Science
Grade Level Expectations at a Glance

Standard	Grade Level Expectation
High School	
1. Physical Science	1. Newton's laws of motion and gravitation describe the relationships among forces acting on and between objects, their masses, and changes in their motion – but have limitations 2. Matter has definite structure that determines characteristic physical and chemical properties 3. Matter can change form through chemical or nuclear reactions abiding by the laws of conservation of mass and energy 4. Atoms bond in different ways to form molecules and compounds that have definite properties 5. Energy exists in many forms such as mechanical, chemical, electrical, radiant, thermal, and nuclear, that can be quantified and experimentally determined 6. When energy changes form, it is neither created not destroyed; however, because some is necessarily lost as heat, the amount of energy available to do work decreases
2. Life Science	1. Matter tends to be cycled within an ecosystem, while energy is transformed and eventually exits an ecosystem 2. The size and persistence of populations depend on their interactions with each other and on the abiotic factors in an ecosystem 3. Cellular metabolic activities are carried out by biomolecules produced by organisms 4. The energy for life primarily derives from the interrelated processes of photosynthesis and cellular respiration. Photosynthesis transforms the sun's light energy into the chemical energy of molecular bonds. Cellular respiration allows cells to utilize chemical energy when these bonds are broken. 5. Cells use the passive and active transport of substances across membranes to maintain relatively stable intracellular environments 6. Cells, tissues, organs, and organ systems maintain relatively stable internal environments, even in the face of changing external environments 7. Physical and behavioral characteristics of an organism are influenced to varying degrees by heritable genes, many of which encode instructions for the production of proteins 8. Multicellularity makes possible a division of labor at the cellular level through the expression of select genes, but not the entire genome 9. Evolution occurs as the heritable characteristics of populations change across generations and can lead populations to become better adapted to their environment

Science
Grade Level Expectations at a Glance

Standard	Grade Level Expectation
High School (continued)	
3. Earth Systems Science	1. The history of the universe, solar system and Earth can be inferred from evidence left from past events 2. As part of the solar system, Earth interacts with various extraterrestrial forces and energies such as gravity, solar phenomena, electromagnetic radiation, and impact events that influence the planet's geosphere, atmosphere, and biosphere in a variety of ways 3. The theory of plate tectonics helps to explain geological, physical, and geographical features of Earth 4. Climate is the result of energy transfer among interactions of the atmosphere, hydrosphere, geosphere, and biosphere 5. There are costs, benefits, and consequences of exploration, development, and consumption of renewable and nonrenewable resources 6. The interaction of Earth's surface with water, air, gravity, and biological activity causes physical and chemical changes 7. Natural hazards have local, national and global impacts such as volcanoes, earthquakes, tsunamis, hurricanes, and thunderstorms
Eighth Grade	
1. Physical Science	1. Identify and calculate the direction and magnitude of forces that act on an object, and explain the results in the object's change of motion 2. There are different forms of energy, and those forms of energy can be changed from one form to another – but total energy is conserved 3. Distinguish between physical and chemical changes, noting that mass is conserved during any change 4. Recognize that waves such as electromagnetic, sound, seismic, and water have common characteristics and unique properties
2. Life Science	1. Human activities can deliberately or inadvertently alter ecosystems and their resiliency 2. Organisms reproduce and transmit genetic information (genes) to offspring, which influences individuals' traits in the next generation
3. Earth Systems Science	1. Weather is a result of complex interactions of Earth's atmosphere, land and water, that are driven by energy from the sun, and can be predicted and described through complex models 2. Earth has a variety of climates defined by average temperature, precipitation, humidity, air pressure, and wind that have changed over time in a particular location 3. The solar system is comprised of various objects that orbit the Sun and are classified based on their characteristics 4. The relative positions and motions of Earth, Moon, and Sun can be used to explain observable effects such as seasons, eclipses, and Moon phases

