

Barren County Schools



6th Grade Curriculum 2017 Update

Barren County Schools

Language Arts Curriculum

READING STANDARDS FOR LITERATURE

Key Ideas and Details

1. Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
2. Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
3. Describe how a particular story's or drama's plot unfolds in a series of episodes as well as how the characters respond or change as the plot moves toward a resolution.

Craft and Structure

4. Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of a specific word choice on meaning and tone.
5. Analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text and contributes to the development of the theme, setting, or plot.
6. Explain how an author develops the point of view of the narrator or speaker in a text.

Integration of Knowledge and Ideas

7. Compare and contrast the experience of reading a story, drama, or poem to listening to or viewing an audio, video, or live version of the text, including contrasting what they "see" and "hear" when reading the text to what they perceive when they listen or watch.
8. (Not applicable to literature)
9. Compare and contrast texts in different forms or genres (e.g., stories and poems; historical novels and fantasy stories) in terms of their approaches to similar themes and topics.

Range of Reading and Level of Text Complexity

10. 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.

READING STANDARDS: INFORMATIONAL TEXT

Key Ideas and Details

1. Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

2. Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

3. Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).

Craft and Structure

4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.

5. Analyze how a particular sentence, paragraph, chapter, or section fits into the overall structure of a text and contributes to the development of the ideas.

6. Determine an author's point of view or purpose in a text and explain how it is conveyed in the text.

Integration of Knowledge and Ideas

7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

8. Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not.

9. Compare and contrast one author's presentation of events with that of another (e.g., a memoir written by and a biography on the same person).

Range of Reading and Level of Text Complexity

10. 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.

WRITING STANDARDS

Text Types and Purposes

1. Write arguments to support claims with clear reasons and relevant evidence.

a. Introduce claim(s) and organize the reasons and evidence clearly.

b. Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.

c. Use words, phrases, and clauses to clarify the relationships among claim(s) and reasons.

d. Establish and maintain a formal style.

- e. Provide a concluding statement or section that follows from the argument presented.
2. Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
 - a. Introduce a topic; 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.
 - b. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.
 - c. Use appropriate transitions to 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.
 - f. Provide a concluding statement or section that follows from the information or explanation presented.
 3. Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.
 - a. Engage and orient the reader by establishing a context and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically.
 - b. Use narrative techniques, such as dialogue, pacing, and description, to develop experiences, events, and/or characters.
 - c. Use a variety of transition words, phrases, and clauses to convey sequence and signal shifts from one time frame or setting to another.
 - d. Use precise words and phrases, relevant descriptive details, and sensory language to convey experiences and events.
 - e. Provide a conclusion that follows from the narrated experiences or events.

Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
5. 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. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grade 6 on page 52.)
6. 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 three pages in a single sitting.

Research to Build and Present Knowledge

7. Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.
8. Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.
9. Draw evidence from literary or informational texts to support analysis, reflection, and research.
 - a. Apply grade 6 Reading standards to literature (e.g., “Compare and contrast texts in different forms or genres [e.g., stories and poems; historical novels and fantasy stories] in terms of their approaches to similar themes and topics”).
 - b. Apply grade 6 Reading standards to literary nonfiction (e.g., “Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not”).

Range of Writing

10. 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 STANDARDS

Comprehension and Collaboration

1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 6 topics, texts, and issues, building on others’ ideas and expressing their own clearly.
 - a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.
 - b. Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed
 - c. Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.
 - d. Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing.
2. Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.
3. Delineate a speaker’s argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.

Presentation of Knowledge and Ideas

4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.
5. Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.
6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate. (See grade 6 Language standards 1 and 3 on page 52 for specific expectations.)

LANGUAGE STANDARDS

Conventions of Standard English

1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
 - a. Ensure that pronouns are in the proper case (subjective, objective, possessive).
 - b. Use intensive pronouns (e.g., myself, ourselves).
 - c. Recognize and correct inappropriate shifts in pronoun number and person.*
 - d. Recognize and correct vague pronouns (i.e., ones with unclear or ambiguous antecedents).*
 - e. Recognize variations from standard English in their own and others' writing and speaking, and identify and use strategies to improve expression in conventional language.*
2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
 - a. Use punctuation (commas, parentheses, dashes) to set off nonrestrictive/parenthetical elements.*
 - b. Spell correctly. Knowledge of Language
3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.
 - a. Vary sentence patterns for meaning, reader/ listener interest, and style.*
 - b. Maintain consistency in style and tone.*

Vocabulary Acquisition and Use

4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, choosing flexibly from a range of strategies.
 - a. 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.

- b. Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., audience, auditory, audible).
 - c. Consult 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.
 - d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).
5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.
- a. Interpret figures of speech (e.g., personification) in context.
 - b. Use the relationship between particular words (e.g., cause/effect, part/whole, item/category) to better understand each of the words.
 - c. Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., stingy, scrimping, economical, un wasteful, thrifty).
6. 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.

***Penmanship/Handwriting**

Student writes consistently and proficiently in cursive on the **majority** of class assignments.

*Legible penmanship, although not KCAS, will be taught/reinforced throughout elementary school.

Barren County Schools

Mathematics Curriculum

Ratios and Proportional Relationships

Understand ratio concepts and use ratio reasoning to solve problems.

6.RP.1: Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”

6.RP.2: Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.” (Note: Expectations for unit rates in this grade are limited to non-complex fractions.)

6.RP.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?

c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $30/100$ times the quantity); solve problems involving finding the whole, given a part and the percent.

d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

The Number System

Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

6.NS.1: Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for $(2/3) \div (3/4)$ and use a

visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $3/4$ -cup servings are in $2/3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3/4$ mi and area $1/2$ square mi?

Compute fluently with multi-digit numbers and find common factors and multiples.

6.NS.2: Fluently divide multi-digit numbers using the standard algorithm.

6.NS.3: Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

6.NS.4: Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express $36 + 8$ as $4(9 + 2)$. Apply and extend previous understandings of numbers to the system of rational numbers.

6.NS.5: Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. 6.NS.6: Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.

b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

6.NS.7: Understand ordering and absolute value of rational numbers.

a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret $-3 > -7$ as a statement that -3 is located to the right of -7 on a number line oriented from left to right.

b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write $-3^\circ \text{C} > -7^\circ \text{C}$ to express the fact that -3°C is warmer than -7°C .

c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of -30 dollars, write $|-30| = 30$ to

describe the size of the debt in dollars.

d. Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.

6.NS.8: Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Expressions and Equations

Apply and extend previous understandings of arithmetic to algebraic expressions.

6.EE.1: Write and evaluate numerical expressions involving whole-number exponents. 6.EE.2: Write, read, and evaluate expressions in which letters stand for numbers.

a. Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as $5 - y$.

b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms.

c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.

6.EE.3: Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$.

6.EE.4: Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.

Reason about and solve one-variable equations and inequalities.

6.EE.5: Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

6.EE.6: Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

6.EE.7: Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers.

6.EE.8: Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem.

Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Represent and analyze quantitative relationships between dependent and independent variables.

6.EE.9: Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable.

Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.

Geometry

Solve real-world and mathematical problems involving area, surface area, and volume.

