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**Science Standards  
Grade 5**

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Strand:

**S1 Scientific Inquiry:** The student demonstrates abilities necessary to do scientific inquiry and an understanding about scientific inquiry; that is, the student:

Standards: S1a: identifies and clarifies questions that can be answered through scientific investigations.

Components:

S1a1. analyzes a problem and determines appropriate questions that can be answered through investigations.

S1a2. develops a plan for how their questions might be answered based on a hypothesis.

Standards: S1b: identifies a hypothesis to guide their investigations.

S1c: designs and conducts controlled investigations.

Components:

S1c1. identifies and gathers materials and/or information sources needed to conduct investigations.

S1c2. identifies variables to be controlled.

S1c3. plans and follows logical steps to conduct controlled investigations.

S1c4. performs measurements using appropriate scientific tools (such as thermometers, microscopes, probes, planispheres, etc.) and units of measure (U.S. customary units and metric units).

S1c5. records data from investigations in an organized and appropriate format (e.g., t-chart, table, list, line graph, written log, etc).

Standards: S1d: forms relationships between evidence and explanations.

S1e: begins to recognize and analyze alternative explanation and conclusions.

S1f: analyzes, makes statements, and forms conclusions using models and data displayed in a Venn diagram, graph and table.

S1g: communicates scientific explorations through discussions, drawing, graphs, tables, reports, and multi-media presentations.

S1h: demonstrates safe practices in science.

Components:

S1h1. explains and conducts safe Sun and night sky viewing procedures and practices.

S1h2. explains and conducts safe use of tools and simple machines.

S1h3. explains and conducts safe experiments involving chemicals.

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**S2 History and Nature of Science:** The student demonstrates an understanding of science as a human endeavor, that is, the student:

Standards: S2a: explains the variety of contributions and discoveries about objects, events, and phenomena in nature were made by women and men who chose careers in science.

S2b: understands that scientists value peer review and making public the result of scientific pursuits; science is not separate from society.

S2c: understands that doing science requires varying human abilities, interest, and habits of mind (such as: reasoning, insight, skill, creativity, intellectual honesty, skepticism, and openness to new ideas).

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**S3 Personal & Social Perspectives:** The student demonstrates an understanding of safety, types of resources, and changes in the environment; that is, the student:

Standards: S3a: explores the personal and societal challenges caused by both natural and human-made changes to the environment.

S3b: weighs the risks and benefits of resource use and management on the environment and human population.

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**S4 Science and Technology:** The student demonstrates an understanding of science and technology and the nature of technological design; that is, the student:

Standards: S4a: identifies a problem, designs a solution or product that addresses the problem, implements the design, and evaluates and communicates the design process to others.

S4b: identifies some of the technological solutions that make life easier and the trade-offs (safety, cost, efficiency, health and environmental side effects, etc.) involved in those solutions.

S4c: explains how scientific inquiry and technological design are similar and different.

Strand:

**S5 Physical Science:** The student demonstrates a conceptual understanding of matter, motion and energy; that is, the student:

Standards: S5a: explains that some materials may be composed of pieces too small to see without tools that magnify the material.

Components:

S5a1. explains that some materials are collections of small solids (e.g., sand, sugar, salt, powder) that can be viewed with a hand lens.

S5a2. determines that some materials (i.e., powders, sands) can be separated by their physical properties.

S5a3. demonstrates methods used to separate mixtures based on observable physical properties (e.g., screening, filtering).

Standards: S5b: investigates how some common materials interact to form new materials.

Components:

S5b1. demonstrates that combining two or more materials may retain or lose the materials' original properties.

S5b2. groups materials by their reactions with other materials and explains how reactions can be used to identify materials

S5b3. identifies properties of a material, made from combining two or materials, that are the same and/or different from the original materials.

Standards: S5c: demonstrates an understanding of how force, distance, and work are involved in simple machines.

Components:

S5c1. demonstrates that simple machines can change the direction or the size of an applied force.

S5c2. explains that simple machines reduce the force, or change the direction of force, needed to do work.

S5c3. compares the mass of an object to the force required to move it.

