

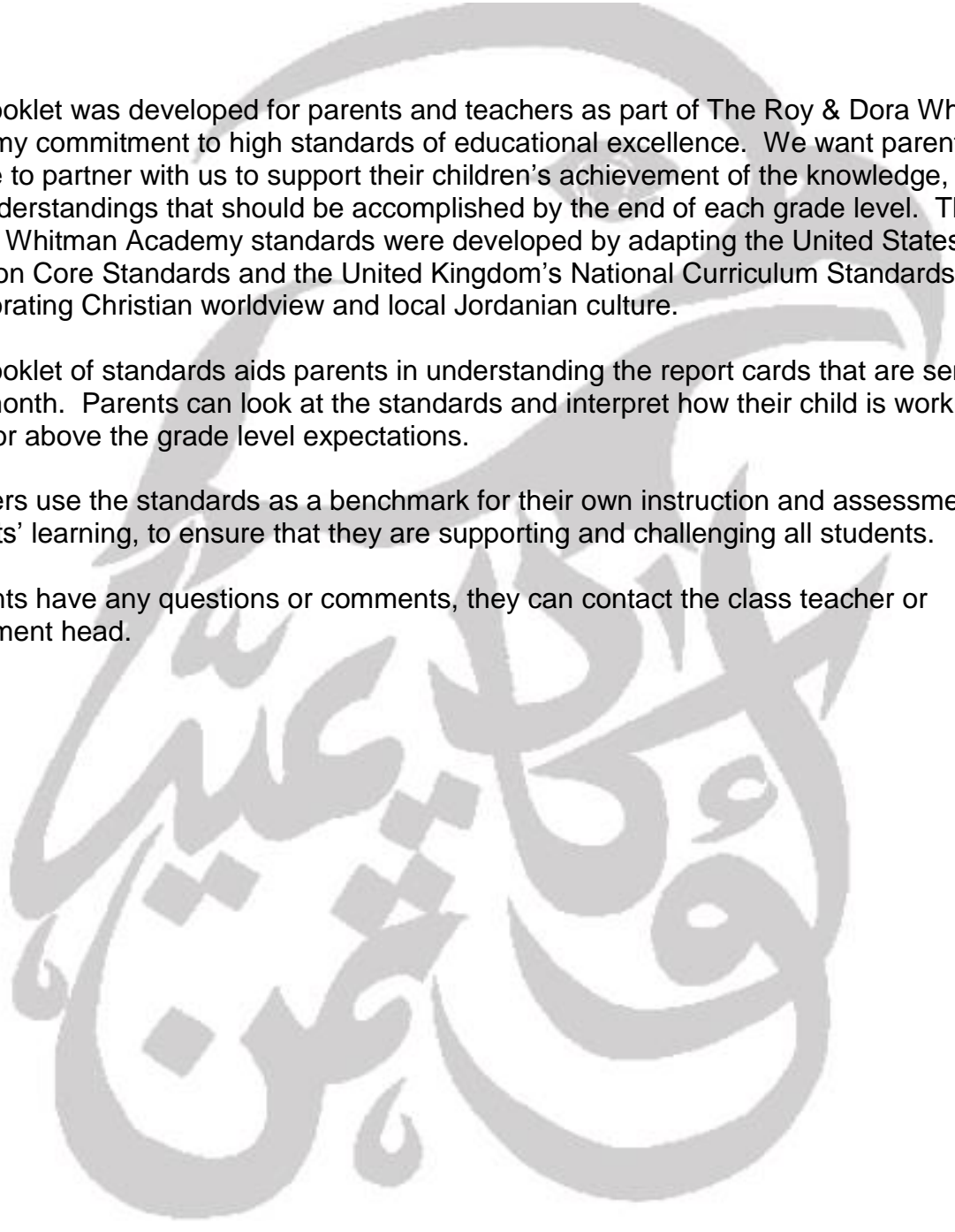


Roy & Dora

Whitman Academy

Grade Five

Standards Booklet



This booklet was developed for parents and teachers as part of The Roy & Dora Whitman Academy commitment to high standards of educational excellence. We want parents to be able to partner with us to support their children's achievement of the knowledge, skills and understandings that should be accomplished by the end of each grade level. The Roy & Dora Whitman Academy standards were developed by adapting the United States' Common Core Standards and the United Kingdom's National Curriculum Standards and incorporating Christian worldview and local Jordanian culture.