6.G.1: Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

6.G.2: Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

6.G.3: Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and

mathematical problems.

6.G.4: Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Develop understanding of statistical variability.

6.SP.1: Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, “How old am I?” is not a statistical question, but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages.

6.SP.2: Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

6.SP.3: Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

Summarize and describe distributions.

6.SP.4: Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

6.SP.5: Summarize numerical data sets in relation to their context, such as by:

- a. Reporting the number of observations.
- b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
- c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
- d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

Barren County Schools

Science Curriculum

MS.Structure and Properties of Matter

MS.Structure and Properties of Matter	
Students who demonstrate understanding can:	
06-PS1-1.	Develop models to describe the atomic composition of simple molecules and extended structures. [Clarification Statement: Emphasis is on developing models of molecules that vary in complexity. Examples of simple molecules could include ammonia and methanol. Examples of extended structures could include sodium chloride or diamonds. Examples of molecular-level models could include drawings, 3D ball and stick structures or computer representations showing different molecules with different types of atoms.] [Assessment Boundary: Assessment does not include valence electrons and bonding energy, discussing the ionic nature of subunits of complex structures, or a complete depiction of all individual atoms in a complex molecule or extended structure.]
06-PS1-3.	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. [Clarification Statement: Emphasis is on natural resources that undergo a chemical process to form the synthetic material. Examples of new materials could include new medicine, foods, and alternative fuels.] [Assessment Boundary: Assessment is limited to qualitative information.]
06-PS1-4.	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. [Clarification Statement: Emphasis is on qualitative molecular-level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of state occurs. Examples of models could include drawings and diagrams. Examples of particles could include molecules or inert atoms. Examples of pure substances could include water, carbon dioxide, and helium.]

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.</p> <ul style="list-style-type: none"> Develop a model to predict and/or describe phenomena. (06-PS1-1),(06-PS1-4) <p>Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 6–8 builds on K–5 and progresses to evaluating the merit and validity of ideas and methods.</p> <ul style="list-style-type: none"> Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. (06-PS1-3) 	<p>PS1.A: Structure and Properties of Matter</p> <ul style="list-style-type: none"> Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms. (06-PS1-1) Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. (06-PS1-3) (Note: This Disciplinary Core Idea is also addressed by 07-PS1-2.) Gases and liquids are made of molecules or inert atoms that are moving about relative to each other. (06-PS1-4) In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations. (06-PS1-4) Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals). (06-PS1-1) The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter. (06-PS1-4) <p>PS1.B: Chemical Reactions</p> <ul style="list-style-type: none"> Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants. (06-PS1-3) (Note: This Disciplinary Core Idea is also addressed by 07-PS1-2 and 07-PS1-5.) <p>PS3.A: Definitions of Energy</p> <ul style="list-style-type: none"> The term “heat” as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. (secondary to 06-PS1-4) The temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule (whichever is the appropriate building block for the system’s material). The details of that relationship depend on the type of atom or molecule and the interactions among the atoms in the material. Temperature is not a direct measure of a system’s total thermal energy. The total thermal energy (sometimes called the total internal energy) of a system depends jointly on the temperature, the total number of atoms in the system, and the state of the material. (secondary to 06-PS1-4) 	<p>Cause and Effect</p> <ul style="list-style-type: none"> Cause and effect relationships may be used to predict phenomena in natural or designed systems. (06-PS1-4) <p>Scale, Proportion, and Quantity</p> <ul style="list-style-type: none"> Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (06-PS1-1) <p>Structure and Function</p> <ul style="list-style-type: none"> Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. (06-PS1-3) <hr/> <p>Connections to Engineering, Technology, and Applications of Science</p> <p>Interdependence of Science, Engineering, and Technology</p> <ul style="list-style-type: none"> Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (06-PS1-3) <p>Influence of Science, Engineering and Technology on Society and the Natural World</p> <ul style="list-style-type: none"> The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time. (06-PS1-3)
Connections to other DCIs in this grade-band: MS.LS2.A (06-PS1-3); MS.LS4.D (06-PS1-3); MS.ESS2.C (06-PS1-1),(06-PS1-4); MS.ESS3.A (06-PS1-3); MS.ESS3.C (06-PS1-3)		
Articulation across grade-bands: 5.PS1.A (06-PS1-1); HS.PS1.A (06-PS1-1),(06-PS1-3),(06-PS1-4); HS.PS1.B (06-PS1-4); HS.PS3.A (06-PS1-4); HS.LS2.A (06-PS1-3); HS.LS4.D (06-PS1-3); HS.ESS1.A (06-PS1-1); HS.ESS3.A (06-PS1-3)		
Common Core State Standards Connections:		
ELA/Literacy –		
RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions (06-PS1-3)	
RST.6-8.7	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). (06-PS1-1),(06-PS1-4)	
WHST.6-8.8	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. (06-PS1-3)	
Mathematics –		
MP.2	Reason abstractly and quantitatively. (06-PS1-1)	

MS.Structure and Properties of Matter

MP.4	Model with mathematics. (06-PS1-1)
6.RP.A.3	Use ratio and rate reasoning to solve real-world and mathematical problems. (06-PS1-1)
6.NS.C.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. (06-PS1-4)
8.EE.A.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. (06-PS1-1)

MS. Forces and Interactions

MS. Forces and Interactions		
<p>Students who demonstrate understanding can:</p> <p>06-PS2-1. Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects.* [Clarification Statement: Examples of practical problems could include the impact of collisions between two cars, between a car and stationary objects, and between a meteor and a space vehicle.] [Assessment Boundary: Assessment is limited to vertical or horizontal interactions in one dimension.]</p> <p>06-PS2-2. 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. [Clarification Statement: Emphasis is on balanced (Newton’s First Law) and unbalanced forces in a system, qualitative comparisons of forces, mass and changes in motion (Newton’s Second Law), frame of reference, and specification of units.] [Assessment Boundary: Assessment is limited to forces and changes in motion in one-dimension in an inertial reference frame, and to change in one variable at a time. Assessment does not include the use of trigonometry.]</p>		
<p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Asking Questions and Defining Problems Asking questions and defining problems in grades 6–8 builds from grades K–5 experiences and progresses to specifying relationships between variables, and clarifying arguments and models.</p> <p>Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in 6–8 builds on K–5 experiences and progresses to include investigations that use <u>multiple variables</u> and provide evidence to support explanations or design solutions. Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim. (06-PS2-2)</p> <p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. Apply scientific ideas or principles to design an object, tool, process or system. (06-PS2-1)</p> <p>Engaging in Argument from Evidence Engaging in argument from evidence in 6–8 builds from K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world.</p> <p style="text-align: center;">----- Connections to Nature of Science -----</p> <p>Scientific Knowledge is Based on Empirical Evidence Science knowledge is based upon logical and conceptual connections between evidence and explanations. (06-PS2-2),(07-PS2-4)</p>	<p>PS2.A: Forces and Motion For any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction (Newton’s third law). (06-PS2-1) The motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change. The greater the mass of the object, the greater the force needed to achieve the same change in motion. For any given object, a larger force causes a larger change in motion. (06-PS2-2) All positions of objects and the directions of forces and motions must be described in an arbitrarily chosen reference frame and arbitrarily chosen units of size. In order to share information with other people, these choices must also be shared. (06-PS2-2)</p>	<p>Systems and System Models Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy and matter flows within systems. (06-PS2-1),</p> <p>Stability and Change Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and forces at different scales. (06-PS2-2)</p> <p style="text-align: center;">----- Connections to Engineering, Technology, and Applications of Science -----</p> <p>Influence of Science, Engineering, and Technology on Society and the Natural World The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. (06-PS2-1)</p>
<p><i>Connections to other DCIs in this grade-band:</i> MS.PS3.A (06-PS2-2); MS.PS3.B (06-PS2-2); MS.PS3.C (06-PS2-1); MS.ESS1.A (07-PS2-4); MS.ESS1.B (06-PS2-2),(07-PS2-4); MS.ESS2.C (06-PS2-2),(07-PS2-4)</p>		
<p><i>Articulation across grade-bands:</i> 3.PS2.A (06-PS2-1),(06-PS2-2); 3.PS2.B (07-PS2-3),(07-PS2-5); 5.PS2.B (07-PS2-4); HS.PS2.A (06-PS2-1),(06-PS2-2); HS.PS2.B (07-PS2-3),(07-PS2-4),(07-PS2-5); HS.PS3.A (07-PS2-5); HS.PS3.B (06-PS2-2),(07-PS2-5); HS.PS3.C (07-PS2-5); HS.ESS1.B (07-PS2-4)</p>		