S5c4. describes the motion of an object by its position, direction of motion, and speed.

S5c5. describe and explain the relationship between the strength of a force and its effect on the motion on an object.

S5c6. describes tradeoffs of various simple machines (e.g., the easier it is to lift an object with a lever, the less high it is lifted).

Standards: S5d: distinguishes among different forms of energy and demonstrates that energy can change forms.

Components:

S5d1. recognizes that heat, light, sound, electricity, magnetism and motion are associated with energy.

S5d2. demonstrates that energy can be changed from one form into another (e.g., electrical energy into light, sunlight into heat or electricity).

Strand:

**S6 Life Science:** The student demonstrates a conceptual understanding of the structure and function of living systems, and ecosystems; that is, the student:

Standards: S6a: gains an understanding that the cell is the fundamental unit of life.

Components:

S6a1. observes and draws a variety of cells, using microscopes or video technology.

S6a2. explains that all organisms are composed of cells, the fundamental units of life.

S6a3. recognizes that most organisms are single-celled; others, including humans, are multi-cellular.

S6a4. relates cells to building blocks for more complex structures in multi-cellular organisms (e.g., tissues, organs, systems).

Standards: S6b: investigates adaptations of structures that carry out essential functions.

Components:

S6b1. provides examples of adaptations in structures that carry out essential life functions after studying various organisms and ecosystems (e.g., radulae in snails, gills in fish, ciliae in rotifers).

Standards: S6c: investigates how structures in organisms coordinate to carry out essential functions.

Components:

S6c1. recognizes the complementary nature of structure and function in living things, using examples from a studied ecosystem.

S6c2. investigates and describes how structures within organisms work together to serve specialized functions.

S6c3. predicts what might happen if one structure of an organism's body fails to perform its particular function.

Standards: S6d: examines and describes the flow of matter and energy in living systems.

Components:

S6d1. illustrates, with examples, food chains and webs that show the flow of matter and energy in an ecosystem.

S6d2. explains that (most) living things depend on food and oxygen for growth, repair, and energy.

S6d3. discusses and provides examples of how all organisms ultimately depend on the Sun for food and energy.

Strand:

**S7 Earth & Space Sciences:** The student demonstrates a conceptual understanding of Earth's systems, history, and significance in the solar system; that is, the student:

Standards: S7a: investigates landforms and relates a combination of constructive and destructive forces to their formation.

Components:

S7a1. identifies major features of earth's surface.

S7a2. describes and examines constructive forces (including volcanic eruption and sediment deposition) that change landforms.

S7a3. describes and examines destructive forces (including weathering and erosion from waves, wind, and water) that change landforms.

S7a4. observes and explains that weathered rock, along with organic materials from decomposed plants, animals, and bacteria (and possibly pieces of living organisms), make up soil.

S7a5. observe and describe that soils are often found in layers, each having a different composition and texture.

Standards: S7b: describes and gives examples of ways in which earth's surface is built up and torn down by natural and human-produced processes.

Components:

S7b1. examines and differentiates the geological processes that build and/or change features of the earth's surface.

S7b2. explains how weathering and erosion reshape landforms by eroding rock and soil in some areas and depositing them in others

S7b3. describes how forces over time lead to the formation of sedimentary rock

S7b4. interprets the impact of weather on earth materials.

Standards: S7c: develops an understanding of the Sun as a source of energy.

Components:

S7c1. identifies different forms of energy emitted by the Sun and provides examples from investigations.

S7c2. identifies, observes and describes the physical features of the Sun (e.g., sunspots, flares) using photographic images.

S7c3. identifies the Sun as our most important source of energy.

S7c4. describes how sunlight falling upon a tilted surface is less intense than direct sunlight and understands how that affects temperatures and seasons.

S7c5. identifies, observes and describes the physical features of the Sun (e.g. sunspots, flares) using photographic images.

Standards: S7d: investigates the apparent motion of the stars.

Components:

S7d1. identifies and finds constellations in the nighttime sky using a planisphere.

S7d2. observes, records, and describes the apparent motion of the constellations daily and seasonally.