A **Kindergarten** student in the Littleton Public Schools will engage with the following big ideas in **Science:**

21st Century Skills

Critical Thinking

Information Literacy

Invention

Collaboration

Self Direction

- Observe, investigate, and describe how objects can move in a variety of ways that can be described by speed and direction.
- Explain how objects can be sorted by physical properties, which can be observed and measured
- Explain how organisms can be described and sorted by their physical characteristics
- Investigate, explain, and describe that the Sun provides heat and light to Earth and the impact of that heat and light

Link to Additional Resource:

Colorado Academic Standards

A **First Grade** student in the Littleton Public Schools will engage with the following big ideas in **Science:**

21st Century Skills

Critical Thinking

Information Literacy

Invention

Collaboration

Self Direction

- Understand that solids and liquids have unique properties that distinguish them
- Understand that offspring have characteristics that are similar to but not exactly like their parents' characteristics
- Identify, observe, and analyze that an organism is a living thing that has physical characteristics to help it survive
- Understand that Earth's materials can be compared and classified based on their properties

Link to Additional Resource:

Colorado Academic Standards

A **Second Grade** student in the Littleton Public Schools will engage with the following big ideas in **Science:**

21st Century Skills

Critical Thinking

Information Literacy

Invention

Collaboration

Self Direction

- Identify, predict, and analyze how changes in speed or direction of motion are caused by forces such as pushes and pulls
- Explain and analyze how organisms depend on their habitat's nonliving parts to satisfy their needs
- Explain and analyze how each plant or animal has different structures or behaviors that serve different functions
- Develop a scientific explanation and analyze how weather and the changing seasons impact the environment and organisms such as humans, plants, and other animals

Link to Additional Resource:

Colorado Academic Standards

	A **Third Grade** student in the Littleton Public Schools will engage with the following big ideas in **Science:**
21st Century Skills **Critical Thinking** **Information Literacy** **Invention** **Collaboration** **Self Direction**	• Explain and analyze how matter exists in different states such as solids, liquids, and gases and can change from one state to another by heating and cooling • Use evidence and data to analyze how the duration and timing of life cycle events such as reproduction and longevity vary across organisms and species • Understand that 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
	Link to Additional Resource: Colorado Academic Standards

A **Fourth Grade** student in the Littleton Public Schools will engage with the following big ideas in **Science:**

21st Century Skills

Critical Thinking

Information Literacy

Invention

Collaboration

Self Direction

- Identify and understand that energy comes in many forms such as light, heat, sound, magnetic, chemical, and electrical
- Describe and classify why all living things share similar and different characteristics
- Compare fossils to each other or to living organisms to reveal features of prehistoric environments and provide information about organisms today
- Explain the interaction and interdependence between and among living and nonliving components of ecosystems
- Investigate how 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

Link to Additional Resource:

Colorado Academic Standards

A **Fifth Grade** student in the Littleton Public Schools will engage with the following big ideas in **Science:**

21st Century Skills

Critical Thinking

Information Literacy

Invention

Collaboration

Self Direction

- Understand that 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
- Explain and analyze why all organisms have structures and systems with separate functions
- Explain and evaluate why human body systems have basic structures, functions, and needs
- Understand that the Earth and Sun provide a diversity of renewable and nonrenewable resources
- Identify and analyze the ways the Earth's surface changes constantly through a variety of processes and forces
- Explain how 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

Link to Additional Resource:

Colorado Academic Standards

A **Sixth Grade** student in the Littleton Public Schools will engage with the following big ideas in **Science:**

21st Century Skills

Critical Thinking

Information Literacy

Invention

Collaboration

Self Direction

- Understand that 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.
- Understand that atoms may stick together in well-defined molecules or be packed together in large arrangements. Different arrangements of atoms into groups compose all substances.
- Use the particulate model to explain the physical characteristics and changes of solid, liquid, and gas states
- Distinguish among, explain, and apply the relationships among mass, weight, volume, and density.
- Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species.
- Understand that organisms interact with each other and their environment in various ways that create a flow of energy and cycling of matter in an ecosystem.
- Explain the complex interrelationships between Earth's structure and natural processes that over time are both constructive and destructive.
- Describe how water on Earth is distributed and circulated through oceans, glaciers, rivers, ground water, and the atmosphere.
- Recognize and describe how 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.

Link to Additional Resource:

Colorado Academic Standards

A **Seventh Grade** student in the Littleton Public Schools will engage with the following big ideas in **Science:**

21st Century Skills

Critical Thinking

Information Literacy

Invention

Collaboration

Self Direction

- Understand that mixtures of substances can be separated based on their properties such as solubility, boiling points, magnetic properties, and densities
- Explain why individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment
- Recognize, identify, and evaluate how and why the human body is composed of atoms, molecules, cells, tissues, organs, and organ systems that have specific functions and interactions
- Understand and explain that cells are the smallest unit of life that can function independently and perform all the necessary functions of life
- Recognize that photosynthesis and cellular respiration are important processes by which energy is acquired and utilized by organisms
- Interpret, analyze, and critique multiple lines of evidence that show the evolution of organisms over geologic time
- Analyze and explain how major geologic events such as earthquakes, volcanic eruptions, mid-ocean ridges, and mountain formation are associated with plate boundaries and attributed to plate motions
- Identify and explain how geologic time, history, and changing life forms are indicated by fossils and successive sedimentation, folding, faulting, and uplifting of layers of sedimentary rock

Link to Additional Resource:

Colorado Academic Standards

An **Eighth Grade** student in the Littleton Public Schools will engage with the following big ideas in **Science:**

21st Century Skills

Critical Thinking

Information Literacy

Invention

Collaboration

Self Direction

- 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
- Describe the different forms of energy, and how those forms of energy can be changed from one form to another – but total energy is conserved
- Distinguish between physical and chemical changes, noting that mass is conserved during any change
- Recognize that waves such as electromagnetic, sound, seismic, and water have common characteristics and unique properties
- Evaluate and analyze how human activities can deliberately or inadvertently alter ecosystems and their resiliency
- Recognize that organisms reproduce and transmit genetic information (genes) to offspring, which influences individuals' traits in the next generation
- Understand 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
- Research and investigate how Earth's variety of climates are defined by average temperature, precipitation, humidity, air pressure, and wind that have changed over time in a particular location
- Describe and explain the solar system which is comprised of various objects that orbit the Sun and are classified based on their characteristics
- Use the relative positions and motions of Earth, Moon, and Sun to explain observable effects such as seasons, eclipses, and Moon phases

Link to Additional Resource:

Colorado Academic Standards