This booklet of standards aids parents in understanding the report cards that are sent out each month. Parents can look at the standards and interpret how their child is working at, below or above the grade level expectations.

Teachers use the standards as a benchmark for their own instruction and assessment of students' learning, to ensure that they are supporting and challenging all students.

If parents have any questions or comments, they can contact the class teacher or department head.

English Language

Reading
Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
Determine a theme of a story, drama, or poem from details in the text, including how characters in a story or drama respond to challenges or how the speaker in a poem reflects upon a topic; summarize the text.
Compare and contrast two or more characters, settings, or events in a story or drama, drawing on specific details in the text (e.g., how characters interact).
Determine the meaning of words and phrases as they are used in a text, including figurative language such as metaphors and similes.
Explain how a series of chapters, scenes, or stanzas fits together to provide the overall structure of a particular story, drama, or poem.
Describe how a narrator's or speaker's point of view influences how events are described.
Analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text (e.g., graphic novel, multimedia presentation of fiction, folktale, myth, poem).
Compare and contrast stories in the same genre (e.g., mysteries and adventure stories) on their approaches to similar themes and topics.
Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts.
Analyze multiple accounts of the same event or topic, noting important similarities and differences in the point of view they represent.
Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).
Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.
Read and comprehend literature and information texts, including stories, dramas, poetry, history/social studies, science and technical texts at the high end of the grades 4-5 text complexity band independently and proficiently.

Know and apply grade-level phonics and word analysis skills in decoding words.
Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.
Read grade-level text with purpose and understanding.
Read grade-level prose and poetry orally with accuracy, appropriate rate, and expression on successive readings.
Use context to confirm or self-correct word recognition and understanding, rereading as necessary.
Writing
<p>Write opinion pieces on topics or texts, supporting a point of view with reasons and information:</p> <ul style="list-style-type: none"> • Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose. • Provide logically ordered reasons that are supported by facts and details. • Link opinion and reasons using words, phrases, and clauses (e.g., <i>consequently</i>, <i>specifically</i>). • Provide a concluding statement or section related to the opinion presented.
<p>Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</p> <ul style="list-style-type: none"> • Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension. • Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. • Link ideas within and across categories of information using words, phrases, and clauses (e.g., <i>in contrast</i>, <i>especially</i>). • Use precise language and domain-specific vocabulary to inform about or explain the topic. • Provide a concluding statement or section related to the information or explanation presented.
<p>Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.</p> <ul style="list-style-type: none"> • Orient the reader by establishing a situation and introducing a narrator and/or characters; organize an event sequence that unfolds naturally. • Use narrative techniques, such as dialogue, description, and pacing, to develop experiences and events or show the responses of characters to situations. • Use a variety of transitional words, phrases, and clauses to manage the sequence of events. • Use concrete words and phrases and sensory details to convey experiences and events precisely. • Provide a conclusion that follows from the narrated experiences or events.

Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.
Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.
Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.
Draw evidence from literary or informational texts to support analysis, reflection, and research.
Write routinely over extended time frames (time for research, 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.
Speaking and Listening
Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on <i>grade 5 topics and texts</i> , building on others' ideas and expressing their own clearly. <ul style="list-style-type: none"> • Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion. • Follow agreed-upon rules for discussions and carry out assigned roles. • Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others. • Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.
Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.
Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
Adapt speech to a variety of contexts and tasks, using formal English when appropriate to task and situation.

Grammar and Punctuation

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

- Explain the function of conjunctions, prepositions, and interjections in general and their function in particular sentences.
- Form and use the perfect (e.g., I had walked; I have walked; I will have walked) verb tenses.
- Use verb tense to convey various times, sequences, states, and conditions.
- Recognize and correct inappropriate shifts in verb tense.
- Use correlative conjunctions (e.g., *either/or*, *neither/nor*).

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

- Use punctuation to separate items in a series.*
- Use a comma to separate an introductory element from the rest of the sentence.
- Use a comma to set off the words *yes* and *no* (e.g., *Yes, thank you*), to set off a tag question from the rest of the sentence (e.g., *It's true, isn't it?*), and to indicate direct address (e.g., *Is that you, Steve?*).
- Use underlining, quotation marks, or italics to indicate titles of works.
- Spell grade-appropriate words correctly, consulting references as needed.

