

## Grade Band Theme: Order and Organization

*This theme focuses on helping students use scientific inquiry to discover patterns, trends, structures and relationships that may be described by simple principles. These principles are related to the properties or interactions within and between systems.*

### Earth and Space Science (ESS)

#### Topic: Rocks, Minerals and Soil

This topic focuses the study of rocks, minerals and soil, which make up the lithosphere. Classifying and identifying different types of rocks, minerals and soil can decode the past environment in which they formed.

#### Content Statements

- Minerals have specific, quantifiable properties.
  - Minerals are naturally occurring, inorganic solids that have a defined chemical composition. Minerals have properties that can be observed and measured. Minerals form in specific environments.
- Igneous, metamorphic and sedimentary rocks have unique characteristics that can be used for identification and/or classification.
  - Most rocks are composed of one or more minerals, but there are a few types of sedimentary rocks that contain organic material, such as coal. The composition of the rock, types of mineral present, mineral arrangement, and/or mineral shape and size can be used to identify the rock and to interpret its history of formation, breakdown (weathering) and transport (erosion).
- Igneous, metamorphic and sedimentary rock form in different ways.
  - Magma or lava cools and crystallizes to form igneous rocks. Heat and pressure applied to existing rock forms metamorphic rocks. Sedimentary rock forms as existing rock weathers chemically and/or physically and the weathered material is compressed and then lithifies. Each rock type can provide information about the environment in which it was formed.
- Soil is unconsolidated material that contains nutrient matter and weathered rock.
  - Soil formation occurs at different rates and is based on environmental conditions, types of existing bedrock and rates of weathering. Soil forms in layers known as horizons. Soil horizons can be distinguished from one another based on properties that can be measured.
- Rocks, minerals and soils have common and practical uses.
  - Nearly all manufactured material requires some kind of geologic resource. Most geologic resources are considered nonrenewable. Rocks, minerals and soil are examples of geologic resources that are nonrenewable.

## Physical Science (PS)

### Topic: Matter and Motion

This topic focuses on the study of foundational concepts of the particulate nature of matter, linear motion, kinetic and potential energy.

#### Content Statements

- All matter is made up of small particles called atoms.
  - Each atom takes up space, has mass and is in constant motion. Mass is the amount of matter in an object.
  - Elements are a class of substances composed of a single kind of atom.
  - Molecules are the combination of two or more atoms that are joined together chemically.
  - Compounds are composed of two or more different elements. Each element and compound has properties, which are independent of the amount of the sample.
- Changes of state are explained by a model of matter composed of atoms and/or molecules that are in motion.
  - When substances undergo changes of state, neither atoms nor molecules themselves are changed in structure.
  - Thermal energy is a measure of the motion of the atoms and molecules in a substance.
  - Mass is conserved when substances undergo changes of state.
- There are two categories of energy: kinetic and potential.
  - Objects and substances in motion have kinetic energy.
  - Objects and substances can have energy as a result of their position (potential energy).
- An object's motion can be described by its speed and the direction in which it is moving.
  - An object's position and speed can be measured and graphed as a function of time.

## Life Science (LS)

### Topic: Cellular to Multicellular

This topic focuses on the study of the basics of Modern Cell Theory. All organisms are composed of cells, which are the fundamental unit of life. Cells carry on the many processes that sustain life. All cells come from pre-existing cells.

#### Content Statements

- Cells are the fundamental unit of life.
    - All living things are composed of cells. Different body tissues and organs are made of different kinds of cells. The ways cells function are similar in all living things.
  - All cells come from pre-existing cells.
    - Cells repeatedly divide resulting in more cells and growth and repair in multicellular organisms.
  - Cells carry on specific functions that sustain life.
    - Many basic functions of organisms occur in cells. Cells take in nutrients and energy to perform work, like making various molecules required by that cell or an organism.
    - Every cell is covered by a membrane that controls what can enter and leave the cell.
    - Within the cell are specialized parts for the transport of materials, energy capture and release, protein building, waste disposal, information feedback and movement.
  - Living systems at all levels of organization demonstrate the complementary nature of structure and function.
    - The level of organization within organisms includes cells, tissues, organs, organ systems and whole organisms.
    - Whether the organism is single-celled or multicellular, all of its parts function as a whole to perform the tasks necessary for the survival of the organism.
    - Organisms have diverse body plans, symmetry and internal structures that contribute to their being able to survive in their environments.
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## Literacy in Science & Technical Subjects: Grades 6 - 8

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The standards below begin at grade 6; standards for K–5 reading in history/social studies, science, and technical subjects are integrated into the K–5 Reading standards. The CCR anchor standards and high school standards in literacy work in tandem to define college and career readiness expectations—the former providing broad standards, the latter providing additional specificity.

### Key Ideas and Details

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- Cite specific textual evidence to support analysis of science and technical texts.
- Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
- Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

### Craft and Structure

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- Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6–8 texts and topics*.
- Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
- Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

### Integration of Knowledge and Ideas

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- Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
- Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
- Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

### Range of Reading and Level of Text Complexity

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- By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.
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