

Fourth Grade Science Grade Level Content Expectations (GLCEs) v.12.07

Content Statement / Content Expectation	Words to Know	Know –Nouns-Content	Be Able to Do –Verbs-Skills and Resources
<b>SCIENCE PROCESSES: Inquiry Process</b> <i>S.IP.E.1 Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.</i>			
<b>S.IP.04.11</b> Make purposeful observation of the natural world using the appropriate senses.	5 Senses	Natural World	Observe
<b>S.IP.04.12</b> Generate questions based on observations.	Each Unit	Observations Questions	Generate
<b>S.IP.04.13</b> Plan and conduct simple and fair investigations.	Each Unit	Investigate	Plan and Conduct
<b>S.IP.04.14</b> Manipulate simple tools that aid observation and data collection (for example: hand lens, balance, ruler, meter stick, measuring cup, thermometer, spring scale, stop watch/timer, graduated cylinder/beaker).	Each Unit	Simple test Equipment hand lens, balance, ruler, meter stick, measuring cup, thermometer, spring scale, stop watch/timer, graduated cylinder/beaker	Manipulate
<b>S.IP.04.15</b> Make accurate measurements with appropriate units (millimeters centimeters, meters, milliliters, liters, Celsius, grams, seconds, minutes) for the measurement tool.	Each Unit	Units- millimeters centimeters, meters, milliliters, liters, Celsius, grams, seconds, minutes	Measure
<b>S.IP.04.16</b> Construct simple charts and graphs from data and observations.		Charts graphs, data	Construct
<b>SCIENCE PROCESSES: Inquiry Analysis and Communication</b> <i>S.IA.E.1 Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.</i>			
<b>S.IA.04.11</b> Summarize information from charts and graphs to answer scientific questions.	Each Unit	Charts graphs, data	Summarize
<b>S.IA.04.12</b> Share ideas about science through purposeful conversation in collaborative groups.	Each Unit	Conversations	Share ideas
<b>S.IA.04.13</b> Communicate and present findings of observations and investigations.	Each Unit	Findings	Communicate and present
<b>S.IA.04.14</b> Develop research strategies and skills for information gathering and problem solving.		Problem solving	Develop
<b>S.IA.04.15</b> Compare and contrast sets of data from multiple trials of a science investigation to explain reasons for differences.		Data, trials, investigation	Compare and contrast
<b>SCIENCE PROCESSES: Reflection and Social Implications</b> <i>S.RS.E.1 Reflecting knowledge is the application of scientific knowledge to new and different situations. Reflecting knowledge requires careful analysis of evidence that guides decision making</i>			

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<b><i>and the application of science throughout history and within society.</i></b>			
<b>S.RS.04.11</b> Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.		Illustrations, performances, models, exhibits, and activities.	Summarize
<b>S.RS.04.14</b> Use data/samples as evidence to separate fact from opinion.	Evidence, samples, fact, opinion	Fact, opinion, Data, samples	Use
<b>S.RS.04.15</b> Use evidence when communicating scientific ideas.	communicating	Scientific ideas, evidence	use
<b>S.RS.04.16</b> Identify technology used in everyday life.	technology	Technology	Identify
<b>S.RS.04.17</b> Identify current problems that may be solved through the use of technology.		Technology problems	Identify
<b>S.RS.04.18</b> Describe the effect humans and other organisms have on the balance of the natural world.	Balance, organisms	Organisms, natural world	describe
<b>S.RS.04.19</b> Describe how people have contributed to science throughout history and across cultures.	contributed	History, cultures	describe
<b>PHYSICAL SCIENCE: Energy</b>			
<b><i>P.EN.E.1 Forms of Energy- Heat, electricity, light, and sound are forms of energy.</i></b>			
<b>P.EN.04.12</b> Identify heat and electricity as forms of energy.	heat electricity energy.	heat electricity energy.	identify
<b><i>P.EN.E.4 Energy and Temperature- Increasing the temperature of any substance requires the addition of energy.</i></b>			
<b>P.EN.04.41</b> Demonstrate how temperature can be increased in a substance by adding energy.	Heat, temperature	temperature	Demonstrate
<b>P.EN.04.42</b> Describe heat as the energy produced when substances burn, certain kinds of materials rub against each other, and when electricity flows through wire.	circuit, friction, burn, flow	Heat, energy, substances, materials,	describe
<b>P.EN.04.43</b> Describe how heat is produced through electricity, rubbing, and burning.			describe
<b><i>P.EN.E.5 Electrical Circuits- Electrical circuits transfer electrical energy and produce magnetic fields.</i></b>			
<b>P.EN.04.51</b> Explain how electrical energy is transferred and changed through the use of a simple circuit.	Conductor, insulator, energy, transfer, circuit,	Energy, electricity	explain
<b>P.EN.04.52</b> Create a simple working electromagnet and explain the conditions necessary to make the electromagnet.		Electromagnet, conditions	Create, explain
<b>Properties of Matter</b>			
<b><i>P.PM.E.1 Physical Properties- All objects and substances have physical properties that can be</i></b>			