Use knowledge of language and its conventions when writing, speaking, reading, or listening.

- Expand, combine, and reduce sentences for meaning, reader/listener interest, and style.
- Compare and contrast the varieties of English (e.g., *dialects*, *registers*) used in stories, dramas, or poems.

Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.

- Use context (e.g., cause/effect relationships and comparisons in text) as a clue to the meaning of a word or phrase.
- Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., *photograph*, *photosynthesis*).
- Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.

Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

- Interpret figurative language, including similes and metaphors, in context.
- Recognize and explain the meaning of common idioms, adages, and proverbs.
- Use the relationship between particular words (e.g., synonyms, antonyms, homographs) to better understand each of the words.

Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., *however*, *although*, *nevertheless*, *similarly*, *moreover*, *in addition*).

Math

Operations and Algebraic Thinking
Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. <i>For example, express the calculation "add 8 and 7, then multiply by 2" as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.</i>
Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. <i>For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.</i>
Number and Operations in Base Ten
Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left.
Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
Read, write, and compare decimals to thousandths. <ul style="list-style-type: none">• Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (\frac{1}{10}) + 9 \times (\frac{1}{100}) + 2 \times (\frac{1}{1000})$.• Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.
Use place value understanding to round decimals to any place.
Fluently multiply multi-digit whole numbers using the standard algorithm.
Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
Numbers and Operations in Fractions

Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)*

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$.*

Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret $3/4$ as the result of dividing 3 by 4, noting that $3/4$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $3/4$. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*

Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

- Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.)*
- *Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.*

Interpret multiplication as scaling (resizing), by:

- Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
- Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.

Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

- Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.*
- Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.*
- *Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $1/3$ -cup servings are in 2 cups of raisins?*

Measurement and Data

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Make a line plot to display a data set of measurements in fractions of a unit ($1/2$, $1/4$, $1/8$). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*

Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

- A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.
- A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.

Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

- Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
- Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.
- Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

Geometry

Graph points on the coordinate plane to solve real-world and mathematical problems.

- Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
- Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Classify two-dimensional figures into categories based on their properties.

- Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.
- Classify two-dimensional figures in a hierarchy based on properties.

Science

Physical Science

Structure and Properties of Matter

Matter is made up of tiny particles called atoms, and different arrangements of atoms into groups compose all substances.

A substance has characteristic properties, such as density, a boiling point, and solubility, all of which are independent of the amount of the sample. A mixture of substances often can be separated into the original substances using one or more of the characteristic properties. These methods include boiling, filtering, chromatography, and screening.

Chemical elements are substances containing only one kind of atom and do not break down during normal laboratory reactions involving such treatments as heating, exposure to electric current, or reaction with acids.

There are more than 100 known elements that combine in a multitude of ways to produce compounds which account for the living and nonliving substances that we encounter. Compounds may form as molecules or as crystals.

Many elements can be grouped according to similar properties (e.g. highly reactive metals, less-reactive metals, highly reactive nonmetals, almost completely nonreactive gases).

States of matter depend on molecular arrangement and motion.

Solutions are mixtures in which the solute is spread out evenly through the solvent and will not settle.

Changes of Properties in Matter

Substances react chemically in characteristic ways with other substances to form new substances with different characteristic properties.

Mass is conserved in physical and chemical change. No matter how substances within a closed system interact with one another, the total weight of the system remains the same. The same number of atoms of a single element weighs the same, no matter how the atoms are arranged.

Reaction rates are influenced by the types of substances involved, the temperature, the concentration of reactant molecules, and the amount of contact between reactant molecules.

Matter can be changed from one state to another (evaporation, boiling, melting, freezing, and condensation) by heating or cooling.

Motions and Forces

The motion of an object can be described by its position, direction of motion, and speed. That motion can be measured and represented on a graph.

An object that is not being subjected to a force will continue to move at a constant speed and in a straight line.

If more than one force acts on an object along a straight line, then the forces will reinforce or cancel one another, depending on their direction and magnitude. Unbalanced forces, such as friction, will cause changes in the speed or direction of an object's motion.

