

Grade: 7th Grade
Course: Science
Year: 2019-2020



Mission Statement

In partnership with our families and community, Lakewood City Schools will develop responsible citizens, who are critical and creative thinkers, committed to life-long learning, invested in a diverse society, and prepared for technological and global opportunities.

Thinking Skills The student demonstrates:

1. Critical Thinking Skills include the ability to analyze, criticize, advocate ideas, reason inductively and deductively, and to reach factual and judgemental conclusions.
2. Creative Problem Solving by identifying and analyzing a problem, thinking divergently and evaluating the implementation of possible solutions.
3. Research skills by compiling, evaluating and presenting data.
4. Communication Skills

Suggested Pacing	Content Standards	Learning and Performance Expectations	Vocabulary	Assessment of Learning Options	Learning Resources Options
~2 weeks (10 days)	7.ESS.1: The water cycle involves the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.	<p>“I can..”</p> <ul style="list-style-type: none"> ● Identify and describe the ‘spheres’ of the Earth, including lithosphere, biosphere, hydrosphere, and atmosphere. ● Describe how water moves through the geospheres (water cycle). ● Identify how water can transfer from different states. ● Describe the relationship between water, energy, and weather. ● Identify factors that affect water flow. ● Explain how the movement of water can bring positive or negative impacts by moving 	Atmosphere Hydrosphere Geosphere Biosphere Lithosphere precipitation transpiration sublimation Condensation melt Freeze evaporation	Tests Quizzes Labs Virtual labs Projects Bellwork Experiments Field Trips	

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		<p>nutrients or pollutants.</p> <ul style="list-style-type: none"> The flow of water is influenced by geographic and topographic landforms. 			
~12 weeks (10 days)	7.ESS.2: Thermal energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.	<p>“I can..”</p> <ul style="list-style-type: none"> Describe how energy is a major source of wind, air, and ocean currents. Identify major air and ocean currents (ex: Jet Stream and Gulf Stream). Describe how large bodies of water influence weather and climates. Explain why currents move due to their density, pressure, composition, and topographic, geographic influences. Interpret the data on a climograph. Analyze current and climate patterns using “realtime” global data. 	<p>Climate Weather Climograph Gulf stream Jet stream Thermal Energy</p>	<p>Tests Quizzes Labs Virtual labs Projects Bellwork Experiments Field Trips</p>	
~23 weeks (15 days)	7.ESS.3: The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.	<p>“I can..”</p> <ul style="list-style-type: none"> Describe the composition (gases) and properties (density and temperature) of Earth’s atmosphere. Describe the movement of carbon through Earth’s systems (carbon cycle). Describe the movement of 	<p>Ozone Altitude Troposphere Stratosphere Mesosphere Ionosphere Thermosphere Exosphere Carbon Cycle</p>	<p>Tests Quizzes Labs Virtual labs Projects Bellwork Experiments Field Trips</p>	

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		nitrogen through Earth's systems (nitrogen cycle).	Nitrogen Cycle		
~4 weeks (20 days)	7.ESS.4: The relative patterns of motion and positions of Earth, moon and sun cause solar and lunar eclipses, tides, and phases of the moon.	<p>"I can.."</p> <ul style="list-style-type: none"> ● Explain the difference between rotation and revolution. ● Explain the interaction between the earth, moon, and sun cause predictable changes on earth (phases of the moon, tides, eclipses). ● Explain how the relative positions of the earth, moon, and sun create moon phases. ● Explain Earth Moon Sun positions during a solar and lunar eclipse. ● Explain the positions and gravitational forces between Earth, moon, and sun systems affect tides (daily, spring, and neap). ● Construct a model that represents the positions of the Earth, moon, and sun during the eight moon phases. 	Solar eclipse Lunar eclipse Neap Tide Spring Tide High and Low Tide Rotation Revolution Eclipse (solar, lunar) Lunar phase	Tests Quizzes Labs Virtual labs Projects Bellwork Experiments Field Trips	
~1 week (5 days)	<p>To begin year 2020</p> 7.ESS.5: The relative positions of Earth and the sun cause patterns we call seasons.	<p>"I can.."</p> <ul style="list-style-type: none"> ● Identify Earth's main source of energy (the sun). ● Summarize how the amount of energy Earth receives from the sun is directly related to the angle the sunlight hits Earth. 	Solstice Equinox Equator Tropic of Cancer Tropic of Capricorn Arctic Circle	Tests Quizzes Labs Virtual labs Projects Bellwork Experiments	