MS. Forces and Interactions - Continued

Kentucky Academic Standards Connections:

ELA/Literacy–

- RST.6-8.1** Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions *(06-PS2-1),(07-PS2-3)*
- RST.6-8.3** Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. *(06-PS2-1),(06-PS2-2),(07-PS2-5)*
- WHST.6-8.1** Write arguments focused on discipline-specific content. *(07-PS2-4)*
- WHST.6-8.7** 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. *(06-PS2-1),(06-PS2-2),(07-PS2-5)*

Mathematics–

- MP.2** Reason abstractly and quantitatively. *(06-PS2-1),(06-PS2-2),(07-PS2-3)*
- 6.NS.C.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. *(06-PS2-1)*
- 6.EE.A.2** Write, read, and evaluate expressions in which letters stand for numbers. *(06-PS2-1),(06-PS2-2)*
- 7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, 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. *(06-PS2-1),(06-PS2-2)*
- 7.EE.B.4** 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. *(06-PS2-1),(06-PS2-2)*

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The section entitled "Disciplinary Core Ideas" is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas. Integrated and reprinted with permission from the National Academy of Sciences.

MS.Matter and Energy in Organisms and Ecosystems

MS.Matter and Energy in Organisms and Ecosystems

Students who demonstrate understanding can:

- 06-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.** [Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.]
- 06-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.** [Clarification Statement: Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems, and on defining the boundaries of the system.] [Assessment Boundary: Assessment does not include the use of chemical reactions to describe the processes.]

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices

Developing and Using Models

Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.

- Develop a model to describe phenomena. (06-LS2-3)

Analyzing and Interpreting Data

Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.

- Analyze and interpret data to provide evidence for phenomena. (06-LS2-1)

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific knowledge, principles, and theories.

Engaging in Argument from Evidence

Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).

Connections to Nature of Science

Scientific Knowledge is Based on Empirical Evidence

Disciplinary Core Ideas

LS2.A: Interdependent Relationships in Ecosystems

- Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (06-LS2-1)
- In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. (06-LS2-1)
- Growth of organisms and population increases are limited by access to resources. (06-LS2-1)

LS2.B: Cycle of Matter and Energy Transfer in Ecosystems

- Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (06-LS2-3)

Crosscutting Concepts

Cause and Effect

- Cause and effect relationships may be used to predict phenomena in natural or designed systems. (06-LS2-1)

Energy and Matter

- The transfer of energy can be tracked as energy flows through a natural system. (06-LS2-3)

Stability and Change

Connections to Nature of Science

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

- Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation. (06-LS2-3)

Connections to other DCIs in this grade-band: **MS.PS1.B** (07-LS1-6),(07-LS1-7),(06-LS2-3); **MS.LS4.C** (08-LS2-4); **MS.LS4.D** (08-LS2-4); **MS.ESS2.A** (07-LS1-6),(06-LS2-3),(08-LS2-4); **MS.ESS3.A** (06-LS2-1),(08-LS2-4); **MS.ESS3.C** (06-LS2-1),(08-LS2-4)

Articulation across grade-bands: **3.LS2.C** (06-LS2-1),(08-LS2-4); **3.LS4.D** (06-LS2-1),(08-LS2-4); **5.PS3.D** (07-LS1-6),(07-LS1-7); **5.LS1.C** (07-LS1-6),(07-LS1-7); **5.LS2.A** (07-LS1-6),(06-LS2-1),(06-LS2-3); **5.LS2.B** (07-LS1-6),(07-LS1-7),(06-LS2-3); **HS.PS1.B** (07-LS1-6),(07-LS1-7); **HS.PS3.B** (06-LS2-3); **HS.LS1.C** (07-LS1-6),(07-LS1-7),(06-LS2-3);

MS.Matter and Energy in Organisms and Ecosystems

HS.LS2.A (06-LS2-1); **HS.LS2.B** (07-LS1-6),(07-LS1-7),(06-LS2-3); **HS.LS2.C** (08-LS2-4); **HS.LS4.C** (06-LS2-1),(08-LS2-4); **HS.LS4.D** (06-LS2-1),(08-LS2-4); **HS.ESS2.A** (06-LS2-3); **HS.ESS2.D** (07-LS1-6); **HS.ESS2.E** (08-LS2-4); **HS.ESS3.A** (06-LS2-1); **HS.ESS3.B** (08-LS2-4); **HS.ESS3.C** (08-LS2-4)

Common Core State Standards Connections:

ELA/Literacy –

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (07-LS1-6),(06-LS2-1),(08-LS2-4)

RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. (07-LS1-6)

RST.6-8.7 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). (06-LS2-1)

WHST.6-8.1 Write arguments to support claims with clear reasons and relevant evidence. (08-LS2-4)

WHST.6-8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (07-LS1-6)

WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research. (07-LS1-6),(08-LS2-4)

SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (07-LS1-7),(06-LS2-3)

Mathematics –

6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (07-LS1-6),(06-LS2-3)

MS.Space Systems

MS.Space Systems

Students who demonstrate understanding can:

- 06-ESS1-1. 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.** [Clarification Statement: Examples of models can be physical, graphical, or conceptual.]
- 06-ESS1-2. Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.** [Clarification Statement: Emphasis for the model is on gravity as the force that holds together the solar system and Milky Way galaxy and controls orbital motions within them. Examples of models can be physical (such as the analogy of distance along a football field or computer visualizations of elliptical orbits) or conceptual (such as mathematical proportions relative to the size of familiar objects such as their school or state).] [Assessment Boundary: Assessment does not include Kepler's Laws of orbital motion or the apparent retrograde motion of the planets as viewed from Earth.]
- 06-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.** [Clarification Statement: Emphasis is on the analysis of data from Earth-based instruments, space-based telescopes, and spacecraft to determine similarities and differences among solar system objects. Examples of scale properties include the sizes of an object's layers (such as crust and atmosphere), surface features (such as volcanoes), and orbital radius. Examples of data include statistical information, drawings and photographs, and models.] [Assessment Boundary: Assessment does not include recalling facts about properties of the planets and other solar system bodies.]