Work is done when a force moves an object. Machines make work easier, and simple machines can be combined to make more compound machines.

Every object exerts gravitational force on every other object. This force depends on the mass of the objects and their distance from one another. Gravitational force is hard to detect unless at least one of the objects, such as the Earth, has a lot of mass.

Electric currents can produce magnetic forces, and magnets can cause electric currents.

Interactions of Energy and Matter

Moving objects have kinetic energy. Stored energy is known as potential energy.

Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei, and the nature of a chemical. Energy cannot be created or destroyed but only changed from one form to another. Energy is transferred in many ways.

Heat moves in predictable ways, flowing from warmer objects to cooler ones through conduction, convection, and radiation, until both reach the same temperature.

Vibrations (e.g. sounds, earthquakes) move at different speeds in different materials, have different wavelengths, and set up wave-like disturbances that spread away from the source.

Waves (e.g. sound, seismic, water, light) have energy, interact with matter, and can transfer energy.

Light interacts with matter by transmission (including refraction), absorption, or scattering (including reflection). To see an object, light from that object — emitted by or scattered from it — must enter the eye.

Only a narrow range of wavelengths of electromagnetic radiation can be seen by the human eye. Differences of wavelength within that range of visible light are perceived as differences in color.

Electrical circuits provide a means of transferring electrical energy when heat, light, sound, and chemical changes are produced.

An electrical current needs a complete loop through which to pass. A simple electrical circuit can be formed from a battery, wire, and a complete loop.

Some materials allow current to flow easily (conductors); others do not allow current to flow (insulators).

In most chemical and nuclear reactions, energy is transferred into or out of a system. Heat, light, mechanical motion, or electricity might all be involved in such transfers.

Structure of Cells and Organisms

Living systems at all levels of organization demonstrate the complementary nature of structure and function. Important levels of organization for structure and function include cells, organs, tissues, organ systems, whole organisms, and ecosystems.

All organisms are composed of cells — the fundamental unit of life. Most organisms are single cells; other organisms are multi-cellular.

Cells convert energy obtained from food to carry on the many functions needed to sustain life. They grow and divide, thereby producing more cells. This requires that they take in nutrients, which they use to provide energy for their work and to make the materials that an organism needs.

Specialized cells perform specialized functions in multi-cellular organisms. Groups of specialized cells cooperate to form tissue, such as muscle. Different tissues are in turn grouped together to form larger functional units, called organs. Each type of cell, tissue, and organ has a distinct structure and set of functions that serve the organism as a whole.

Multi-cellular organisms have organ systems that perform specialized functions (e.g. digestion, respiration, reproduction, circulation, excretion, movement, control and coordination, protection from disease), and the functions of these systems affect one another.

Reproduction and Heredity

Reproduction is a characteristic of all living systems; because no individual organism lives forever, reproduction is essential to the continuation of every species. Some organisms reproduce sexually. Other organisms reproduce asexually. For sexually reproducing organisms, a species comprises all organisms that can mate with one another to produce fertile offspring.

In many species, including humans, females produce eggs and males produce sperm. Plants also produce sexually — the egg and sperm are produced in the flowers of flowering plants. An egg and sperm unite to begin development of a new individual. That new individual receives genetic information from its mother (via the egg) and its father (via the sperm). Sexually produced offspring never are identical to either of their parents. Sexual reproduction allows for greater genetic diversity.

In asexual reproduction, all the genes come from a single parent. Asexual reproduction limits the spread of disadvantageous characteristics through a species.

Every organism requires a set of instructions for specifying its traits. Heredity is the passage of these instructions from one generation to another.

Hereditary information is contained in genes, located in the chromosomes of each cell. Each gene carries a single unit of information. An inherited trait of an individual can be determined by one or by many genes, and a single gene can influence more than one trait. A human cell contains many thousands of different genes.

The characteristics of an organism can be described in terms of a combination of traits. Some traits are inherited through the coding of genetic material, and others result from interactions with the environment.

Regulation and Behavior of Organisms

All organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment.

Regulation of an organism's internal environment involves sensing the internal environment and changing physiologic activities to keep conditions within the range required to survive.

