Science
Standards and Benchmarks
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	Standard 1 Inquiry	Standard 2 Physical Science	Standard 3 Life Science	Standard 4 Earth Science	
6	**1.1 Understands the nature of scientific knowledge** • Knows that an experiment must be repeated many times and yield consistent results before the results can be proven **1.2 Understands the nature of scientific inquiry** • Conducts a scientific investigation • Can analyze and interpret scientific data • **1.3 Understands the scientific enterprise** • Knows various settings in which scientists may work**(CE)**	**2.1 Understands the structure and properties of matter** • Knows that matter is made up of tiny particles called atoms **2.2 Understands the sources and properties of energy** • Knows that energy is a property of many substances **2.3 Understands forces and motion** • Knows an object that is subjected to a force will continue to move at a constant and in a straight line, unless another force is applied	**3.1 Understands the principles of heredity and related concepts** • Knows that hereditary information is contained in genes**(MCGF)** **3.2 Understands the structure and functions of cells and organisms** • Knows the levels of organization in living systems including cells, tissue, organs, organ systems **3.3 Understands relationships among organisms and their physical environments** • Knows how energy is transferred through food webs in an ecosystem **3.4 Understands biological evolution and the diversity of life** • Understands the concept of extinction and its importance in biological evolution	**4.1 Understands earth's composition and structure** • Knows that the Earth is comprised of layers**(GE)** • Knows that Earth's crust is divided into plates that move at extremely slow rates**(GE)** **4.2 Understands the composition and structure of the universe and the earth's place in it.** • Knows characteristics and movement patterns of the planets in our solar system**(GE)** **4.3 Understands atmospheric processes and the water cycle** • Knows the composition of the Earth's atmosphere	

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	Standard 1 Inquiry	Standard 2 Physical Science	Standard 3 Life Science	Standard 4 Earth Science	
7	**1.1 Understands the nature of scientific knowledge** • Knows that an experiment must be repeated many times and yield consistent results before the results can be proven **1.2 Understands the nature of scientific inquiry** • Designs and conducts a scientific investigation • Can analyze and interpret scientific data • **1.3 Understands the scientific enterprise** • Knows various settings in which scientists may work**(CE)**	**2.1 Understands the structure and properties of matter** • Knows that matter is made up of tiny particles called atoms **2.2 Understands the sources and properties of energy** **2.3 Understands forces and motion**	**3.1 Understands the principles of heredity and related concepts** • Knows that reproduction is a trait of all living things **3.2 Understands the structure and functions of cells and organisms** • Knows that multi-cellular organisms have a variety of specialized cells • Knows that human characteristics can be described in terms of traits**(MCGF)** **3.3 Understands relationships among organisms and their physical environments** • Knows ways in which organisms interact and depend on one another • Knows that all individuals of a species existing together at a given place and time make up a population**(GE)** **3.4 Understands biological evolution and the diversity of life** • Knows the basic ideas related to biological evolution	**4.1 Understands earth's composition and structure** **4.2 Understands the composition and structure of the universe and the earth's place in it.** **4.3 Understands atmospheric processes and the water cycle**	

			• Knows ways in which organisms can be classified		

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	Standard 1 Inquiry	Standard 2 Physical Science	Standard 3 Life Science	Standard 4 Earth Science	
8	**1.1 Understands the nature of scientific knowledge** • Knows that an experiment must be repeated many times and yield consistent results before the results are proven **1.2 Understands the nature of scientific inquiry** • Designs and conducts a scientific investigation • Can analyze and interpret scientific data **1.3 Understands the scientific enterprise** • Knows various settings in which scientists may work**(CE)**	**2.1 Understands the structure and properties of matter** • Knows that atoms often combine to form a molecule (crystal) **2.2 Understands the sources and properties of energy** • Knows how the sun acts as a major source of energy for changes on the earth's surface **2.3 Understands forces and motion** • Understands general concepts related to gravitational force	**3.1 Understands the principles of heredity and related concepts** **3.2 Understands the structure and functions of cells and organisms** **3.3 Understands relationships among organisms and their physical environments** **3.4 Understands biological evolution and the diversity of life** • Knows that the fossil record through geologic evidence documents the appearance and diversity of many life forms	**4.1 Understands earth's composition and structure** • Knows how land forms are created through a combination of constructive and destructive forces **4.2 Understands the composition and structure of the universe and the earth's place in it.** • Knows the characteristics of the sun and its position in the universe**(GE)** • Knows characteristics and movement patterns of the sun, Earth, moon, comets, asteroids, and meteors**(GE)** **4.3 Understands atmospheric processes and the water cycle** • Knows factors that can impact Earth's climate	