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices

Developing and Using Models

Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.

- Develop and use a model to describe phenomena. (06-ESS1-1),(06-ESS1-2)

Analyzing and Interpreting Data

Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.

- Analyze and interpret data to determine similarities and differences in findings. (06-ESS1-3)

Disciplinary Core Ideas

ESS1.A: The Universe and Its Stars

- Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models. (06-ESS1-1)
- Earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe. (06-ESS1-2)

ESS1.B: Earth and the Solar System

- The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them. (06-ESS1-2),(06-ESS1-3)
- This model of the solar system can explain eclipses of the sun and the moon. Earth's spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year. (06-ESS1-1)
- The solar system appears to have formed from a disk of dust and gas, drawn together by gravity. (06-ESS1-2)

Crosscutting Concepts

Patterns

- Patterns can be used to identify cause and effect relationships. (06-ESS1-1)

Scale, Proportion, and Quantity

- Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (06-ESS1-3)

Systems and System Models

- Models can be used to represent systems and their interactions. (06-ESS1-2)

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology

- Engineering advances have led to important discoveries in virtually every field of science and scientific discoveries have led to the development of entire industries and engineered systems. (06-ESS1-3)

Connections to Nature of Science

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

- Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation. (06-ESS1-1),(06-ESS1-2)

Connections to other DCIs in this grade-band: **MS.PS2.A** (06-ESS1-1),(06-ESS1-2); **MS.PS2.B** (06-ESS1-1),(06-ESS1-2); **MS.ESS2.A** (06-ESS1-3)

Articulation of DCIs across grade-bands: **3.PS2.A** (06-ESS1-1),(06-ESS1-2); **5.PS2.B** (06-ESS1-1),(06-ESS1-2); **5.ESS1.A** (06-ESS1-2); **5.ESS1.B** (06-ESS1-1),(06-ESS1-2),(06-ESS1-3); **HS.PS2.A** (06-ESS1-1),(06-ESS1-2); **HS.PS2.B** (06-ESS1-1),(06-ESS1-2); **HS.ESS1.A** (06-ESS1-2); **HS.ESS1.B** (06-ESS1-1),(06-ESS1-2),(06-ESS1-3); **HS.ESS2.A** (06-ESS1-3)

Common Core State Standards Connections:

ELA/Literacy –

- RST.6-8.1** Cite specific textual evidence to support analysis of science and technical texts. (06-ESS1-3)
- RST.6-8.7** 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). (06-ESS1-3)

- SL.8.5** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points. (06-ESS1-1),(06-ESS1-2)

Mathematics –

- MP.2** Reason abstractly and quantitatively. (06-ESS1-3)
- MP.4** Model with mathematics. (06-ESS1-1),(06-ESS1-2)
- 6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (06-ESS1-1),(06-ESS1-2),(06-ESS1-3)
- 7.RP.A.2** Recognize and represent proportional relationships between quantities. (06-ESS1-1),(06-ESS1-2),(06-ESS1-3)
- 6.EE.B.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (06-ESS1-2)
- 7.EE.B.4** 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. (06-ESS1-2)

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

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MS.History of Earth

MS.History of Earth

Students who demonstrate understanding can:

- 06-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.** [Clarification Statement: Emphasis is on how processes change Earth's surface at time and spatial scales that can be large (such as slow plate motions or the uplift of large mountain ranges) or small (such as rapid landslides or microscopic geochemical reactions), and how many geoscience processes (such as earthquakes, volcanoes, and meteor impacts) usually behave gradually but are punctuated by catastrophic events. Examples of geoscience processes include surface weathering and deposition by the movements of water, ice, and wind. Emphasis is on geoscience processes that shape local geographic features, where appropriate.]
- 06-ESS2-3. Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.** [Clarification Statement: Examples of data include similarities of rock and fossil types on different continents, the shapes of the continents (including continental shelves), and the locations of ocean structures (such as ridges, fracture zones, and trenches).] [Assessment Boundary: Paleomagnetic anomalies in oceanic and continental crust are not assessed.]

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices

Analyzing and Interpreting Data

Analyzing data in 6–8 builds on K–5 and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.

- Analyze and interpret data to provide evidence for phenomena. (06-ESS2-3)

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

- Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (08-ESS1-4),(06-ESS2-2)

Connections to Nature of Science

Scientific Knowledge is Open to Revision in Light of New Evidence

- Science findings are frequently revised and/or reinterpreted based on new evidence. (06-ESS2-3)

Disciplinary Core Ideas

ESS1.C: The History of Planet Earth

- Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. (HS.ESS1.C GBE) (secondary to 06-ESS2-3)

ESS2.A: Earth's Materials and Systems

- The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future. (06-ESS2-2)

ESS2.B: Plate Tectonics and Large-Scale System Interactions

- Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart. (06-ESS2-3)

ESS2.C: The Roles of Water in Earth's Surface Processes

- Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations. (06-ESS2-2)

Crosscutting Concepts

Patterns

- Patterns in rates of change and other numerical relationships can provide information about natural systems. (06-ESS2-3)

Scale Proportion and Quantity

Connections to other DCIs in this grade-band: **MS.PS1.B** (06-ESS2-2); **MS.LS2.B** (06-ESS2-2); **MS.LS4.A** (08-ESS1-4),(06-ESS2-3); **MS.LS4.C** (08-ESS1-4)

Articulation of DCIs across grade-bands: **3.LS4.A** (08-ESS1-4),(06-ESS2-3); **3.LS4.C** (08-ESS1-4); **3.ESS3.B** (06-ESS2-3); **4.ESS1.C** (08-ESS1-4),(06-ESS2-2),(06-ESS2-3); **4.ESS2.A** (06-ESS2-2); **4.ESS2.B** (06-ESS2-3); **4.ESS2.E** (06-ESS2-2); **4.ESS3.B** (06-ESS2-3); **5.ESS2.A** (06-ESS2-2); **HS.PS1.C** (08-ESS1-4); **HS.PS3.D** (06-ESS2-2); **HS.LS2.B** (06-ESS2-2); **HS.LS4.A** (08-ESS1-4),(06-ESS2-3); **HS.LS4.C** (08-ESS1-4),(06-ESS2-3); **HS.ESS1.C** (08-ESS1-4),(06-ESS2-2),(06-ESS2-3); **HS.ESS2.A** (08-ESS1-4),(06-ESS2-2),(06-ESS2-3); **HS.ESS2.B** (06-ESS2-2),(06-ESS2-3); **HS.ESS2.C** (06-ESS2-2); **HS.ESS2.D** (06-ESS2-2); **HS.ESS2.E** (06-ESS2-2); **HS.ESS3.D** (06-ESS2-2)

Common Core State Standards Connections:

ELA/Literacy –

- RST.6-8.1** Cite specific textual evidence to support analysis of science and technical texts. (08-ESS1-4),(06-ESS2-2),(06-ESS2-3)
- RST.6-8.7** 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). (06-ESS2-3)
- RST.6-8.9** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (06-ESS2-3)
- WHST.6-8.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (08-ESS1-4),(06-ESS2-2)
-
- MP.2** Reason abstractly and quantitatively. (06-ESS2-2),(06-ESS2-3)
- 6.EE.B.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (08-ESS1-4),(06-ESS2-2),(06-ESS2-3)

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

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MS.Earth's Systems

MS.Earth's Systems

Students who demonstrate understanding can:

- 06-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.** [Clarification Statement: Emphasis is on the processes of melting, crystallization, weathering, deformation, and sedimentation, which act together to form minerals and rocks through the cycling of Earth's materials.] [Assessment Boundary: Assessment does not include the identification and naming of minerals.]
- 06-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.** [Clarification Statement: Emphasis is on the ways water changes its state as it moves through the multiple pathways of the hydrologic cycle. Examples of models can be conceptual or physical.] [Assessment Boundary: A quantitative understanding of the latent heats of vaporization and fusion is not assessed.]

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.</p> <ul style="list-style-type: none"> Develop and use a model to describe phenomena. (06-ESS2-1) Develop a model to describe unobservable mechanisms. (06-ESS2-4) <p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.</p> <ul style="list-style-type: none"> (08-ESS3-1) 	<p>ESS2.A: Earth's Materials and Systems</p> <ul style="list-style-type: none"> All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. (06-ESS2-1) <p>ESS2.C: The Roles of Water in Earth's Surface Processes</p> <ul style="list-style-type: none"> Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land. (06-ESS2-4) Global movements of water and its changes in form are propelled by sunlight and gravity. (06-ESS2-4) <p>ESS3.A: Natural Resources</p> <ul style="list-style-type: none"> (08-ESS3-1) 	<p>Cause and Effect</p> <ul style="list-style-type: none"> (08-ESS3-1) <p>Energy and Matter</p> <ul style="list-style-type: none"> Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter. (06-ESS2-4) <p>Stability and Change</p> <ul style="list-style-type: none"> Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale. (06-ESS2-1) <p>-----</p> <p>Connections to Engineering, Technology and Applications of Science</p> <p>Influence of Science, Engineering, and Technology on Society and the Natural World</p> <ul style="list-style-type: none"> All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (08-ESS3-1)

Connections to other DCIs in this grade-band: **MS.PS1.A** (06-ESS2-1),(06-ESS2-4),(08-ESS3-1); **MS.PS1.B** (06-ESS2-1),(08-ESS3-1); **MS.PS2.B** (06-ESS2-4); **MS.PS3.A** (06-ESS2-4); **MS.PS3.B** (06-ESS2-1); **MS.PS3.D** (06-ESS2-4); **MS.LS2.B** (06-ESS2-1); **MS.LS2.C** (06-ESS2-1); **MS.ESS1.B** (06-ESS2-1); **MS.ESS2.D** (08-ESS3-1); **MS.ESS3.C** (06-ESS2-1)

Articulation of DCIs across grade-bands: **3.PS2.A** (06-ESS2-4); **4.PS3.B** (06-ESS2-1),(06-ESS2-4); **4.PS3.D** (08-ESS3-1); **4.ESS2.A** (06-ESS2-1); **4.ESS3.A** (08-ESS3-1); **5.PS2.B** (06-ESS2-4); **5.ESS2.A** (06-ESS2-1); **5.ESS2.C** (06-ESS2-4); **HS.PS1.B** (06-ESS2-1); **HS.PS2.B** (06-ESS2-4); **HS.PS3.B** (06-ESS2-1),(06-ESS2-4),(08-ESS3-1); **HS.PS4.B** (06-ESS2-4); **HS.LS1.C** (06-ESS2-1),(08-ESS3-1); **HS.LS2.B** (06-ESS2-1); **HS.ESS2.A** (06-ESS2-1),(06-ESS2-4),(08-ESS3-1); **HS.ESS2.B** (08-ESS3-1); **HS.ESS2.C** (06-ESS2-1),(06-ESS2-4),(08-ESS3-1); **HS.ESS2.D** (06-ESS2-4); **HS.ESS2.E** (06-ESS2-1); **HS.ESS3.A** (08-ESS3-1)

Common Core State Standards Connections:

ELA/Literacy –

- RST.6-8.1** Cite specific textual evidence to support analysis of science and technical texts. (08-ESS3-1)
- WHST.6-8.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (08-ESS3-1)
- WHST.6-8.9** Draw evidence from informational texts to support analysis, reflection, and research. (08-ESS3-1)
- SL.8.5** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points. (06-ESS2-1)

Mathematics –

- 6.EE.B.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (08-ESS3-1)
- 7.EE.B.4** 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. (08-ESS3-1)

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

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MS.Interdependent Relationships in Ecosystems

MS.Interdependent Relationships in Ecosystems

Students who demonstrate understanding can:

06-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

[Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.]

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices

Constructing Explanations and Designing Solutions

Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

- Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena. (06-LS2-2)

Engaging in Argument from Evidence

Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).

Disciplinary Core Ideas

LS2.A: Interdependent Relationships in Ecosystems

- Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. (06-LS2-2)

Crosscutting Concepts

Patterns

- Patterns can be used to identify cause and effect relationships. (06-LS2-2)

Stability and Change

Connections to Engineering, Technology, and Applications of Science

Influence of Science, Engineering, and Technology on Society and the Natural World

-

Connections to Nature of Science

Science Addresses Questions About the Natural and Material World

Connections to other DCIs in this grade-band: **MS.LS1.B** (06-LS2-2); **MS.ESS3.C** (08-LS2-5)

Articulation across grade-band: **1.LS1.B** (06-LS2-2); **HS.LS2.A** (06-LS2-2),(08-LS2-5); **HS.LS2.B** (06-LS2-2); **HS.LS2.C** (08-LS2-5); **HS.LS2.D** (06-LS2-2); **LS4.D** (08-LS2-5); **HS.ESS3.A** (08-LS2-5); **HS.ESS3.C** (08-LS2-5); **HS.ESS3.D** (08-LS2-5)

Common Core State Standards Connections:

ELA/Literacy –

- RST.6-8.1** Cite specific textual evidence to support analysis of science and technical texts. (06-LS2-2)
- RST.6-8.8** Distinguish among facts, reasoned judgment based on research findings, and speculation in a text. (08-LS2-5)
- RI.8.8** 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. (08-LS2-5)
- WHST.6-8.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (06-LS2-2)
- WHST.6-8.9** Draw evidence from literary or informational texts to support analysis, reflection, and research. (06-LS2-2)
- SL.8.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly. (06-LS2-2)
- SL.8.4** Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation. (06-LS2-2)

Mathematics –

- MP.4** Model with mathematics. (08-LS2-5)
- 6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems. (08-LS2-5)
- 6.SP.B.5** Summarize numerical data sets in relation to their context. (06-LS2-2)

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MS.Weather and Climate

MS.Weather and Climate

Students who demonstrate understanding can:

06-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. [Clarification Statement: Emphasis is on how air masses flow from regions of high pressure to low pressure, causing weather (defined by temperature, pressure, humidity, precipitation, and wind) at a fixed location to change over time, and how sudden changes in weather can result when different air masses collide. Emphasis is on how weather can be predicted within probabilistic ranges. Examples of data can be provided to students (such as weather maps, diagrams, and visualizations) or obtained through laboratory experiments (such as with condensation).] [Assessment Boundary: Assessment does not include recalling the names of cloud types or weather symbols used on weather maps or the reported diagrams from weather stations.]

