

Physics

State Standard Number	State Standard Area/Description	Unit Name	Course Topic Description
A	Science Processes and Inquiry		
A.1	Observing is the first action taken by the learner to acquire new information about an object or event. Opportunities for observation are developed through the use of a variety of scientific tools. Measurement allows observations to be quantified. The student will accomplish these objectives to meet this process standard.		
A.1.1	Identify qualitative and quantitative changes given conditions (e.g., temperature, mass, volume, time, position, length) before, during, and after an event.		
A.1.2	Use appropriate tools (e.g., metric ruler, graduated cylinder, thermometer, balances, spring scales, stopwatches) when measuring objects and/or events.	Physics and the Laws of Motion	Free Fall Lab
A.1.3	Use appropriate System International (SI) units (i.e., grams, meters, liters, degrees Celsius, and seconds); and SI prefixes (i.e., micro-, milli-, centi-, and kilo-) when measuring objects and/or events.	Physics and the Laws of Motion	Free Fall Lab
A.2	Classifying establishes order. Objects and events are classified based on similarities, differences, and interrelationships. The student will accomplish these objectives to meet this process standard.		
A.2.1	Using observable properties, place an object or event into a classification system.		
A.2.2	Identify the properties by which a classification system is based.		
A.2.3	Graphically classify physical relationships (e.g., linear, parabolic, inverse).	Physics and the Laws of Motion	Section 2

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A.3	Experimenting is a method of discovering information. It requires making observations and measurements to test ideas. The student will accomplish these objectives to meet this process standard.		
A.3.1	Evaluate the design of a physics investigation.		
A.3.2	Identify the independent variables, dependent variables, and controls in an experiment.	Physics and the Laws of Motion	Free Fall Lab
A.3.3	Use mathematics to show relationships within a given set of observations.	Physics and the Laws of Motion	Free Fall Lab
A.3.4	Identify a hypothesis for a given problem in physics investigations.	Physics and the Laws of Motion	Free Fall Lab
A.3.5	Recognize potential hazards and practice safety procedures in all physics activities.	Physics and the Laws of Motion	Free Fall Lab
A.4	Interpreting is the process of recognizing patterns in collected data by making inferences, predictions, or conclusions. Communicating is the process of describing, recording, and reporting experimental procedures and results to others. Communication may be oral, written, or mathematical and includes		

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	organizing ideas, using appropriate vocabulary, graphs, other visual representations, and mathematical equations. The student will accomplish these objectives to meet this process standard.		
A.4.1	Select appropriate predictions based on previously observed patterns of evidence.	Physics and the Laws of Motion	Free Fall Lab
A.4.2	Report data in an appropriate manner.	Physics and the Laws of Motion	Free Fall Lab
A.4.3	Interpret data tables, line, bar, trend, and/or circle graphs.	Physics and the Laws of Motion	Section 2
A.4.4	Accept or reject hypotheses when given results of a physics investigation.	Physics and the Laws of Motion	Free Fall Lab
A.4.5	Evaluate experimental data to draw the most logical conclusion.	Physics and the Laws of Motion	Free Fall Lab
A.4.6	Prepare a written report describing the sequence, results, and interpretation of a physics investigation or event.		
A.4.7	Communicate or defend scientific thinking that resulted in conclusions.	Physics and the Laws of Motion	Free Fall Lab

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A.4.8	Identify and/or create an appropriate graph or chart from collected data, tables, or written description.	Physics and the Laws of Motion	Free Fall Lab
A.5	Modeling is the active process of forming a mental or physical representation from data, patterns, or relationships to facilitate understanding and enhance prediction. The student will accomplish these objectives to meet this process standard.		
A.5.1	Interpret a model which explains a given set of observations.	Electrostatics	Section 2
A.5.2	Select predictions based on models.	Electrostatics	Section 2
A.5.3	Compare a given model to the physical world.	Electrostatics	Section 2
A.6	Inquiry can be defined as the skills necessary to carry out the process of scientific or systemic thinking. In order for inquiry to occur, students must have the opportunity to ask a question, formulate a procedure, and observe phenomena. The student will accomplish these objectives to meet this process standard.		
A.6.1	Formulate a testable hypothesis and design an appropriate experiment relating to the physical world.	Physics and the Laws of Motion	Free Fall Lab

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A.6.2	Design and conduct physics investigations in which variables are identified and controlled.		
A.6.3	Use a variety of technologies, such as hand tools, measuring instruments, and computers to collect, analyze, and display data.		
A.6.4	Inquiries should lead to the formulation of explanations or models (physical, conceptual, and mathematical). In answering questions, students should engage in discussions (based on scientific knowledge, the use of logic, and evidence from the investigation) and arguments that encourage the revision of their explanations, leading to further inquiry.		
B	Physics		
B.1	The motion of an object can be described by its position, direction of motion, and speed. A change in motion occurs when a net force is applied. The student will engage in investigations that integrate the process and inquiry standards and lead to the discovery of the following objectives:		
B.1.1	Objects change their motion only when a net force is applied. Newton's laws of motion are used to calculate precisely the effects of forces on the motion of objects.	Physics and the Laws of Motion	Section 4
B.1.2	Gravitation is a universal force that each mass exerts on any other mass. The strength of the gravitational attractive force between two masses is proportional to the masses and		

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	inversely proportional to the square of the distance between them.		
B.1.3	The electric force is a universal force that exists between any two charged objects. The strength of the force is proportional to the charges and, as with gravitation, inversely proportional to the square of the distance between them.	Electrostatics	Section 2
B.1.4	Electricity and magnetism are two aspects of a single electromagnetic force.	Magnetism	Section 3
B.2	The total energy of the universe is constant. The student will engage in investigations that integrate the process and inquiry standards and lead to the discovery of the following objectives:		
B.2.1	Energy can be transferred but never destroyed. As these transfers occur, the matter involved becomes steadily less ordered.	Heat and Thermodynamics	Section 3
B.2.2	All energy can be considered to be kinetic energy, potential energy, or energy contained by a field.	Energy and Motion	Section 2
B.2.3	Heat consists of random motion and the vibrations of atoms, molecules, and ions. The higher the temperature, the greater the atomic or molecular motion.	Heat and Thermodynamics	Section 3
B.3	Energy (potential, kinetic and field) interacts with matter and is transferred during these interactions. The student will engage in investigations that integrate the process and inquiry standards and lead to the discovery of the following objectives:		

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B.3.1	Waves have energy and can transfer energy when they interact with matter. Sound waves and electromagnetic waves are fundamentally different.	Waves	Section 3
B.3.2	Electromagnetic waves result when a charged object is accelerated or decelerated.	Waves	Section 4