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	Standard 1 Inquiry	Standard 2 Physical Science	Standard 3 Life Science	Standard 4 Earth Science	
9	**1.1 Understands the nature of scientific knowledge** • Knows that scientific explanations must meet certain criteria to be considered valid **1.2 Understands the nature of scientific inquiry** • Designs and conducts scientific investigations • Can analyze and interpret scientific data **1.3 Understands the scientific enterprise** • Understands that individuals and teams contribute to science at different levels**(MCGF)**	**2.1 Understands the structure and properties of matter** • Knows the structure of the atom • Understands how elements are arranged in the periodic table **2.2 Understands the sources and properties of energy** • Understands the relationship between heat and temperature **2.3 Understands forces and motion** • Knows how different kinds of materials respond to electric forces • Knows forces can cause motion • Knows the law of conservation of matter and energy			

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	Standard 1 Inquiry	Standard 2 Physical Science	Standard 3 Life Science	Standard 4 Earth Science	
10	**1.1 Understands the nature of scientific knowledge** • Knows that scientific explanations must meet certain criteria to be considered valid **1.2 Understands the nature of scientific inquiry** • Uses tools to perform accurate investigations and communications • Can analyze and interpret scientific data **1.3 Understands the scientific enterprise** • Understands that science involves different types of work in may different disciplines**(CE)**	**2.1 Understands the structure and properties of matter** • Knows that atoms may be bonded together into molecules • Knows that the number of electrons determine how the atom is charged **2.2 Understands the sources and properties of energy** • Understands the relationship between heat and temperature **2.3 Understands forces and motion** • Knows that electromagnetic forces exist within and between atoms	**3.1 Understands the principles of heredity and related concepts** • Knows the chemical and structural properties of DNA **3.2 Understands the structure and functions of cells and organisms** • Knows the structure of different types of cell parts • Understands the process of cell division and differentiation **3.3 Understands relationships among organisms and their physical environments** • Knows that matter and energy flow through different levels of organization in living systems **3.4 Understands biological evolution and the diversity of life** • Understands the concept of natural selection • Knows how organisms are classified into groups and subgroups based on similarities of evolutionary relationships	**4.1 Understands earth's composition and structure** **4.2 Understands the composition and structure of the universe and the earth's place in it.** **4.3 Understands atmospheric processes and the water cycle** • Knows how the evolution of life on Earth has changed the composition of the Earth's atmosphere**(GE)**	

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	Standard 1 Inquiry	Standard 2 Physical Science	Standard 3 Life Science	Standard 4 Earth Science	
Course-Anatomy	**1.1 Understands the nature of scientific knowledge** • Understands how scientific knowledge changes and accumulates over time **1.2 Understands the nature of scientific inquiry** • Uses tools to perform accurate scientific investigations and communications **(CE)** • Can analyze and interpret scientific data **1.3 Understands the scientific enterprise** • Understands that individuals and teams work together at different levels		**3.1 Understands the principles of heredity and related concepts** • Knows the chemical and structural properties of DNA • Knows ways in which genes may be altered and combined to create species **3.2 Understands the structure and functions of cells and organisms** • Knows the structure of difference cell parts • Understands the chemical reactions involved in cell functions • Knows the complexity and organization of the human body **3.4 Understands biological evolution and the diversity of life** • Knows that biochemical characteristics are heritable and determine anatomy, behavior, reproduction and survival or organisms.		

