Oakwood City School District
Grade Seven Science

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This course features an integrated science curriculum that offers the student learning experiences in the areas of Earth and Space Science, Life Science, and Physical Science. Emphasis is placed on gaining an understanding of basic concepts through a variety of classroom activities and laboratories. Students are given the opportunity to solve problems and extend their critical thinking skills, as well as to work cooperatively with their fellow students.

Science Inquiry and Application Standards

During the years of grades 5-8 all students must use the following scientific processes with appropriate laboratory safety techniques to construct their knowledge and understanding in all science content areas.

- Identify questions that can be answered through scientific investigations
- Design and conduct a scientific investigation
- Use appropriate mathematics, tools and techniques to gather data and information
- Analyze and interpret data
- Develop descriptions, models, explanations and predictions
- Think critically and logically to connect evidence and explanations
- Recognize and analyze alternative explanations and predications
- Communicate scientific procedures and explanations.

English Language Arts Standards for Science & Technical Subjects

I Key Ideas and Details

A Cite specific textual evidence to support analysis of science and technical texts.

B Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

C Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

II Craft and Structure

A 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*.

B 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.

C Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

III Integration of Knowledge and Ideas

A 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).

B Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

C Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

IV Range of Reading and Level of Text Complexity

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

Writing Standards for Literacy in Science & Technical Subjects

I Text Types and Purposes Standard 1

A Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
B Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
C Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
D Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
E Provide a concluding statement or section that follows from and supports the argument presented.

II Text Types and Purposes Standard 2

A Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
B Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
C Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
D Use precise language and domain-specific vocabulary to inform about or explain the topic.
E Establish and maintain a formal style and objective tone.
F Provide a concluding statement or section that follows from and supports the information or explanation presented.

III Production and Distribution of Writing

A Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
B With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.
C Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

IV Research to Build and Present Knowledge

A Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

B Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

C Draw evidence from informational texts to support analysis reflection, and research.

V Range of Writing

A Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

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Content Standards

Earth and Space Science

I Cycles and Patterns of Earth and the Moon: This topic focuses on Earth's hydrologic cycle, patterns that exist in atmospheric and oceanic currents, the relationship between thermal energy and the currents, and the physical features of Earth and how they formed. This includes the interior of Earth, the rock record, plate tectonics and landforms.

A The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.

1 Thermal energy is transferred as water changes state throughout the cycle. The cycling of water in the atmosphere is an important part of weather patterns on Earth. The rate at which water flows through soil and rock is dependent upon the porosity and permeability of the soil or rock.
2 Contamination can occur within any step of the hydrologic cycle. Ground water is easily contaminated as pollution present in the soil or spilled on the ground surface moves into the ground water and impacts numerous water sources.

B Thermal energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.

1 The sun is the major source of energy for wind, air and ocean currents and the hydrologic cycle. As thermal energy transfers occur in the atmosphere and ocean, currents form. Large bodies of water can influence weather and climate. The jet stream is an example of an atmospheric current and the Gulf Stream is an example of an oceanic current. Ocean currents are influenced by factors other than thermal energy, such as water density, mineral content (such as salinity), ocean floor topography and Earth's rotation. All of these factors delineate global climate patterns on Earth.

C The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.

1 The atmosphere is held to the Earth by the force of gravity. There are defined layers of the atmosphere that have specific properties, such as temperature, chemical composition and physical characteristics. Gases in the atmosphere include nitrogen, oxygen, water vapor, carbon dioxide and other trace gases. Biogeochemical cycles illustrate the movement of specific elements or

molecules (such as carbon or nitrogen) through the lithosphere, biosphere, hydrosphere and atmosphere.

D The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon

1 The moon's orbit and its change of position relative to the Earth and sun result in different parts of the moon being visible from Earth (phases of the moon). A solar eclipse is when Earth moves into the shadow of the moon (during a new moon). A lunar eclipse is when the moon moves into the shadow of Earth (during a full moon). Gravitational force between the Earth and the moon causes daily oceanic tides. When the gravitational forces from the sun and moon align (at new and full moons) spring tides occur. When the gravitational forces of the sun and moon are perpendicular (at first and last quarter moons), neap tides occur. The formation of the planet generated heat from gravitational energy and the decay of radioactive elements, which are still present today. Heat released from Earth's core drives convection currents throughout the mantle and the crust.

Physical Science

I Conservation of Mass and Energy: This topic focuses on the empirical evidence for the arrangements of atoms on the Periodic Table of Elements, conservation of mass and energy, transformation and transfer of energy.

A The properties of matter are determined by the arrangement of atoms.

1 Elements can be organized into families with similar properties, such as highly reactive metals, less-reactive metals, highly reactive nonmetals and some gases that are almost-completely nonreactive.

2 Substances are classified according to their properties, such as metals and acids.

3 When substances interact to form new substances, the properties of the new substances may be very different from those of the old, but the amount of mass does not change.

B Energy can be transformed from one form to another or can be transferred from one system to another, but is never lost.

1 When energy is transferred from one system to another, the quantity of energy before transfer equals the quantity of energy after transfer. When energy is transformed from one form to another, the total amount of energy remains the same.

C Energy can be transferred through a variety of ways.

1 Mechanical energy can be transferred when objects push or pull on each other over a distance.
2 Electromagnetic waves transfer energy when they interact with matter.
3 Thermal energy can be transferred through radiation, convection and conduction.
4 Electrical energy transfers when an electrical source is connected in a complete electrical circuit to an electrical device.

Life Science

I Cycles of Matter and Flow of Energy: This topic focuses on the impact of matter and energy transfer within the biotic component of ecosystems and on the continuation of a species.

A Matter is transferred continuously between one organism to another and between organisms and their physical environments.

1 Plants use the energy in light to make sugars out of carbon dioxide and water (photosynthesis). These materials can be used and immediately stored for later use. Organisms that eat plants break down plant structures to produce the materials and energy they need to survive. Then other organisms consume them.
2 Energy can transform from one form to another in living things. Animals get energy from oxidizing their food, releasing some of its energy as heat.
3 The total amount of matter and energy remains constant, even though its form and location change.

B In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.

1 Biomes are regional ecosystems characterized by distinct types of organisms that have developed under specific soil and climatic conditions.
2 The variety of physical (abiotic) conditions that exists on Earth gives rise to diverse environments (biomes) and allows for the existence of a wide variety of organisms (biodiversity).
3 Ecosystems are dynamic in nature; the number and types of species fluctuate over time. Disruptions, deliberate or inadvertent, to the physical (abiotic) or biological (biotic) components of an ecosystem impact the composition of an ecosystem.