06-ESS2-6. 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. [Clarification Statement: Emphasis is on how patterns vary by latitude, altitude, and geographic land distribution. Emphasis of atmospheric circulation is on the sunlight-driven latitudinal banding, the Coriolis effect, and resulting prevailing winds; emphasis of ocean circulation is on the transfer of heat by the global ocean convection cycle, which is constrained by the Coriolis effect and the outlines of continents. Examples of models can be diagrams, maps and globes, or digital representations.] [Assessment Boundary: Assessment does not include the dynamics of the Coriolis effect.]

The performance expectations above were developed using the following elements from the NRC document A Framework for K-12 Science Education:

Science and Engineering Practices

Asking Questions and Defining Problems

Asking questions and defining problems in 6–8 builds on K–5 experiences and progresses to specifying relationships between variables, clarify arguments and models.

- Ask questions to identify and clarify evidence of an argument. (08-ESS3-5)

Developing and Using Models

Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.

- Develop and use a model to describe phenomena. (06-ESS2-6)

Planning and Carrying Out Investigations

Planning and carrying out investigations in 6–8 builds on K–5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or solutions.

- Collect data to produce data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions. (06-ESS2-5)

Disciplinary Core Ideas

ESS2.C: The Roles of Water in Earth’s Surface Processes

- The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns. (06-ESS2-5)
- Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents. (06-ESS2-6)

ESS2.D: Weather and Climate

- Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns. (06-ESS2-6)
- Because these patterns are so complex, weather can only be predicted probabilistically. (06-ESS2-5)
- The ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents. (06-ESS2-6)

ESS3.D: Global Climate Change (8th Grade)

Crosscutting Concepts

Cause and Effect

- Cause and effect relationships may be used to predict phenomena in natural or designed systems. (06-ESS2-5)

Systems and System Models

- Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy, matter, and information flows within systems. (06-ESS2-6)

Stability and Change

- 8th Grade

Connections to other DCIs in this grade-band: **MS.PS1.A** (06-ESS2-5); **MS.PS2.A** (06-ESS2-5),(06-ESS2-6); **MS.PS3.A** (06-ESS2-5),(08-ESS3-5); **MS.PS3.B** (06-ESS2-5),(06-ESS2-6); **MS.PS4.B** (06-ESS2-6)

Articulation of DCIs across grade-bands: **3.PS2.A** (06-ESS2-6); **3.ESS2.D** (06-ESS2-5),(06-ESS2-6); **5.ESS2.A** (06-ESS2-5),(06-ESS2-6); **HS.PS2.B** (06-ESS2-6); **HS.PS3.B** (06-ESS2-6),(08-ESS3-5); **HS.PS3.D** (06-ESS2-6); **HS.PS4.B** (08-ESS3-5); **HS.ESS1.B** (06-ESS2-6); **HS.ESS2.A** (06-ESS2-6),(08-ESS3-5); **HS.ESS2.C** (06-ESS2-5); **HS.ESS2.D** (06-ESS2-5),(06-ESS2-6),(08-ESS3-5); **HS.ESS3.C** (08-ESS3-5); **HS.ESS3.D** (08-ESS3-5)

Common Core State Standards Connections:

ELA/Literacy –

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (06-ESS2-5),(08-ESS3-5)

RST.6-8.9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (06-ESS2-5)

WHST.6-8.8 Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources. (06-ESS2-5)

SL.8.5 Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points. (06-ESS2-6)

Mathematics –

MP.2 Reason abstractly and quantitatively. (06-ESS2-5),(08-ESS3-5)

6.NS.C.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. (06-ESS2-5)

6.EE.B.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (08-ESS3-5)

7.EE.B.4 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. (08-ESS3-5)

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MS. Engineering Design

MS. Engineering Design	
Students who demonstrate understanding can:	
MS-ETS1-1.	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
MS-ETS1-2.	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
MS-ETS1-3.	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.
MS-ETS1-4.	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.

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Asking Questions and Defining Problems Asking questions and defining problems in grades 6–8 builds on grades K–5 experiences and progresses to specifying relationships between variables, clarify arguments and models. Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. (MS-ETS1-1)</p> <p>Developing and Using Models Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs. (MSETS1-4)</p> <p>Analyzing and Interpreting Data Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. Analyze and interpret data to determine similarities and differences in findings. (MS-ETS1-3)</p> <p>Engaging in Argument from Evidence Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world. Evaluate competing design solutions based on jointly developed and agreed-upon design criteria. (MS-ETS1-2)</p>	<p>ETS1.A: Defining and Delimiting Engineering Problems The more precisely a design task’s criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. (MS-ETS1-1)</p> <p>ETS1.B: Developing Possible Solutions A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (MS-ETS1-4) There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-2), (MS-ETS1-3) Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (MS-ETS1-3) Models of all kinds are important for testing solutions. (MSETS1-4)</p> <p>ETS1.C: Optimizing the Design Solution Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design. (MS-ETS1-3) The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (MS-ETS1-4)</p>	<p>Influence of Science, Engineering, and Technology on Society and the Natural World All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MSETS1-1) The uses of technologies and limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. (MS-ETS1-1)</p>

Connections to MS-ETS1.A: Defining and Delimiting Engineering Problems include:

Physical Science: MS-PS3-3

Connections to MS-ETS1.B: Developing Possible Solutions Problems include:

Physical Science: MS-PS1-6, MS-PS3-3, **Life Science:** MS-LS2-5

Connections to MS-ETS1.C: Optimizing the Design Solution include:

Physical Science: MS-PS1-6

Articulation of DCIs across grade-bands: 3-5.ETS1.A (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3); 3-5.ETS1.B (MS-ETS1-2),(MS-ETS1-3),(MS-ETS1-4); 3-5.ETS1.C (MS-ETS1-1),(MSETS1-2),(MS-ETS1-3),(MS-ETS1-4); HS.ETS1.A (MS-ETS1-1),(MS-ETS1-2); HS.ETS1.B (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3),(MS-ETS1-4); HS.ETS1.C (MS-ETS1-3),(MS-ETS1-4)

MS. Engineering Design - Continued

Kentucky Academic Standards Connections:

ELA/Literacy –

RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts. <i>(MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3)</i>
RST.6-8.7	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). <i>(MS-ETS1-3)</i>
RST.6-8.9	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. <i>(MS-ETS1-2),(MS-ETS1-3)</i>
WHST.6-8.7	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. <i>(MS-ETS1-2)</i>
WHST.6-8.8	Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources. <i>(MS-ETS1-1)</i>
WHST.6-8.9	Draw evidence from informational texts to support analysis, reflection, and research. <i>(MS-ETS1-2)</i>
SL.8.5	Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points. <i>(MS-ETS1-4)</i>
<i>Mathematics –</i>	
MP.2	Reason abstractly and quantitatively. <i>(MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3),(MS-ETS1-4)</i>
7.EE.3	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. <i>(MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3)</i>
7.SP	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. <i>(MS-ETS1-4)</i>

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Barren County Schools

Social Studies Curriculum

Big Idea: Government and Civics

The study of government and civics equips students to understand the nature of government and the unique characteristics of American democracy, including its fundamental principles, structure, and the role of citizens. Understanding the historical development of structures of power, authority, and governance and their evolving functions in contemporary U.S. society and other parts of the world is essential for developing civic competence. An understanding of civic ideals and practices of citizenship is critical to full participation in society and is a central purpose of the social studies.