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<b>measured.</b>			
<b>P.PM.04.16</b> Measure the weight (spring scale) and mass (balances in grams or kilograms) of objects.	Spring scale, balance, gram, kg	Weight, mass	measure
<b>P.PM.04.17</b> Measure volumes of liquids and capacities of containers in milliliters and liters.	Millimeters, liters	Volume, capacity	measure
<b>P.PM.04.18</b> Demonstrate the use of centimeter cubes poured into a container to estimate the container's capacity.	centimeters	Capacity, volume	demonstrate
<b>P.PM.E.2 States of Matter- Matter exists in several different states: solids, liquids, and gases. Each state of matter has unique physical properties. Gases are easily compressed, but liquids and solids do not compress easily. Solids have their own particular shapes, but liquids and gases take the shape of the container.</b>			
<b>P.PM.04.23</b> Compare and contrast the states (solids, liquids, gases) of matter.	Solid, liquid, gas	States of matter	Compare and contrast
<b>P.PM.E.3 Magnets- Magnets can repel or attract other magnets. Magnets can also attract certain non-magnetic objects at a distance.</b>			
<b>P.PM.04.33</b> Demonstrate magnetic field by observing the patterns formed with iron filings using a variety of magnets.	Repel Attract Magnetic Field Lodestone Magnetite North and South Poles Compass Magnetic Force	Magnetic field Iron filings magnets	Demonstrate a magnetic field- iron filings, overhead, mark magnetic fields Observe- students record their findings
<b>P.PM.04.34</b> Demonstrate why non-magnetic objects are affected by the strength of the magnet and the distance away from the magnet. <b>(Don will research and let us know)</b>	Nonmagnetic		
<b>P.PM.E.5 Conductive and Reflective Properties- Objects vary to the extent they absorb and reflect light energy and conduct heat and electricity.</b>			
<b>P.PM.04.53</b> Identify objects that are good conductors or poor conductors of heat and electricity. <b>(Needs to be taught after Electricity – P.EN.E.5.)</b>	Insulator Conductor Reflective Absorb	Objects Conductors Heat Electricity	Identify
<b>Changes in Matter</b>			
<b>P.CM.E.1 Changes in State- Matter can be changed from one state (liquid, solid, gas) to another and then back again. This may be caused by heating and cooling.</b>			
<b>P.CM.04.11</b> Explain how matter can change from one state (liquid, solid, gas) to another by heating and cooling.	Liquid Solid Gas	Matter State	Explain Heating Cooling