Behavior is one kind of response an organism can make to an internal or environmental stimulus. A behavioral response requires coordination and communication at many levels, including cells, organ systems, and whole organisms. Behavioral response is a set of actions determined in part by heredity and in part from experience, including adaptation to its environment.

Diversity and Adaptations of Organisms

Millions of species of animals, plants, and microorganisms are alive today. Although different species might look dissimilar, the unity among organisms becomes apparent from an analysis of internal structures, the similarity of their chemical processes, and the evidence of common ancestry between related species.

Living things are classified in taxonomic groups of plants, animals, and fungi. Classification is based on the details of organisms' internal and external features.

Biological evolution accounts for the diversity of species developed through gradual processes over many generations. Species acquire many of their unique characteristics through biological adaptation, which involves the selection of naturally occurring variations in populations. Biological adaptations include changes in structures, behaviors, or physiology that enhance survival and reproductive success in a particular environment

Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.

The fossil record, through geologic evidence, documents the appearance, diversification, and extinction of many life forms. Extinction of species is common; most of the species that have lived on the earth no longer exist.

Each group of organisms has a unique life cycle and has specialized anatomy for reproduction, excreting wastes, movement, and obtaining nutrients,.

Appreciation of the necessity of biodiversity is essential to develop proper attitudes of careful conservation of ecologies.

Populations and Ecosystems

A population consists of all individuals of a species that occur together at a given place and time. All populations living together and the physical factors with which they interact compose an ecosystem. Similar ecosystems are grouped into biomes.

Populations of organisms can be categorized by the function they serve in an ecosystem: producers, consumers, and decomposers. Food webs identify the relationships among producers, consumers, and decomposers in an ecosystem.

For ecosystems, the major source of energy is sunlight. Energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis. That energy passes from plants to herbivores to carnivores and decomposers in food webs.

The number of organisms an ecosystem can support depends on the resources available and abiotic factors, such as quantity of light and water, range of temperatures, and soil composition. Given adequate biotic and abiotic resources and no disease or predators, populations (including humans) increase at rapid rates.

Human beings live within the world's ecosystems and have a major effect on other species. Increasingly, humans modify ecosystems, and human destruction of habitats may irreversibly affect these ecosystems.

Jordan is home to five biomes: desert, deciduous forest, marine, wetland, and chaparral. Jordan's unique geographical position makes it home to some of the widest diversity of plant life on the planet. Many species of reptiles, fish, and mammals populate Jordan's biomes, and Jordan is a flyway for species of birds migrating between Africa and Europe.

Personal Health

Regular exercise is important to the maintenance and improvement of health. The benefits of physical fitness include maintaining healthy weight, having energy and strength for routine activities, good muscle tone, bone strength, strong heart/lung systems, and improved mental health. Personal exercise, especially developing cardiovascular endurance, is the foundation of physical fitness.

The potential for accidents and the existence of hazards imposes the need for injury prevention. Safe living involves the development and use of safety precautions and the recognition of risk in personal and social dimensions. Important personal and social decisions are made based on perceptions of benefits and risks.

The use of tobacco increases the risk of illness and has long-term detrimental effects. The influence of short-term social and psychological factors can lead to tobacco use.

Alcohol and other drugs are often abused substances. Such drugs change how the body functions and can lead to addiction.

Food provides energy and nutrients for growth and development. Nutrition requirements vary with body weight, age, sex, activity, and body functioning.

Sex drive is a natural human function that requires understanding. Sex is also a prominent means of transmitting diseases. The diseases can be prevented through a variety of precautions. Many scientific, psychological, and Biblical reasons exist to limit sexual activity to specific confines.

Natural environments may contain substances (for example, radon and lead) that are harmful to human beings. Maintaining environmental health involves establishing or monitoring quality standards related to use of soil, water, and air.

Disease is a breakdown in structures or functions of an organism. Some diseases are the result of intrinsic failures of the system. Others are the result of damage by infection by other organisms (viruses, bacteria, and parasites).

Earth and Space Science

Earth's Composition and Structure

The solid earth is layered with a lithosphere; hot, convecting mantle; and a dense, metallic core.

Lithospheric plates on the scales of continents and oceans constantly move at rates of centimeters per year in response to movements in the mantle. Major geological events, such as earthquakes, volcanic eruptions, and mountain building, result from these plate motions.