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	Standard 1 Inquiry	Standard 2 Physical Science	Standard 3 Life Science	Standard 4 Earth Science	
Course Environ-mental Science	**1.1 Understands the nature of scientific knowledge** • Knows that from time to time major shifts occur in a scientific view of how the world works**(GE)** **1.2 Understands the nature of scientific inquiry** • Designs and conducts scientific investigations • Can analyze and interpret scientific data **1.3 Understands the scientific enterprise** • Knows that science and technology are essential social enterprises, but alone they can only indicate		**3.1 Understands the principles of heredity and related concepts** • Knows that mutations and new gene combinations may have positive, negative, or no affects on the organism **3.2 Understands the structure and functions of cells and organisms** • Understands the process of photosynthesis and respiration in plants **3.3 Understands relationships among organisms and their physical environments** • Knows ways in which humans can alter the equilibrium of ecosystems**(GE)** • Knows how the amount of life an environment can support is limited by the availability of matter and the ecosystem's ability to recycle materials • Knows how the interrelationships and	**4.1 Understands earth's composition and structure** • Knows the conditions of Earth that enable it to support life **4.2 Understands the composition and structure of the universe and the earth's place in it.** **4.3 Understands atmospheric processes and the water cycle** • Knows how winds and ocean currents are produced on the Earth's surface • Knows the major external and internal sources of energy on Earth • Knows how the evolution of life on Earth has changed the composition of the Earth's atmosphere**(GE)**	

	what or what should or should not happen**(MCGF)** • Knows that creativity, imagination, and a good knowledge base are all required in the work of science		interdependencies among organisms generate stable ecosystems **<u>3.4 Understands biological evolution and the diversity of life</u>** • Understands the concept of natural selection • Knows how variations of organisms within a species increases the chance of survival of the species		

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	Standard 1 Inquiry	Standard 2 Physical Science	Standard 3 Life Science	Standard 4 Earth Science	
Course-Accel-erated Biology	**1.1 Understands the nature of scientific knowledge** • Knows that major shifts occur in the scientific view of how the world works**(GE)** **1.2 Understands the nature of scientific inquiry** • Designs and conducts scientific investigations • Uses technology to perform accurate scientific investigations • Can analyze and interpret scientific data **1.3 Understands the scientific enterprise** • Understands that science involves work in many disciplines**(CE)**		**3.1 Understands the principles of heredity and related concepts** • Knows the chemical and structural properties of DNA **3.2 Understands the structure and functions of cells and organisms** • Understands the process of photosynthesis and respiration of plants • Knows how cell functions are regulated through changes in activities **3.3 Understands relationships among organisms and their physical environments** • Knows how interrelationships and interdependencies among organisms generate stable ecosystems **3.4 Understands biological evolution and the diversity of life** • Knows the history of the origin and evolution of life • Knows how variations of organisms within a species increases the chance of survival of the species.		

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	Standard 1 Inquiry	Standard 2 Physical Science	Standard 3 Life Science	Standard 4 Earth Science	
Course Chemistry	**1.1 Understands the nature of scientific knowledge** • Knows that valid scientific explanations must meet certain criteria **1.2 Understands the nature of scientific inquiry** • Understands the use of hypotheses in science • Designs and conducts scientific investigations • Can analyze and interpret scientific data **1.3 Understands the scientific enterprise** • Understands that individuals and teams contribute to science at different	**2.1 Understands the structure and properties of matter** • Understands that chemical reactions release or consume energy • Knows that chemical reactions can take place at vastly different rates • Knows that chemical reactions can be accelerated by catalysts • Understands the electron structure in the atoms as related to quantum numbers **2.2 Understands the sources and properties of energy** • Knows that all energy can be considered to be kinetic or potential			

	levels**(MCGF)**				

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	Standard 1 Inquiry	Standard 2 Physical Science	Standard 3 Life Science	Standard 4 Earth Science	
COURSE **Physics**	**1.1 Understands the nature of scientific knowledge** • **K**nows that valid scientific explanations must meet certain criteria **1.2 Understands the nature of scientific inquiry** • Understands the use of hypotheses in science • Uses technology and mathematics to perform valid scientific investigations **(CE)** • Can analyze and interpret scientific data **1.3 Understands the scientific enterprise** • Understands that individuals and teams contribute to science at different	**2.1 Understands the structure and properties of matter** **2.2 Understands the sources and properties of energy** • Understands the concept of kinetic energy • Understands the concept of potential energy **2.3 Understands forces and motion** • Knows that laws of motion can be used to determine the effects of forces on the motion of objects • Understands momentum and conservation of momentum • Understands the law of conservation of matter and energy			

	levels**(MCGF)**				