

Important Communication Elements of 4th and 5th Grade Science Standards

Ideas	Important Vocabulary	Tools/Data to Use	Pictures/Graphics to Recognize
4th Earth Science			
<p><i>Properties of rocks and minerals reflect the processes that formed them.</i></p> <p>1) You can tell igneous, sedimentary, metamorphic rocks apart by their different properties and different methods of formation, the rock cycle 2) You can use a diagnostic property table to identify common rock-forming minerals (quartz, calcite, feldspar, mica, hornblende) and ore minerals.</p>	mineral, rock, ore, crystals igneous sedimentary, sedimentation metamorphic formation rock cycle names of common minerals luster, opaque, translucent, cleavage	diagnostic property table (<i>to distinguish between rocks and minerals</i>)	data from rock tests
<p><i>Waves, wind, water, and ice shape and reshape the Earth's land surface.</i></p> <p>1) There are slow and rapid processes that change the Earth (erosion, landslide, volcanoes, earthquakes) 2) Natural processes break down rocks into smaller pieces (freezing/thawing, root growth) 3) Moving water erodes landforms, rearranging rocks, pebbles, sand, and silt (weathering, transport, deposition)</p>	erodes, erosion landslide, glacier volcanoes, erupt, magma, lava earthquake, tremor, tsunami seismograph weathering, abrasion freezing, thawing, expansion, contraction transport, deposition, moraines		seismograph readings drawings/pictures of glacial moraines, river deposition, river canyons, sedimentary rock layers
4th Life Science			
<p><i>All organisms need energy and matter to live and grow.</i></p> <p>1) Plants are the primary source of matter and energy entering most food chains 2) Producers and consumers make up food chains and food webs, competing for resources in ecosystem (herbivores, carnivores, omnivores, and decomposers) 3) Decomposers recycle matter from dead plants and animals (includes many microorganisms, fungi, insects)</p>	matter, energy food chains food webs producer, consumer, decomposer predator, prey carnivore, herbivore, omnivore recycle		food chain food web
<p><i>Living organisms depend on one another and their environment for survival.</i></p> <p>1) Ecosystems include both living and non-living components (organisms, soils, climate, etc) 2) In each environment some organisms thrive, some do less well, and some cannot survive at all. 3) Relationships between plants and animals (pollination, seed dispersal, animals rely on plants for food and shelter) 4) Role of microorganisms (beneficial, most are not "germs")</p>	ecosystem, biomes living, non-living organism soil climate habitats (<i>within ecosystems</i>) thrive, survive, competition relationships (<i>for food, shelter, seed dispersal, pest removal</i>) pollination, reproduction microorganisms	agar plates for microorganism growth microscope (<i>know parts, purpose</i>) transects of particular area to study	population graphs

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4th Physical Science			
<p><i>Electricity and magnetism are related effects that have useful applications in everyday life.</i></p> <p>1) You can build series and parallel circuits with wires, batteries and bulbs 2) You can build a simple compass to detect Earth's magnetic field 3) Electric currents produce magnetic fields, build simple electromagnet 4) Electromagnets are used to construct electric motors, generators, and simple devices (doorbells) 5) Behaviour of electrically charged objects (repel, attract) 6) Magnets have two poles that react to each other (north, south, like poles repel, unlike poles attract) 7) Electrical energy can be converted to heat, light, motion (electrical cars and trains, power to homes)</p>	<p>series circuit parallel circuit wire, battery, bulb (<i>electric or plant</i>) compass magnetic field current (<i>electric or river</i>) electromagnet electric motor, generator repel, attract magnetic pole electrical energy (<i>one form of energy</i>) heat, light, motion (<i>other forms of energy</i>)</p>	<p>circuit (<i>to carry electricity</i>) voltmeter compass (<i>to determine direction</i>) electromagnet, motors (<i>uses, parts</i>) magnets</p>	<p>circuit diagram drawing of an electromagnet and a motor magnetic lines of force</p>
5th Earth Science			
<p><i>Water on Earth moves between the oceans and land through the processes of evaporation and condensation.</i></p> <p>1) Most of Earth's water is salt water in oceans which cover most of the Earth's surface 2) When liquid water evaporates it turns into water vapor and can reappear as liquid when cooled, or solid if cooled below freezing point 3) Water vapor moves in air, can form clouds or fog (tiny droplets of water or ice) and can fall to Earth as rain, hail, sleet, or snow 4) Fresh water is limited (located in rivers, lakes, underground sources and glaciers), and can be made more available to meet needs through recycling and avoiding waste. 5) Your water comes from particular surface and/or groundwater supplies (local community water sources)</p>	<p>ocean liquid, vapor, ice evaporation, evaporates condensation precipitation freezing point groundwater surface water pump, reservoir, dam water cycle</p>	<p>thermometers, heat source for evaporation map or diagram of local water supply system</p>	<p>water cycle diagram line diagrams of water supply and treatment systems</p>
<p><i>Energy from the sun heats the Earth unevenly, causing air movements resulting in changing weather patterns.</i></p> <p>1) Wind, convection currents, are air movements caused by uneven heating of the Earth 2) The oceans influence the weather and the water cycle plays a role in weather patterns 3) There are several causes and effects of severe weather (hurricanes, typhoons, tornadoes) 4) You can use weather maps & data to predict weather, forecasts depend on many variables 5) Earth's atmosphere exerts a pressure, decreasing with altitude, that is equal in all directions at any point.</p>	<p>wind convection current weather, climate severe weather - hurricane - typhoon - tornadoes forecast, variables atmosphere atmospheric pressure</p>	<p>newspapers and other references showing weather maps and symbols (<i>to predict the weather</i>) barometer</p>	<p>weather maps and symbols world maps showing winds and currents pictures showing typical air movement over land and water</p>