Big Idea: Cultures and Societies

Culture is the way of life shared by a group of people, including their ideas and traditions. Cultures reflect the values and beliefs of groups in different ways (e.g., art, music, literature, religion); however, there are universals connecting all cultures. Culture influences viewpoints, rules, and institutions in a global society. Students should understand that people form cultural groups throughout the United States and the World, and that issues and challenges unite and divide them.

Big Idea: Economics

Economics includes the study of production, distribution and consumption of goods and services. Students need to understand how their economic decisions affect them, others, the nation and the world. The purpose of economic education is to enable individuals to function effectively both in their own personal lives and as citizens and participants in an increasingly connected world economy. Students need to understand the benefits and costs of economic interaction and interdependence among people, societies, and governments.

Big Idea: Geography

Geography includes the study of the five fundamental themes of location, place, regions, movement and human/environmental interaction. Students need geographic knowledge to analyze issues and problems to better understand how humans have interacted with their environment over time, how geography has impacted settlement and population, and how geographic factors influence climate, culture, the economy and world events. A geographic perspective also enables students to better understand the past and present and to prepare for the future.

Big Idea: Historical Perspective

History is an account of events, people, ideas, and their interaction over time that can be interpreted through multiple perspectives. In order for students to understand the present and plan for the future, they must understand the past. Studying history engages students in the lives, aspirations, struggles, accomplishments and failures of real people. Students need to think in an historical context in order to understand significant ideas, beliefs, themes, patterns and events, and how individuals and societies have changed over time in Kentucky, the United States and the World.

Note to sixth grade teachers: It is very important when studying geography for students to understand the organizers and be able to apply them across world regions (e.g., Europe, Russia, Middle East, Asia, South Pacific, Africa, and the Americas). When teachers are studying Asia, for example, they should look for examples in Asia of the geographic organizers and not focus on every country within Asia. For example, consider the organizer, "Regions." When applying this organizer to the study of Asia, students should explore the human and physical characteristics that help to define Asia as a world region. It would be impossible for teachers to explore every country within Asia, apply each core content standard, and accomplish anything but a superficial study of the region. However, a deep study of the organizers supported by the core content standards is recommended. The application of the organizers should be focused on the present day.

Asia

Essential Questions:

- a. How have geographic features influenced past decisions in Asia?
- b. How can the 5 themes of geography be used to interpret and evaluate the impact of human settlement and the interaction of humans with their environment in Asia?
- c. How have economic factors impacted societies and governments in Asia?
- d. What role does government play in Asia?
- e. How can man benefit from developing a greater appreciation of Asia?
- f. Why is it important to study the history of Ancient India and China?
- g. What role did geography play in the development of Ancient India and China?
- h. How are cultural elements and social institutions reflected in ancient civilizations of India and China?
- i. What is the influence of government and economics on the rise and fall of Ancient China and India?

- The student will demonstrate an understanding of modern governments of Eastern Asia and be able to describe the structure of the

national governments of India, Indonesia, China, and Japan.

- The student will evaluate the impact of government policies and individual behaviors on Asia's environment.
- The student will describe the factors that cause economic growth and examine their presence or absence in Southern and Eastern Asian countries such as Pakistan, India, China, and Indonesia.
- The student will describe different economic systems (traditional, command, market, mixed) and how they answer the basic economic questions (What to produce? How to produce? For whom to produce?) and explain the basic types of economic systems found in India, China, and Japan
- The student will explain the impact of location, climate, physical characteristics, natural resources, and population size on Southern and Eastern Asian countries.
- The student will describe the diverse cultural characteristics of the people who live in Southern and Eastern Asia.
- The student will explain the impact of location, climate, physical characteristics, natural resources on Asia.
- The student will describe the diverse cultural characteristics of the people who live in Asia. and population size on Asian countries.
- The student will be able to describe and locate important physical and human characteristics in Southern and Eastern Asia.
- The student will explain the growth and development of Southern and Eastern Asia.
- The student will describe the policies of China that led to isolation and the reaction to western desire to trade with China.
- The student will describe the major developments in eastern Asia during the 20th century.

Africa

Essential Questions:

1. How have geographic features influenced past decisions in Africa?
2. How can the 5 themes of geography be used to interpret and evaluate the impact of human settlement and the interaction of humans with their environment in Africa?
3. How have economic factors impacted societies and governments in Africa?
4. What role does government play in Africa?
5. How can man benefit from developing a greater appreciation of Africa?
6. Why is it important to study the history of Ancient Egypt?
7. What role did geography play in the development of Ancient Egypt?
8. How are cultural elements and social institutions reflected in Ancient Egyptian civilization?
9. What is the influence of government and economics on the rise and fall of Ancient Egypt?

- The student will demonstrate an understanding of the modern governments of Africa.
- The student will describe different economic systems (traditional, command, market, mixed) and how they answer the basic economic questions (What to produce? How to produce? For whom to produce?) and explain the basic types of economic systems found in South Africa, Egypt, Nigeria, and Morocco.
- The student will give examples of how voluntary trade benefits buyers and sellers in Africa over time.
- The student will describe the factors that influence economic growth and examine their presence or absence in such African countries as Chad, South Africa, Nigeria, and Kenya.
- The student will be able to describe and locate the important physical and human characteristics of Africa.
- The student will discuss the impact of government policies and individual behaviors on the African environment.
- The student will explain the impact of location, climate, physical characteristics, natural resources, and population size on African countries.
- The student will describe the cultural characteristics of different people who live in Africa.
- The student will identify important African empires.
- The student will explain the reasons for the African independence movement.
- The student will describe major developments in Africa since independence.

