Seventh Grade Curriculum at a Glance for Parents

Grade Seven Religion

The students will....

- Describe God and His divine attributes.
- Express confidence in God's Word as the holy and inerrant Word of God which is used to interpret itself.
- Express faith in Jesus, the Savior revealed in God's Word.
- Express an understanding of how God uses Law and Gospel to bring us to love and trust in Him.
- Demonstrate reliance on the power of the Holy Spirit to move them to lives filled with loving actions toward God and others.
- Describe God's creation and preservation of the universe.
- Demonstrate an appreciation for the victories Jesus has won for us and an understanding of the meaning of these victories for the Christian life.
- Identify righteousness as God's gift, credited to them through the merits of Christ.
- Demonstrate an understanding that God remains with His people in times of trial, providing strength and encouragement for even life's lowest moments.
- Acknowledge God's desire to forgive, restore, and equip them for lives of service by the power of the Holy Spirit.
- Demonstrate reliance on the power of the Spirit to guide them as they enjoy and rightfully use their freedom.
- Explain prayer and the confidence we have to come before God's throne in the name of Jesus.
- Recognize The Lord's Prayer as the most excellent of all prayers.
- Give thanks to God for His unfailing mercy, forgiveness, and power to live for Him.
- Rejoice in God's guidance and protection as they study the people and events recorded in God's Word.
- Demonstrate an appreciation for the means of grace as the media through which God works in the lives of His people.
- Praise God for bringing people to faith in Christ Jesus, and providing the means of grace through which the Holy Spirit creates and sustains saving faith.
- Give thanks to God for continuing to preserve His means of grace, Word and Sacraments, despite threats from within and outside the church.
- Compare Luther's opportunity to defend the Gospel with opportunities that arise today to defend the Gospel.
- Express the intent to test the spirits to see if they are faithful to the true teachings of God's Word.
- Demonstrate a desire to continue the effective use of creative means to spread the Gospel.
- Explore ways they might participate in the work of their congregations and synod.
- Demonstrate a desire to honor God in whatever vocation He has chosen for them.

Grade Seven Mathematics

Ratios and Proportional Relationships

The students will....

- Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units
- Recognize and represent proportional relationships between quantities
  - Decide whether two quantities are in a proportional relationship
  - Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships
  - Represent proportional relationships by equations
  - Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate
- Use proportional relationships to solve multistep ratio and percent problems

The Number System

- Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram
  - Describe situations in which opposite quantities combine to make 0
  - Understand $p + q$ as the number located a distance $|q|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts
  - Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts
  - Apply properties of operations as strategies to add and subtract rational numbers
- Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers
  - Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts
  - Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts
  - Apply properties of operations as strategies to multiply and divide rational numbers
  - Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats
- Solve real-world and mathematical problems involving the four operations with rational numbers

Grade Seven Mathematics

Expressions and Equations

- Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients
- Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related
- Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies
- Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities
    - Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach
    - Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem

Geometry

- Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale
- Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
- Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids
- Know the formulas for the area and circumference of a circle and solve problems; give an informal derivation of the relationship between the circumference and area of a circle
- Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and use them to solve simple equations for an unknown angle in a figure
- Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms

Grade Seven Mathematics

Statistics and Probability

- Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Under-stand that random sampling tends to produce representative samples and support valid inferences
- Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions
- Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability
- Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations
- Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event
- Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability
- Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy
    - Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events
    - Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process
- Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation
    - Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs
    - Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams
    - Design and use a simulation to generate frequencies for compound events

Grade Seven English & Language Arts

Literature

The student will...

- Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- Determine a theme or central idea of a text and analyze its development over the course of the text; provide an objective summary of the text.
- Analyze how particular elements of a story or drama interact.
- Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of rhymes and other repetitions of sounds (e.g., alliteration) on a specific verse or stanza of a poem or section of a story or drama.
- Analyze how a drama's or poem's form or structure (e.g., soliloquy, sonnet) contributes to its meaning.
- Analyze how an author develops and contrasts the points of view of different characters or narrators in a text.
- Compare and contrast a written story, drama, or poem to its audio, filmed, staged, or multimedia version, analyzing the effects of techniques unique to each medium
- Compare and contrast a fictional portrayal of a time, place, or character and a historical account of the same period as a means of understanding how authors of fiction use or alter history.
- By the end of the year, read and comprehend literature, including stories, dramas, and poems, in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range.