Land forms are the result of a combination of constructive and destructive forces. Constructive forces include crustal deformation, volcanic eruption, and deposition of sediment; destructive forces include weathering and erosion.

A mineral is a naturally-formed, inorganic, crystalline solid which has a definite chemical composition. Minerals can be identified based on properties such as streak, luster, cleavage, fracture, density, and hardness. Rocks are made up of minerals.

Some changes in the solid earth can be described as the "rock cycle." Sedimentary, igneous, and metamorphic rocks contain evidence of the minerals, temperatures, and forces that created them.

Soil consists of weathered rocks and decomposed organic material from dead plants, animals, and bacteria. Soils are often found in layers, with each having a different chemical composition and texture. Various factors influence soil texture, fertility, and resistance to erosion (e.g. plant roots and debris, bacteria, fungi, worms, rodents).

Living organisms have played many roles in the earth system, including affecting the composition of the atmosphere, producing some types of rocks, and contributing to the weathering of rocks.

The earth processes we see today, including erosion, movement of lithospheric plates, and changes in atmospheric composition, are assumed to be similar to those that occurred in the past. Earth history is also influenced by occasional catastrophes, such as the impact of an asteroid or comet.

Successive layers of sedimentary rock and the fossils contained within them can be used to confirm the age, history, and changing life forms of the Earth. Fossils also provide important evidence of how environmental conditions have changed on the Earth over time. This evidence can be affected by the folding, breaking, and uplifting of layers.

Jordan has unique geological features such as the Jordan Valley and the Dead Sea.

Natural Resources and Environmental Change

Human populations use resources in the environment in order to maintain and improve their existence. Energy sources can be classified as renewable (solar, wind, water, biomass) or nonrenewable (fossil fuels). The use of both types of energy sources impacts the environment.

When an area becomes overpopulated, the environment may become degraded due to the increased use of resources. Natural systems can change to an extent that exceeds the limits of organisms to adapt naturally or humans to adapt technologically. Causes of environmental degradation and resource depletion vary from region to region and from country to country.

Internal and external processes of the earth system cause natural hazards, events that change or destroy human and wildlife habitats, damage property, and harm or kill humans. Natural hazards include earthquakes, landslides, wildfires, volcanic eruptions, floods, and storms.

Human activities can induce hazards through resource acquisition, urban growth, land-use decisions, waste disposal, and pollution of air, water, soil, and food. Such activities can accelerate many natural changes.

Natural hazards can present personal and societal challenges because misidentifying the change or incorrectly estimating the rate and scale of change may result in either too little attention and significant human costs or too much cost for unneeded preventative measures.

Humans have a God-given responsibility to wisely manage the resources on this planet in a way that honors and respects the creative process of God in His provision for the human race on this planet. Human activity should result in positive, healthy interaction with the environment.

Composition and Structure of the Universe

The Earth is the third planet from the sun in a system that includes the Moon, the Sun, seven other planets and their moons, and smaller objects, such as dwarf planets, asteroids, and comets.

Most objects in the solar system are in regular and predictable motion. Motions of the Earth, Moon, and Sun explain such phenomena as the day, the year, phases of the moon, and eclipses. Planets move around the Sun in elliptical orbits.

Gravity is the force that keeps planets in orbit around the Sun and governs the rest of the motion in the solar system. Gravity alone holds us to the Earth's surface and explains the phenomena of the tides.

Each planet in our Solar System has unique characteristics. The planets differ in size, composition, and surface features. Some planets have moons and rings of particles orbiting them.

Minor bodies in the solar system are dwarf planets, asteroids, comets, each of which has unique characteristics. Meteors are bits of dust or rock which enter Earth's atmosphere.

The Sun is the closest star to Earth and the central and largest body in the Solar System. It is a medium-sized star and is located at the edge of a disk-shaped galaxy.

The Sun is the major source of energy for phenomena on the Earth's surface, such as growth of plants, winds, ocean currents, and the water cycle. The Sun's energy arrives as light with a range of wavelengths, including visible light, infrared, and ultraviolet radiation. Seasons result from variations in the amount of the Sun's energy hitting the surface, due to the tilt of the Earth's rotation on its axis and the length of the day.