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	Evaporation Condensation State of Matter Water Cycle		
<b>LIFE SCIENCE: Organization of Living Things</b> <i>L.OL.E.1 Life Requirements- Organisms have basic needs. Animals and plants need air, water, and a source of energy. Plants also require light. Plants and animals require a source of energy and building material for growth and repair.</i>			
<b>L.OL.04.15</b> Determine that plants require air, water, light, and a source of energy and building material for growth and repair.	Photosynthesis Organism Basic Needs Hydrogen Oxygen Plant Cycle	Plants Air Water Light Building Material Source of Energy	Determine
<b>L.OL.04.16</b> Determine that animals require air, water, and a source of energy and building material for growth and repair.	Animal	Animal Air Water Source of Energy	Determine
<b>Evolution</b> <i>L.EV.E.2 Survival- Individuals of the same kind differ in their characteristics, and sometimes the differences give individuals an advantage in surviving and reproducing.</i>			
<b>L.EV.04.21</b> Identify individual differences (for example: color, leg length, size, wing size) in organisms of the same kind.	Identify Classify Adaptation Characteristic Vertebrate Invertebrate Organism	Individual differences Organisms	Identify
<b>L.EV.04.22</b> Identify how variations in physical characteristics of individual organisms give them an advantage for survival and reproduction.	Advantage Reproduction Survival Mammal	Variations Physical characteristics Survival Reproduction	Identify
<b>Ecosystems</b> <i>L.EC.E.1 Interactions- Organisms interact in various ways including providing food and shelter to one another. Some interactions are helpful: others are harmful to the organism and other organisms.</i>			
<b>L.EC.04.11</b> Identify organisms as part of a food chain or food web.	Food Chain Food Web Producers Consumers Decomposers	Food Chain Food Web Organism	Identify

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	Interaction Interdependence Omnivore Herbivore Carnivore Mutualism Parasite Host *Sun (all life starts from sun) Scavenger Predator Prey		
<b><i>L.EC.E.2 Changed Environment Effects- When the environment changes, some plants and animals survive to reproduce; others die or move to new locations.</i></b>			
<b>L.EC.04.21</b> Explain how environmental changes can produce a change in the food web.	Environment Capacity Ecosystem Biome Erosion Deforestation Habitat Fertilizer Urban Sprawl Pollution Pesticide Resources Competition Landscape Ecology Ecologist	Environmental Change Food Web	Explain Produce
<b>EARTH SCIENCE: Earth in Space and Time</b> <b><i>E.ST.E.1 Characteristics of Objects in the Sky- Common objects in the sky have observable characteristics.</i></b>			
<b>E.ST.04.11</b> Identify common objects in the sky, such as the sun and the moon.	Solar System Galaxy Planets Constellation Satellites Asteroids Comets Atmosphere	Common Objects Sun Moon	Identify

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<b>E.ST.04.12</b> Compare and contrast the characteristics of the sun, moon and Earth, including relative distances and abilities to support life.	Atmosphere Gravity Orbit Axis Rotation Magnetism Climate Temperature	Relative Distance Life	Compare Contrast
<b><i>E.ST.E.2 Patterns of Objects in the Sky- Common objects in the sky have observable characteristics and predictable patterns of movement.</i></b>			
<b>E.ST.04.21</b> Describe the orbit of the Earth around the sun as it defines a year.	Season Orbit Revolution Equinox(shortest and longest day) Axis	Orbit Earth Sun Year	Describe
<b>E.ST.04.22</b> Explain that the spin of the Earth creates day and night.	Rotation	Spin Earth Day Night	Explain
<b>E.ST.04.23</b> Describe the motion of the moon around the Earth. <b>(Do .04.23-25 all at the same time)</b>	Orbit Gravity Eclipse Solar Lunar Harvest Leap Year Axis Phases Waxing Waning	Motion Moon Earth	Describe
<b>E.ST.04.24</b> Explain how the visible shape of the moon follows a predictable cycle which takes approximately one month.	Ditto	Visible Shape Moon Cycle Month	Explain
<b>E.ST.04.25</b> Describe the apparent movement of the sun and moon across the sky through day/night and the seasons.	Ditto	Movement Sun Moon Sky Day/Night Seasons	Describe
<b><i>E.ST.E.3 Fossils- Fossils provide evidence about the plants and animals that lived long ago and the</i></b>			

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<b><i>nature of the environment at that time.</i></b>			
<b>E.ST.04.31</b> Explain how fossils provide evidence of the history of the Earth.	Archeology Archeologist Sediment Evidence Rocks Geological Geology Layers	Fossils History Earth	Explain
<b>E.ST.04.32</b> Compare and contrast life forms found in fossils and organisms that exist today.	Fossils Evidence	Life Forms Fossils Organisms	Compare and Contrast