Informational Text

- Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text
- Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text
- Analyze the interactions between individuals, events, and ideas in a text
- Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone
- Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas
- Determine an author's point of view or purpose in a text and analyze how the author distinguishes his or her position from that of others
- Compare and contrast a text to an audio, video, or multimedia version of the text, analyzing each medium's portrayal of the subject
- Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims
- Analyze how two or more authors writing about the same topic shape their presentations of key information by emphasizing different evidence or advancing different interpretations of facts
- By the end of the year, read and comprehend literary nonfiction in the grades 6–8 text complexity band proficiently, with scaffolding as needed at the high end of the range

Grade Seven English & Language Arts

Writing Standards

- Write arguments to support claims with clear reasons and relevant evidence.
    - Introduce claim(s), acknowledge alternate or opposing claims, and organize the reasons and evidence logically.
    - Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.
    - Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), reasons, and evidence.
    - Establish and maintain a formal style.
    - Provide a concluding statement or section that follows from and supports the argument presented.
- Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
    - Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
    - Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.
    - Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts.
    - Use precise language and domain-specific vocabulary to inform about or explain the topic.
    - Establish and maintain a formal style.
    - Provide a concluding statement or section that follows from and supports the information or explanation presented.
- Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.
    - Engage and orient the reader by establishing a context and point of view and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically.
    - Use narrative techniques, such as dialogue, pacing, and description, to develop experiences, events, and/or characters.
    - Use a variety of transition words, phrases, and clauses to convey sequence and signal shifts from one time frame or setting to another.
    - Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events.
    - Provide a conclusion that follows from and reflects on the narrated experiences or events.
- Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- 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.
- Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.
- Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.

- 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
- Draw evidence from literary or informational texts to support analysis, reflection, and research.
    - Apply grade 7 Reading standards to literature
    - Apply grade 7 Reading standards to literary nonfiction
- 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 grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
    - Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.
    - Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.
    - Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.
    - Acknowledge new information expressed by others and, when warranted, modify their own views.
- Analyze the main ideas and supporting details presented in diverse media and formats and explain how the ideas clarify a topic, text, or issue under study
- Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.
- Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.
- Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.
- Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

Language

- Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
    - Explain the function of phrases and clauses in general and their function in specific sentences.
    - Choose among simple, compound, complex, and compound-complex sentences to signal differing relationships among ideas.
    - Place phrases and clauses within a sentence, recognizing and correcting misplaced and dangling modifiers.
- Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

  - Use a comma to separate coordinate adjectives
  - Spell correctly.
- Use knowledge of language and its conventions when writing, speaking, reading, or listening.
  - Choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.
- Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 7 reading and content, choosing flexibly from a range of strategies.
  - Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.
  - Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word
  - Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech.
  - Verify the preliminary determination of the meaning of a word or phrase
- Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.
  - Interpret figures of speech (e.g., literary, biblical, and mythological allusions) in context.
  - Use the relationship between particular words (e.g., synonym/antonym, analogy) to better understand each of the words.
  - Distinguish among the connotations (associations) of words with similar denotations (definitions).
- Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Grade Seven Social Studies

Introduction to Geography:

The student...

- In this unit students should address geographic elements and themes, the National Geography standards, and the National Council for the Social Studies (NCSS) Thematic strands. In addition students should interpret various types of geographic information and how geographers look at the world. In this unit students should be introduced to existing and emerging technologies in geography. Students should be able to analyze the characteristics of physical and human geography and apply this analysis to their world.

Physical Geography: Physical Features

- Physical Features : In this unit students should be introduced to physical geography with a concentration on physical features. Students should be able to analyze the characteristics of physical geography and apply this analysis to their world. Students should address geographic elements and themes, the National Geography standards, and the NCSS Thematic strands. In addition students should interpret various types of geographic information and how geographers look at the world.
- Physical Systems: In this unit students should be introduced to physical geography with a concentration on physical systems. Students should address geographic elements and themes, the National Geography standards, and the NCSS Thematic strands. In addition students should interpret various types of geographic information and how geographers look at the world. Students should be able to analyze the characteristics of physical geography and apply this analysis to their world.