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Standard	Grade Level Expectation
Seventh Grade	
1. Physical Science	1. Mixtures of substances can be separated based on their properties such as solubility, boiling points, magnetic properties, and densities
2. Life Science	1. Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment 2. The human body is composed of atoms, molecules, cells, tissues, organs, and organ systems that have specific functions and interactions 3. Cells are the smallest unit of life that can function independently and perform all the necessary functions of life 4. Photosynthesis and cellular respiration are important processes by which energy is acquired and utilized by organisms 5. Multiple lines of evidence show the evolution of organisms over geologic time
3. Earth Systems Science	1. Major geologic events such as earthquakes, volcanic eruptions, mid-ocean ridges, and mountain formation are associated with plate boundaries and attributed to plate motions 2. Geologic time, history, and changing life forms are indicated by fossils and successive sedimentation, folding, faulting, and uplifting of layers of sedimentary rock
Sixth Grade	
1. Physical Science	1. All matter is made of atoms, which are far too small to see directly through a light microscope. Elements have unique atoms and thus, unique properties. Atoms themselves are made of even smaller particles 2. Atoms may stick together in well-defined molecules or be packed together in large arrangements. Different arrangements of atoms into groups compose all substances. 3. The physical characteristics and changes of solid, liquid, and gas states can be explained using the particulate model 4. Distinguish among, explain, and apply the relationships among mass, weight, volume, and density
2. Life Science	1. Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species 2. Organisms interact with each other and their environment in various ways that create a flow of energy and cycling of matter in an ecosystem
3. Earth Systems Science	1. Complex interrelationships exist between Earth's structure and natural processes that over time are both constructive and destructive 2. Water on Earth is distributed and circulated through oceans, glaciers, rivers, ground water, and the atmosphere 3. Earth's natural resources provide the foundation for human society's physical needs. Many natural resources are nonrenewable on human timescales, while others can be renewed or recycled

Science
Grade Level Expectations at a Glance

Standard	Grade Level Expectation
Fifth Grade	
1. Physical Science	1. Mixtures of matter can be separated regardless of how they were created; all weight and mass of the mixture are the same as the sum of weight and mass of its parts
2. Life Science	1. All organisms have structures and systems with separate functions 2. Human body systems have basic structures, functions, and needs
3. Earth Systems Science	1. Earth and sun provide a diversity of renewable and nonrenewable resources 2. Earth's surface changes constantly through a variety of processes and forces 3. Weather conditions change because of the uneven heating of Earth's surface by the Sun's energy. Weather changes are measured by differences in temperature, air pressure, wind and water in the atmosphere and type of precipitation
Fourth Grade	
1. Physical Science	1. Energy comes in many forms such as light, heat, sound, magnetic, chemical, and electrical
2. Life Science	1. All living things share similar characteristics, but they also have differences that can be described and classified 2. Comparing fossils to each other or to living organisms reveals features of prehistoric environments and provides information about organisms today 3. There is interaction and interdependence between and among living and nonliving components of systems
3. Earth Systems Science	1. Earth is part of the solar system, which includes the Sun, Moon, and other bodies that orbit the Sun in predictable patterns that lead to observable paths of objects in the sky as seen from Earth
Third Grade	
1. Physical Science	1. Matter exists in different states such as solids, liquids, and gases and can change from one state to another by heating and cooling
2. Life Science	1. The duration and timing of life cycle events such as reproduction and longevity vary across organisms and species
3. Earth Systems Science	1. Earth's materials can be broken down and/or combined into different materials such as rocks, minerals, rock cycle, formation of soil, and sand – some of which are usable resources for human activity
Second Grade	
1. Physical Science	1. Changes in speed or direction of motion are caused by forces such as pushes and pulls.
2. Life Science	1. Organisms depend on their habitat's nonliving parts to satisfy their needs 2. Each plant or animal has different structures or behaviors that serve different functions
3. Earth Systems Science	1. Weather and the changing seasons impact the environment and organisms such as humans, plants, and other animals

Science
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Standard	Grade Level Expectation
First Grade	
1. Physical Science	1. Solids and liquids have unique properties that distinguish them
2. Life Science	1. Offspring have characteristics that are similar to but not exactly like their parents' characteristics 2. An organism is a living thing that has physical characteristics to help it survive
3. Earth Systems Science	1. Earth's materials can be compared and classified based on their properties
Kindergarten	
1. Physical Science	1. Objects can move in a variety of ways that can be described by speed and direction 2. Objects can be sorted by physical properties, which can be observed and measured
2. Life Science	1. Organisms can be described and sorted by their physical characteristics
3. Earth Systems Science	1. The sun provides heat and light to Earth
Preschool	
1. Physical Science	1. Objects have properties and characteristics 2. There are cause-and-effect relationships in everyday experiences
2. Life Science	1. Living things have characteristics and basic needs 2. Living things develop in predictable patterns
3. Earth Systems Science	1. Earth's materials have properties and characteristics that affect how we use those materials 2. Events such as night, day, the movement of objects in the sky, weather, and seasons have patterns