

Standards and Indicators: Physics

| Quarter | Standard | Indicator |
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| S1 | Force and Motion | SC12.2.2.a Describe motion with respect to displacement and acceleration |
| | | SC12.2.2.b Describe how the law of inertia (Newton's 1st law) is evident in a real-world event |
| | | SC12.2.2.c Make predictions based on relationships among net force, mass, and acceleration (Newton's 2nd law) |
| | | SC12.2.2.d Recognize that all forces occur in equal and opposite pairs (Newton's 3rd law) |
| | | SC12.2.2.e Describe how Newton's 3rd law of motion is evident in a real-world event |
| | | SC12.2.2.f Describe gravity as a force that each mass exerts on another mass, which is proportional to the masses and the distance between them |
| | | SC12.2.2.g Recognize that an attractive or repulsive electric force exists between two charged particles and that this force is proportional to the magnitude of the charges and the distance between |
| S2 | Energy | SC12.2.3.a Describe mechanical wave properties (speed, wavelength, frequency, amplitude) and how waves travel through a medium |
| | | SC12.2.3.b Recognize that the energy in waves can be changed into other forms of energy |
| | | SC12.2.3.c Recognize that light can behave as a wave (diffraction and interference) |
| | | SC12.2.3.e Compare and contrast methods of heat transfer and the interaction of heat with matter via conduction, convection, and radiation |
| | | SC12.2.3.f Recognize that the production of electromagnetic waves is a result of changes in the motion of charges or by a changing magnetic field |
| | | SC12.2.3.g Compare and contrast segments of the electromagnetic spectrum (radio, micro, infrared, visible, ultraviolet, x-rays, gamma) based on frequency and wavelength |
| | | SC12.2.3.i Interpret the law of conservation of energy to make predictions for the outcome of an event |
| | | SC12.2.3.j Identify that all energy can be considered to be either kinetic, potential, or energy contained by a field (e.g. as electromagnetic waves) |
| S2 | Earth Structures and Processes | SC12.4.2.b Describe how heat convection in the mantle propels the plates comprising the Earth's surface across the face of the globe (plate tectonics) |
| S2 | Energy in Earth's Systems | SC12.4.3.a Identify internal and external sources of heat energy in Earth's systems |
| | | SC12.4.3.b Describe how radiation, conduction, and convection transfer heat in Earth's systems |
| | | SC12.4.3.c Compare and contrast benefits of renewable and nonrenewable energy sources |
| 1, 2, 3, & 4 | Inquiry | SC12.1.1.a Formulate a testable hypothesis supported by prior knowledge to guide an investigation |
| | | SC12.1.1.b Design and conduct logical and sequential scientific investigations with repeated trials and apply findings to new investigations |
| | | SC12.1.1.c Identify and manage variables and constraints |
| | | SC12.1.1.d Select and use lab equipment and technology appropriately and accurately |

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| | | SC12.1.1.e Use tools and technology to make detailed qualitative and quantitative observations |
| | | SC12.1.1.f Represent and review collected data in a systematic, accurate, and objective manner |
| | | SC12.1.1.g Analyze and interpret data, synthesize ideas, formulate and evaluate models, and clarify concepts and explanations |
| | | SC12.1.1.h Use results to verify or refute a hypothesis |
| | | SC12.1.1.i Propose and/or evaluate possible revisions and alternate explanations |
| | | SC12.1.1.j Share information, procedures, results, conclusions, and defend findings to a scientific community (peers, science fair audience, policy makers) |
| | | SC12.1.1.k Evaluate scientific investigations and offer revisions and new ideas as appropriate |
| | | SC12.1.1.l Use appropriate mathematics in all aspects of scientific inquiry |
| 1, 2, 3, & 4 | Technology | SC12.1.3.a Propose designs and choose between alternative solutions of a problem |
| | | SC12.1.3.b Assess the limits of a technological design |
| | | SC12.1.3.c Implement the selected solution |
| | | SC12.1.3.d Evaluate the solution and its consequences |
| | | SC12.1.3.e Communicate the problem, process, and solution |
| | | SC12.1.3.f Compare and contrast the reasons for the pursuit of science and the pursuit of technology |
| | | SC12.1.3.g Explain how science advances with the introduction of new technology |
| | | SC12.1.3.h Recognize creativity, imagination, and a good knowledge base are all needed to advance the work of science and engineering |