Stars lose energy by emitting light and differ in brightness, size, and temperature. Stars form from clouds of gas and dust, and as they become older, they become giants. Stars eventually die as white dwarfs, neutron stars, or black holes.

The universe consists of many billions of galaxies, each containing many billions of stars. Vast distances (measured in light years) separate these galaxies and stars from one another and from the Earth.

The Earth is distinguished from other known celestial bodies in that it is the only planet known to harbor life, although similar planets might yet be discovered in the universe.

Telescopes magnify distant objects in the sky (e.g. the Moon, planets) and dramatically increase the number of stars we can see.

Skills

Scientific Inquiry

Identify and formulate questions that can be answered through scientific investigations. Refine and refocus broad and ill-defined questions by clarifying them toward objects and phenomena that can be described, explained, or predicted by scientific investigations. Identify questions with scientific ideas, concepts, and quantitative relationships that guide investigation.

Design and conduct a scientific investigation. Develop general abilities, such as observing systematically, making accurate measurements, and identifying and controlling variables. Clarify the ideas that are influencing and guiding the inquiry and make hypotheses that relate to current scientific knowledge.

Use appropriate tools and techniques to gather, analyze, and interpret data. The use of tools and techniques, including mathematics, will be guided by the question asked and the investigations students design.

Develop descriptions, explanations, predictions, and models using evidence. Students should base their explanation on what they observed, and as they develop cognitive skills, they should be able to differentiate explanation from description — providing causes for effects and establishing relationships based on evidence and logical argument. Explanations should establish connections between the content of science and the students' observations.

Think critically and logically to make the relationships between evidence and explanations including deciding what evidence should be used and accounting for anomalous data. Review data from a simple experiment, summarize the data, and form a logical argument about the cause-and-effect relationships in the experiment.

Recognize and analyze alternative explanations and predictions by evaluating the results of scientific investigations, experiments, observations, theoretical and mathematical models, and explanations proposed by other scientists. Develop the ability to listen and to respect the explanations proposed by other students, remaining open to and acknowledging different ideas and explanations, accepting the skepticism of others, and considering alternative explanations.

Communicate scientific procedures and explanations, including communicating experimental methods, following instructions, describing observations, summarizing the results of other groups, and telling other students about investigations and explanations.

Use mathematics in all aspects of scientific inquiry: asking questions; gathering, organizing, and presenting data; and structuring convincing explanations.

Technological Design

Identify appropriate problems for technological design by identifying a specified need, considering its various aspects, and talking to potential users or beneficiaries. Students should appreciate that for some needs, the cultural backgrounds and beliefs of different groups can affect the criteria for a suitable product.

Design a solution or product by making and comparing different proposals in the light of the criteria students have selected. Consider constraints - such as cost, time, tradeoffs, and materials needed - and communicate ideas with drawings and simple models.

Implement a proposed solution by organizing materials and other resources, planning the work, making good use of group collaboration where appropriate, choosing suitable tools and techniques, and working with appropriate measurement methods to ensure adequate accuracy.

Evaluate completed technological designs or products using criteria relevant to the original purpose or need, considering a variety of factors that might affect acceptability and suitability for intended users or beneficiaries, and developing measures of quality with respect to such criteria and factors. Suggest improvements and, for their own products, try proposed modifications.

Communicate the process of technological design. Review and describe any completed piece of work and identify the stages of problem identification, solution design, implementation, and evaluation.

General Lab Skills

- Follow basic safety procedures in investigations.
- Make careful observations.
- Measure time using a stopwatch.
- Measure length using a ruler.
- Measure mass using a double-pan balance.
- Measure volume using a graduated cylinder.
- Measure temperature using a thermometer.
- Observe objects and organisms with magnifiers.
- Observe the finer details of plants and animals with a microscope.

