

Physical Science

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.	Energy in Motion	Motion
A.1.2	Use appropriate tools (e.g., metric ruler, graduated cylinder, thermometer, balances, spring scales, stopwatches) when measuring objects and/or events.	Energy in Motion	Lab: Gravity and Air Resistance 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.	Scientific Nature	Units of Measurement
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.	Scientific Inquiry	Classifying Data
A.2.2	Identify the properties by which a classification system is based.	Scientific Inquiry	Classifying Data
A.3	Experimenting is a method of discovering information. It requires making observations and		

Physical Science

	measurements to test ideas. The student will accomplish these objectives to meet this process standard.		
A.3.1	Evaluate the design of a physical science investigation.	Scientific Inquiry	Evaluating an Experimental Design
A.3.2	Identify the independent variables, dependent variables, and controls in an experiment.	Scientific Inquiry	Independent and Dependent Variables Constants
A.3.3	Use mathematics to show relationships within a given set of observations.	Scientific Nature	Mathematical Models
A.3.4	Identify a hypothesis for a given problem in physical science investigations.	Matter, Energy and Change	Lab: Exploring Glow Sticks
A.3.5	Recognize potential hazards and practice safety procedures in all physical science activities.	Scientific Inquiry	Safety During Investigations
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 organizing ideas, using appropriate vocabulary, graphs, other visual representations, and mathematical equations. The student will accomplish these objectives to meet this process standard.		

Physical Science

A.4.1	Select appropriate predictions based on previously observed patterns of evidence.		
A.4.2	Report data in an appropriate manner.	Scientific Inquiry	Organizing Data
A.4.3	Interpret data tables, line, bar, trend, and/or circle graphs.	Scientific Inquiry	Organizing Data
A.4.4	Accept or reject hypotheses when given results of a physical science investigation.	Scientific Inquiry	Drawing Conclusions
A.4.5	Evaluate experimental data to draw the most logical conclusion.	Scientific Inquiry	Drawing Conclusions
A.4.6	Prepare a written report describing the sequence, results, and interpretation of a physical science investigation or event.	Scientific Inquiry	Unit Project: Scientific Inquiry, Part 5
A.4.7	Communicate or defend scientific thinking that resulted in conclusions.	Scientific Inquiry	Discussion: Communicating About Your Experiment
A.4.8	Identify and/or create an appropriate graph or chart from collected data, tables, or written description.	Scientific Inquiry	Organizing Data

Physical Science

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.	Scientific Nature	Models
A.5.2	Select predictions based on models.		
A.5.3	Compare a given model to the physical world.	Scientific Nature	Models
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.	Scientific Inquiry	Unit Project: Scientific Inquiry
A.6.2	Design and conduct physical science investigations in which variables are identified and controlled.	Scientific Inquiry	Unit Project: Scientific Inquiry

Physical Science

A.6.3	Use a variety of technologies, such as hand tools, measuring instruments, and computers to collect, analyze, and display data.	Scientific Inquiry	Unit Project: Scientific Inquiry
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.	Scientific Inquiry	Discussion: Communicating About Your Experiment
B	Physical Science		
B.1	All matter is made up of atoms. Its structure is made up of repeating patterns and has characteristic properties. The student will engage in investigations that integrate the process standards and lead to the discovery of the following objectives:		
B.1.1	Matter is made up of minute particles called atoms, and atoms are composed of even smaller components (i.e., protons, neutrons, and electrons).		
B.1.2	An element is composed of a single type of atoms. When elements are listed in order according to the number of protons (called the atomic number), repeating patterns of physical and chemical properties identify families of elements with similar properties.	Elements, Compounds and Mixtures	Atomic Theory

Physical Science

B.1.3	Matter has characteristic properties, such as boiling points, melting points, and density, which distinguish pure substances and can be used to separate one substance from another.	Matter, Energy and Change Elements, Compounds and Mixtures	The Properties of Matter Separating Mixtures
B.2	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 standards and lead to the discovery of the following objectives:		
B.2.1	Objects change their motion only when a net force is applied. Laws of motion are used to determine the effects of forces on the motion of objects.	Energy in Motion	Newton's Laws of Motion
B.2.2	Gravitation is a universal force that each mass exerts on any other mass.	Energy in Motion	Forces and the Force of Gravity
B.3	Energy, such as potential, kinetic, and field, interacts with matter and is transferred during these interactions. The student will engage in investigations that integrate the process standards and lead to the discovery of the following objectives:		
B.3.1	All energy can be considered to be either kinetic energy, which is the energy of motion; potential energy, which depends on relative position; or energy contained by a field, such as electromagnetic waves.	Matter, Energy and Change	What is Energy?
B.3.2	Waves, including sounds and seismic waves, waves on water, and light waves, have energy and can transfer energy when they interact with matter (such as used in telescopes, solar power, and telecommunication technology).	Waves	What is a Wave?

Physical Science

B.4	A system that has changed over time, which includes dynamic changes in the earth’s crust, is the Earth system. The student will engage in investigations that integrate the process standards and lead to the discovery of the following objectives:		
B.4.1	Geologic time can be estimated by observing rock sequences and using fossils to correlate the sequences at various locations.		
B.4.2	The solid crust of the earth consists of separate plates that move very slowly pressing against one another in some places and pulling apart in other places (i.e., volcanoes, earthquakes and mountain building).		
B.5	The universe is an ever-changing system of matter and energy that exists now, in the past, and in the future. The student will engage in investigations that integrate the process standards and lead to the discovery of the following objectives:		
B.5.1	The stars differ from each other in size, temperature, and age, but they appear to be made up of the same elements that are found on the earth.	The Universe	Life Cycle of Stars
B.5.2	All stars have a life cycle including birth, development, and death. Fusion reactions in stars release great amounts of energy and matter over millions of years.	The Universe	Life Cycle of Stars