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		<ul style="list-style-type: none"> Explore how seasonal changes can create specific weather patterns in different regions around the world (ex: monsoon season, hurricane season). Describe positions during solstices and equinoxes. Describe Earth's position to the sun in both hemispheres causing the four seasons. 	Antarctic Circle Angle of altitude	Field Trips	
~2 weeks (10 days)	7.PS.1: Elements can be organized by properties.	"I can.." <ul style="list-style-type: none"> Categorize elements as metal, nonmetal, or metalloid according to its location on the periodic table. Describe the properties of metals (generally hard, lustrous, malleable, and conductive, with high melting points; ex. Aluminum, Gold) Describe the properties of nonmetals (tend to be poor conductors, and are often gases at room temperature. They tend to be dull and brittle; Ex. Hydrogen, oxygen) Describe the properties of metalloids (generally semiconductive and can share properties of both metals and nonmetals; ex. Silicon, boron) 	Element Periodic Table of Element Color Solubility Hardness Density Conductivity Melting/Boiling points Viscosity Malleability Metal Nonmetal Metalloid	Tests Quizzes Labs Virtual labs Projects Bellwork Experiments Field Trips	

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		<ul style="list-style-type: none"> Predict the element's properties according to its location on the periodic table. 			
~2 weeks (10 days)	<p>To begin year 2020 7.PS.2: Matter can be separated or changed, but in a closed system, the number and types of atoms remains constant.</p>	<p>"I can.."</p> <ul style="list-style-type: none"> Summarize that an element is determined by the number of protons in an atom's nucleus. Understand that atoms can lose or gain electrons (ions) or gain neutrons (isotopes). Define an atom as the smallest unit of matter that retains its properties. Explain how properties can change when two or more atoms bond chemically. Identify compounds according to the composition of atoms. Create compounds using a predictable ratio of elements. Explain how molecules are the combination of two or more atoms combined chemically. Show how some molecules are compounds (like H₂O) while others are just considered elements (like O₂) Describe how all particles of a pure substance have a similar mass. 	Atom Element Bond Compound Molecules Law of Conservations of Mass Open System vs. Closed System Exothermic Reaction Endothermic Reaction Mixture Mixture: Solution Mixture: Suspensions Mixture: Colloids	Tests Quizzes Labs Virtual labs Projects Bellwork Experiments Field Trips	

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		<ul style="list-style-type: none">● Demonstrate how each element and compound have properties that are retained no matter their amount.● Show that matter cannot be created or destroyed, just rearranged. (Emphasize that mass is conserved)● Connect the law of conservation of mass with chemical equations (count atoms before and after, etc.)● Describe how it takes energy to break bonds between atoms.● Describe how when bonds between atoms are created, energy is released.● Explain that an exothermic chemical reaction releases more energy than is input● Explain that an endothermic chemical reaction releases less energy than is input● Identify that mixtures are composed of two or more substances that retain their separate compositions (physically and chemically).			
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		<ul style="list-style-type: none"> Identify types of mixtures: solutions, suspensions, and colloids 			
2 weeks (10 days)	7.PS.3: Energy can be transformed or transferred but is never lost.	<p>“I can..”</p> <ul style="list-style-type: none"> Describe the law of conservation of energy. Model energy transformations from one form to another. Identify how transformations are used in society to meet people’s energy needs. Show that a system of matter can be closed or open. Describe that closed systems will not gain or lose matter or energy Describe that open systems can gain or lose matter or energy Identify that Earth is an open system (atmosphere, body, ecosystems, hydrosphere...) Explain the Law of Conservation of Energy: energy is neither gained or lost it is only transformed or transferred. Describe how energy can be transferred from one form to another Explain that when energy is transferred, some of it is 	Heat Chemical Nuclear Mechanical (Electromagnetic) Gravitational Potential Radiant (Light) Elastic Electrical Sound Kinetic Potential Open System vs. Closed System	Tests Quizzes Labs Virtual labs Projects Bellwork Experiments Field Trips	

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		lost/dissipated (friction/heat), but it can be difficult to notice or measure			
~8 weeks (40 days)	7.PS.4: Energy can be transferred through a variety of ways.	<p>"I can.."</p> <ul style="list-style-type: none"> Students can identify transformations between different forms of potential and kinetic energy. <p><u>Mechanical Energy</u></p> <ul style="list-style-type: none"> Describe mechanical energy moves an object due to a push or pull (force) Describe that the nature of the mechanical movement depends on the strength of the force <p><u>Waves</u></p> <ul style="list-style-type: none"> Explain that waves are described by their speed, wavelength, amplitude and frequency. Explain that waves transfer energy from one place to another. Describe that mechanical waves can be transverse or longitudinal depending on the direction of their movement 	<p>Law of transformation of Energy</p> <p><u>Mechanical</u> force</p> <p><u>Wave</u> wave length Amplitude Frequency Crest Trough medium pitch longitudinal wave transverse wave sound wave light wave vibration Electromagnetic spectrum</p>	<p>Tests Quizzes Labs Virtual labs Projects Bellwork Experiments Field Trips</p>	