Social Studies

Geographical Knowledge and Skills
Ask geographical questions
Observe and record
Express their own views about people, places and environments
Communicate in different ways
Use geographical vocabulary
Use fieldwork skills
Use globes, maps and plans at a range of scales
Use secondary sources of information
Make maps and plans
Identify and describe what places are like
Identify and describe where places are
Recognise how places have become the way they are and how they are changing
Recognise how places compare with other places
Recognise how places are linked to other places in the world
Make observations about where things are located and about other features in the environment
Recognise changes in physical and human features
Recognise changes in the environment
Recognise how the environment may be improved and sustained
Historical Knowledge and Skills
Know and understand the history of Jordan and the wider world as a coherent, chronological narrative, from the earliest times to the present day: how people's lives have shaped the world.
Know and understand significant aspects of the history of the wider world: the nature of ancient civilisations; the expansion and dissolution of empires; characteristic features of past societies; achievements and follies of mankind.
Gain and deploy a historically grounded understanding of abstract terms such as 'empire', 'civilisation', 'parliament' and 'peasantry'.
Understand historical concepts such as continuity and change, cause and consequence, similarity, difference and significance, and use them to make connections, draw contrasts, analyse trends, frame historically valid questions and create their own structured accounts, including written narratives and analyses.

Understand the methods of historical enquiry, including how evidence is used rigorously to make historical claims, and discern how and why contrasting arguments and interpretations of the past have been constructed.

Gain historical perspective by placing their growing knowledge into different contexts: understanding the connections between local, regional, national and international history; between cultural, economic, military, political, religious and social history; and between short- and long-term timescales.

Develop a chronologically secure knowledge and understanding of local and world history, establishing clear narratives within and across the periods they study.

Note connections, contrasts and trends over time and develop the appropriate use of historical terms.

Regularly address and sometimes devise historically valid questions about change, cause, similarity and difference, and significance.

Construct informed responses that involve thoughtful selection and organisation of relevant historical information.

Understand how our knowledge of the past is constructed from a range of sources.

Art

Create sketchbooks to record observations and use them to review and revisit ideas.

Improve mastery of art and design techniques, including drawing, painting and sculpture with a range of materials.

Learn about great artists, architects and designers in history.

Develop techniques, including control and use of materials, with creativity, experimentation and increasing awareness of different kinds of art, craft and design.

Create sketchbooks to record observations and use them to review and revisit ideas.

Improve mastery of art and design techniques, including drawing, painting and sculpture with a range of materials.

Information Technology

Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.

Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.

Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

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PE (Physical Education)

Apply and develop a broad range of skills, learning how to use them in different ways and to link them to make actions and sequences of movement.

Develop an understanding of how to improve in different physical activities and sports and learn how to evaluate and recognise their own success.

Use running, jumping, throwing and catching in isolation and in combination.

Play competitive games, modified where appropriate, and apply basic principles suitable for attacking and defending.

Develop flexibility, strength, technique, control and balance [for example, through athletics and gymnastics].

Perform dances using a range of movement patterns.

Take part in outdoor and adventurous activity challenges both individually and within a team.

Compare their performances with previous ones and demonstrate improvement to achieve their personal best.

If swimming is taught, children should be taught to:

- swim competently, confidently and proficiently over a distance of at least 25 metres
- use a range of strokes effectively [for example, front crawl/freestyle, backstroke and breaststroke].
- perform safe self-rescue in different water-based situations.

Music

Play and perform in solo and ensemble context, using their voices and playing musical instruments with increasing accuracy, fluency, control and expression.

Improvise and compose music for a range of purposes using the interrelated dimensions of music.

Listen with attention to detail and recall sounds with increasing aural memory.

Use and understand staff and other musical notations.

Appreciate and understand a wide range of high-quality live and recorded music drawn from different traditions and from great composers and musicians.

Develop an understanding of the history of music.

Arabic

Classical

Conversational

Learn topic vocabulary and use in sentences: morning routine, weather, seasons, inside the house, answering the door, cultural celebrations.

Christian Education

God: Know about God's plan for all to be redeemed.

Bible: Learn how the Bible is one way in God has revealed Himself.

Bible Characters and Stories: Learn about key figures of the Old Testament: Abraham, Isaac, Joseph, Moses, Joshua, Gideon, Samson, Ruth, Samuel, Saul, David, Solomon, Elijah, Elisha, Isaiah, Jeremiah, Daniel, Ezra, Nehemiah. Learn about how God worked in their lives and used them to do His work. Know how Jesus follows on from the OT work of God.

Response: Explore different ways to respond to God's redemption. Identify ways in which God has worked in the lives of the students and teacher.

