impact on earth of fluctuations in weather and climate (e.g., drought, surface and ground water, glacial instability).</p> <p>5. Explain the impact of terrestrial, solar, oceanic, and atmosphere conditions on global climatic patterns.</p>	<p>atmosphere and oceans, producing winds and ocean currents. As a basis for understanding this concept:</p> <p>6. Climate is the long-term average of a region's weather and depends on many factors. As a basis for understanding this concept:</p> <p>A. Students know weather (in the short run) and climate (in the long run) involve the transfer of energy into and out of the atmosphere.</p> <p>Earth Sciences:</p> <p>Structure and Composition of the Atmosphere:</p> <p>8. Life has changed Earth's atmosphere, and changes in the atmosphere affect conditions for life. As a basis for understanding this concept:</p> <p>A. Students know the thermal structure and chemical composition of the atmosphere.</p> <p>B. Students know how the composition of Earth's atmosphere has evolved over geologic time and know the effect of outgassing, the variations of carbon dioxide concentration, and the origin of atmospheric oxygen.</p> <p>C. Students know the location of the ozone layer in the upper atmosphere, its role in absorbing ultraviolet radiation, and the way in which this layer varies both naturally and in response to human activities.</p>
	<p>9-12.5(Science and Technology):</p> <p>1. Abilities of technological design</p> <p>2. Understandings about science and technology</p>	<p>Content Standard 5:</p> <p>Students, through the inquiry process, understand how scientific knowledge and technological developments impact communities, cultures and societies.</p> <p><u>Students will:</u></p> <p>3. Evaluate the ongoing, collaborative scientific process by gathering and critiquing information.</p> <p>4. Analyze benefits, limitations, costs, consequences, and ethics involved in using scientific and technological innovations (e.g., biotechnology, environmental issues)</p> <p>5. Explain how the knowledge of science and technology applies to contemporary Montana American Indian communities (e.g., natural</p>	

		resources development, management and conservation)	
	9-12.6 (Science in Personal and Social Perspectives): 4. Environmental quality 5. Natural and human-induced hazards 6. Science and technology in local, national, and global challenges		
	9-12.7(History and Nature of Science): 1. Science as a human endeavor 2. Nature of scientific knowledge 3. Historical perspectives	Content Standard 6: Students understand historical developments in science and technology. <u>Students will:</u> 1. Analyze and illustrate the historical impact of scientific and technological advances including Montana American Indian examples. 2. Trace developments that demonstrate scientific knowledge is subject to change as new evidence becomes available 3. Describe, explain and analyze science as a human endeavor and an ongoing process.	
Social Studies/History	K-12.5 Environment and Society: As a result of activities in grades K-12, all students should: A. Understand how human actions modify the physical environment. B. Understand how physical systems affect human systems. C. Understand the changes that occur in the meaning, use, distribution, and importance of resources.	Content Standard 3: Students apply geographic knowledge and skills (e.g., location, place, human/environment interactions, movement, and regions). <u>Students will:</u> 3. Assess the major impacts of human modifications on the environment (e.g., global warming, deforestation, erosion, pollution).	
		Content Standard 4: Students demonstrate an understanding of the effects of time, continuity, and change on historical and future perspectives and relationships. <u>Students will:</u> 5. Analyze both the historical impact of technology (e.g., industrialization, communication, medicine) on human values and behaviors and how technology shapes problem solving now and in the future.	World History, Culture, and Geography: The Modern World: 10.3 Students analyze the effects of the Industrial Revolution in England, France, Germany, Japan, and the United States. 2. Examine how scientific and technological changes and new forms of energy brought about massive social, economic, and cultural change
		Content Standard 6: Students demonstrate an understanding of the impact of human interaction and cultural diversity on societies. <u>Students will:</u>	

		4. Evaluate how the unique characteristics of American Indian tribes and other cultural groups have contributed to Montana’s history and contemporary life (e.g., legal and political relationships between and among tribal, state, and federal governments).	
Math	<p>Data Analysis and Probability: 9-12.1 Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer. A. understand the differences among various kinds of studies and which types of inferences can legitimately be drawn from each; B. know the characteristics of well-designed studies, including the role of randomization in surveys and experiments;</p>	<p>Content Standard 7: Students demonstrate understanding of and an ability to use patterns, relations and functions. <u>Students will:</u> 3. Analyze the effects of parameter changes on the graphs of functions and relations, including translations. 4. Model real-world phenomena with a variety of functions.</p>	<p>Probability and Statistics: 8.0 Students organize and describe distributions of data by using a number of different methods, including frequency tables, histograms, standard line and bar graphs, stem-and-leaf displays, scatterplots, and box-and-whisker plots.</p>