Human Geography:

- Culture: In this unit students should be introduced to human geography with a concentration on culture. Students should address geographic elements and themes, the National Geography standards, and the NCSS Thematic strands. In addition students should interpret various types of geographic information and how geographers look at the world. Students should be able to analyze the characteristics of culture and apply this analysis to their world.
- Government, Economics, and Religion: In this unit students should be introduced to human geography with a concentration on government, economics, and religion. Students should address geographic elements and themes, the National Geography standards, and the NCSS Thematic strands. In addition students should interpret various types of geographic information and how geographers look at the world. Students should be able to analyze these characteristics of human geography and apply this analysis to their world.

Human Impact on the Earth and Physical Systems:

- In this unit students should be introduced to physical and human geography with a concentration on interconnectedness and interaction between human and physical systems and implications of those relationships. Students should address geographic elements and themes, the National Geography standards, and the NCSS Thematic strands. In addition, students should interpret various types of geographic information and how geographers look at the world. Students should be able to analyze the characteristics of culture and apply this analysis to their world.

Grade Seven Social Studies

Kansas History:

- Early Peoples Exploration, and Drawing Boundaries (7000 BCE—1854 CE): In this unit, students should consider the variety of peoples and cultures who inhabited what would become Kansas. Students should be asked to consider the reasons for settlement and consider beliefs, ideas, diversity, relationships between various people, relationships between people and their environment, and change over time. The bulk of the time should be spent on the contrasting cultures of early and later arriving groups (emigrant Native American groups, explorers, missionaries, and the military). Evidence from archeology and anthropology should be examined.
- Statehood and Civil War (1854—1865): In this unit, students should investigate the historical context under which the state was settled and the role Kansas played in the Civil War. The students should trace the development of state government from the territorial period through statehood. Students should deal with questions about Popular Sovereignty, slavery, and abolition.
- To the Stars through Difficulty (1865—1890s): In this unit students should consider the impact of frontier forts, railroads, cattle, farming, and immigration on the development of the state's government, economy, and culture. The students should investigate the romantic image of the West and compare and contrast that image with primary source evidence. The students should concentrate on the development of the political, economic, and cultural identity of the state.
- Progress and Reform (1860s—1920s): In this unit, students should investigate the development of specific industries within the state and critical reform movements. The bulk of the time in this unit should be spent considering the historic, economic, political, and geographic context of these developments and the conditions which existed to inspire these reforms.
- Good Times and Bad (1920s—1940s): In this unit, students should consider the boom and bust nature of the U.S. economy. Investigating the political, economic, and social context under which these conditions existed. Students should investigate the role the state and Kansans played in World War I and II. Students should spend the bulk of their time in this unit considering the causes, conditions, and remedies for the economic distress of the Great Depression.
- Kansas and a Changing World (1950s—2000s): In this unit, students should examine the role of the state as the United States develops as a world leader. Students should evaluate the changing infrastructure of the nation and its impact on Kansas. Students should investigate the impact of the Cold War on Kansas' social, economic, and political development. Students should spend time investigating the idea of civil rights in broad general terms. This unit should include the consideration of the role of Kansas, Kansans, and Brown v Topeka Board of Education in advancing civil rights.
- Kansas and a Modern World (1970s—present): In this unit, students should examine events leading up to the present and draw a contemporary picture of the state. Students should investigate how the state is positioned for the future, including an overview of the current state constitution. The bulk of their time should be spent reflecting on the state's history, drawing conclusions about our past, present, and future.

Middle School Science

Matter and Its Interactions

The Student:

- Develop models to describe the atomic composition of simple molecules and extended structures.
- Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
- Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.
- Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
- Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
- Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.

Motion and Stability: Forces and Interactions

- Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
- Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
- Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.
- Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.
- Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.

Energy

- Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
- Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.
- Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
- Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
- Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

Middle School Science

Waves and Their Applications in Technologies for Information Transfer

- Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.
- Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
- Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.

From Molecules to Organisms: Structures and Processes

- Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
- Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
- Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
- Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
- Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
- Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
- Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
- Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

Ecosystems: Interactions, Energy, and Dynamics

- Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
- Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
- Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

Middle School Science

Heredity: Inheritance and Variation of Traits

- Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.
- Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

Biological Evolution: Unity and Diversity

- Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.
- Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.
- Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.
- Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.
- Analyze how natural selection may lead to increases and decreases of specific traits in populations over time.

Earth & Space

- Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
- Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
- Analyze and interpret data to determine scale properties of objects in the solar system.

Middle School Science

Earth's Systems

- Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
- Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
- Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
- Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
- Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
- Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

Earth and Human Activity

- Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
- Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
- Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
- Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
- Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

Engineering Design

- Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific
- Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.