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		<ul style="list-style-type: none"> ● Explain that vibrations are wavelike disturbances that transfer energy ● Explain that waves can be described by their speed, wavelength, amplitude, and frequency ● Describe that the movement of waves can change when it travels through different mediums ● Explain that energy of a wave is dependent on the medium/material in which it travels through. ● Demonstrate the relationship between the frequency and wavelength of a wave. <p><u>Heat</u></p> <ul style="list-style-type: none"> ● Describe that heat energy is the random movement of particles ● Describe that as heat increases, the movement of the particles increases ● Describe that heat is transferred from warmer to cooler objects. ● Explain that conduction is the transfer of energy through the direct contact of particles. 	<p>Electromagnetic Compression Rarefaction mechanical wave</p> <p><u>Heat/Thermal</u> thermal energy conduction convection radiation density convection current kinetic theory of matter insulator conductor</p>		
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		<ul style="list-style-type: none"> Describe that convection is the movement of heat due to the differences in densities Show that cooler material with a greater density sinks Explain that warmer material with less density rises Show that radiant energy can be absorbed by objects, and transferred in the form of heat energy <p><u>Electrical</u></p> <ul style="list-style-type: none"> Explain that electrical energy transfers in a closed circuit. Explain that electrical energy can not move through an open circuit. Describe that current is the rate of charge flow through conductors (measured with an ammeter). Show that circuits are created when an energy source is connected to an electrical device. Electric potential energy has the ability to flow through a circuit. Electrical voltage is the electrical pressure from the flow of electricity 	<p>Electricity open circuit closed circuit electric circuit current ampere volt/voltage resistance parallel circuit series circuit conductor semiconductor electric potential ammeter voltmeter</p>		
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		<ul style="list-style-type: none"> • Voltage can be measured with a voltmeter • Electrical energy can be transformed to other forms of energy like light, sound, heat, and mechanical energy • Resistors in a circuit oppose the flow of current. The greater the resistance, the lower the current. • Relationships between current and resistance in series and parallel circuits. • Circuits can be parallel or in series. • A parallel circuit provides more than one path for the electricity to travel through <p><u>Chemical Potential</u></p> <ul style="list-style-type: none"> • Energy is stored in the bonds between atoms. • It takes energy to break bonds • When bonds form, energy is released. • When a chemical reaction takes place the amount of chemical potential energy usually changes. <p><u>Elastic Potential</u></p>	<p>Chemical bonds chemical reaction chemical change</p> <p>Elastic compression tension</p>		
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		<ul style="list-style-type: none"> • Explain that energy is transferred from one form to another in living things. • Model how energy moves through an ecosystem as a food web and a food chain. • Describe how the conservation of matter and energy is applied to ecosystems using an energy pyramid. • Analyze how matter and energy is transferred through an ecosystem. 	<p>photosynthesis light/radiant energy chloroplast carbon dioxide chlorophyll glucose sugar/glucose chemical energy respiration mitochondria carbon hydrogen oxygen decomposition organism population community ecosystem niche habitat adaptations food web food chain consumer/heterotroph herbivore carnivore omnivore scavenger producer/autotroph energy pyramid primary consumer secondary</p>		
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			consumer tertiary consumer decomposer symbiosis/symbiotic relationships mutualism commensalism parasitism abiotic factors biotic factors competition limiting factors carrying capacity biodiversity climate biome terrestrial biome aquatic biome ecological succession primary succession secondary succession		
~45 weeks (25 days)	7.LS.2: In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.	"I can.." <ul style="list-style-type: none"> Identify the different biotic and abiotic factors that determine biomes (topography, soil types, precipitation, temperature patterns, sunlight) Give examples of different biomes and where they can be 		Tests Quizzes Labs Virtual labs Projects Bellwork Experiments Field Trips	

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		<p>found around the world.</p> <ul style="list-style-type: none"> • Describe how the abiotic factors of sunlight and water can affect biodiversity. • Describe how biomes can be characterized by organisms that have evolved specific adaptations to succeed in their niche. • Explain how ecosystems can change due to disruptions in their abiotic or biotic factors. 			
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Old standards to be taught until the year 2020

<p>OLD (7.PS.1: <i>The properties of matter are determined by the arrangement of atoms.</i>)</p>	<p>This standard will no longer be included starting with the 202021 school year.</p>
<p>OLD (7.LS.1: <i>Matter is transferred continuously between one organism to another and between organisms and their physical environments.</i>)</p>	