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<p><i>The solar system consists of planets and other bodies that orbit the sun in predictable paths.</i></p> <p>1) The sun, an average star, central and largest body in solar system, made of hydrogen and helium 2) Solar system contains: Earth, moon, sun, eight other planets & their satellites, smaller objects (comets, asteroids) 3) Path of a planet (orbit) is due to gravitational attraction between Sun and planet.</p>	solar system planets stars, Sun asteroid comet moons orbit gravity gravatational attraction	telescope (<i>purpose</i>)	diagram of solar system
5th Life Science			
<p><i>Plants and animals have structures for respiration, digestion, waste disposal, and transport of materials.</i></p> <p>1) Multicellular organisms have specialized structures 2) Blood circulatory system (heart, lungs), lungs and tissues exchange oxygen and carbon dioxide 3) Steps and organs of digestive system 4) Role of kidneys, bladder in cellular waste removal 5) Plant processes and structures moving sugar, water, minerals 6) Plants use carbon dioxide and energy to make molecules of sugar and release oxygen 7) Plant and animal cells break down sugar to obtain energy, releasing carbon dioxide and water</p>	structure (<i>building vs internal organs</i>) cells cell respiration (<i>plants and animals</i>) digestion (<i>animals get energy by eating</i>) photosynthesis (<i>plants get energy by</i>) transport, tissues multicellular circulatory system - heart, lungs, veins, vessels digestive system - esophagus, stomach, small intestine, large intestine cellular waste removal - kidneys, bladder roles of sugar, CO ₂ , oxygen, water		pictures of internal organs diagram of photosynthesis
5th Physical Science			
<p><i>Elements and their combinations account for all the varied types of matter.</i></p> <p>1) During chemical reactions atoms rearrange into different products with different properties 2) All matter is made of atoms, which combine to form molecules 3) Common properties of metals (conductivity, pure vs combinations of elemental metals) 4) Each element is one kind of atom, organized in Periodic Table 5) With instruments you can see that atoms and molecules are discrete and in well ordered arrays. 6) Separate mixtures and identify compounds using their chemical and physical properties 7) Properties of common molecules (sugar, water, oxygen, etc.) 8) Just a few elements make all living things and most materials 9) Common properties of salts (sodium chloride)</p>	element atom molecule chemical reaction, physical change reactants, acid, base, indicator properties (<i>multiple meanings</i>) properties of metals - <u>conductive</u> - <u>reactive</u> - makes positive <u>ions</u> in <u>solution</u> - easily combined into <u>alloys</u> (<i>combinations of elements</i>) mixtures, compounds, solutions salts	periodic table tools for separating mixtures and identifying compounds: magnets, screens, water, heat sources, thermometers, pH indicator, voltmeter, etc.	diagrams of water molecules, sugar molecule, oxygen molecule, different carbon forms symbols for common elements and molecules