Americas

Essential Questions:

1. How have geographic features influenced past decisions in the Americas?
2. How can the 5 themes of geography be used to interpret and evaluate the impact of human settlement and the interaction of humans with their environment in the Americas?
3. How have economic factors impacted societies and governments in the Americas?
4. What role does government play in the Americas?
5. How can man benefit from developing a greater appreciation of Americas?
 - The student will explain the structure of national governments in Latin America and the Caribbean and Canada.
 - The student will describe different economic systems (traditional, command, market, mixed) and how they answer the basic economic questions (What to produce? How to produce? For whom to produce?) and explain the basic types of economic systems found in Canada, Mexico, Cuba, and Argentina.
 - The student will give examples of how voluntary trade benefits buyers and sellers in Latin America and the Caribbean and Canada.
 - The student will describe the factors that influence economic growth and examine their presence or absence in countries such as Canada, Mexico, Brazil, and Argentina.
 - The student will be able to describe and locate the important physical and human characteristics of Latin America and the Caribbean and Canada.
 - The student will discuss the impact of government policies and individual behaviors on Latin American and the Caribbean and Canadian environments.
 - The student will explain the impact of location, climate, physical characteristics, natural resources, and population size on Latin America and the Caribbean and Canada.
 - The student will describe the cultural characteristics of Latin America and the Caribbean and Canada.
 - The student will explain the development of Latin America and the Caribbean and Canada as colonies of European nations and on through their independence.
 - The student will analyze important 20th century issues in Latin America and the Caribbean and in Canada.

Europe

Essential Questions:

1. How have geographic features influenced past decisions in Europe?
2. How can the 5 themes of geography be used to interpret and evaluate the impact of human settlement and the interaction of humans with their environment in Europe?
3. How have economic factors impacted societies and governments in Europe?
4. What role does government play in Europe?
5. How can man benefit from developing a greater appreciation of Europe?
 - The student will describe modern European governments.
 - The student will describe different economic systems (traditional, command, market, mixed) and how they answer the basic economic questions (What to produce? How to produce? For whom to produce?) and explain the basic types of economic systems found in England, Germany, and Russia.
 - The student will give examples of how voluntary trade benefits buyers and sellers in Europe.
 - The student will describe the factors that cause economic growth and examine their presence or absence in countries such as England, Germany, Russia, Poland, and Romania.
 - The student will be able to describe and locate the important physical and human characteristics of Europe.
 - The student will discuss the impact of government policies and individual behaviors on the European environment.
 - The student will explain the impact of location, climate, physical characteristics, natural resources, and population size on Europe.
 - The student will describe the cultural characteristics of Europe.
 - The student will describe the civilizations at the time of the Columbian Exchange and the impact of European exploration on those civilizations.
 - The student will describe major developments in Europe during the 20th century.

Middle East

Essential Questions:

1. How have geographic features influenced past decisions in the Middle East?
2. How can the 5 themes of geography be used to interpret and evaluate the impact of human settlement and the interaction of humans with their environment in the Middle East?
3. How have economic factors impacted societies and governments in the Middle East?
4. What role does government play in the Middle East?
5. How can man benefit from developing a greater appreciation of the Middle East?
 - The student will describe the different political structures of the Middle East.
 - The student will describe different economic systems (traditional, command, market, mixed) and how they answer the basic economic questions (What to produce? How to produce? For whom to produce?) and explain the basic types of economic systems found in Israel, Saudi Arabia, and Turkey.
 - The student will describe the factors that influence economic growth and examine their presence or absence in Middle Eastern countries such as Israel, Lebanon, Turkey, Israel, Saudi Arabia, and Iran.
 - The student will be able to describe and locate important physical and human characteristics in Southwestern Asia (Middle East).
 - The student will describe the development of the three major religions that originated in the Middle East.
 - The student will describe major developments in the Middle East during the 20th century.

Oceania

Essential Questions:

1. How have geographic features influenced past decisions in Oceania?
2. How can the 5 themes of geography be used to interpret and evaluate the impact of human settlement and the interaction of humans with their environment in Oceania?
3. How have economic factors impacted societies and governments in Oceania?
4. What role does government play in Oceania?
5. How can man benefit from developing a greater appreciation of Oceania?
 - The student will describe the political structures of Oceania.
 - The student will describe the factors that influence economic growth and examine their presence or absence in Australia and Oceania.
 - The student will describe different economic systems (traditional, command, market, mixed) and how they answer the basic economic questions (What to produce? How to produce? For whom to produce?) and explain the basic types of economic systems found in Australia and the Federated States of Micronesia
 - The student will give examples of how voluntary trade benefits buyers and sellers in Australia and Oceania.
 - The student will discuss the impact of government policies and individual behaviors on the environments of Australia and Oceania.
 - The student will explain the impact of location, climate, physical characteristics, natural resources, and population size on Australia and Oceania.
 - The student will describe the cultural characteristics of Australia and Oceania.
 - The student will be able to describe and locate the important physical and human characteristics of Australia and Oceania.
 - The student will describe the culture and development of Australia and Oceania prior to contact with Europeans.
 - The student will explain the impact European exploration and colonization had on Australia and Oceania.
 - The student will discuss the impact of important 20th century events on Australia and Oceania.

Mountains and Mountain Ranges

Major mountain ranges

South America: Andes

North America: Rockies and Appalachians

Asia: Himalayas and Urals Africa: Atlas Mountains Europe: Alps High mountains of the world

Asia: Everest

North America: McKinley

South America: Aconcagua Europe: Mont Blanc Africa: Kilimanjaro

Great Lakes of the World

- Eurasia: Caspian Sea
- Asia: Aral Sea
- Africa: Victoria, Tanganyika, Chad
- North America: Superior, Huron, Michigan
- South America: Maracaibo, Titicaca

Barren County Schools

Practical Living

Big Idea: Personal Wellness (Health Education)

Wellness is maximum well-being or total health. Personal wellness is a combination of physical, mental, emotional, spiritual and social well-being. It involves making behavioral choices and decisions each day that promote an individual's physical well-being, the prevention of illnesses and diseases, and the ability to remain, physically, mentally, spiritually, socially and emotionally healthy.

Academic Expectations

2.29 Students demonstrate skills that promote individual well-being and healthy family relationships.

2.31 Students demonstrate the knowledge and skills they need to remain physically healthy and to accept responsibility for their own physical well-being.

2.32 Students demonstrate strategies for becoming and remaining mentally and emotionally healthy.

3.2 Students demonstrate the ability to maintain a healthy lifestyle.

4.1 Students effectively use interpersonal skills.

4.4 Students demonstrate the ability to accept the rights and responsibilities for self and others.

5.1 Students use critical thinking skills such as analyzing, prioritizing, categorizing, evaluating and comparing to solve a variety of problems in real-life situations.

5.4 Students use a decision-making process to make informed decisions among options.

Grade 6 Enduring Knowledge – Understandings

Students will understand that

it is important to assume responsibility for personal health.

interactions with others are an integral part of the human life experience and contribute to healthy relationships.

the environment, lifestyle, family history, peers and other factors impact physical, social, mental and emotional health.

culture, values (e.g., individual, family, community) media and use of technology (e.g., television, computers, MP3 Players, electronic/arcade games) can influence personal behavioral choices games can influence personal health.

behavioral choices affect physical, mental, emotional and social well-being and can have positive or negative consequences on one's health.

positive health habits can help prevent injuries and the spreading of diseases to self and others.

self-management and coping strategies can enhance mental and emotional health.

a variety of resources are available to inform, treat and counsel individuals with physical, mental, social and emotional health needs.

Grade 6 Skills and Concepts – Personal and Physical Health

Students will

understand the importance of assuming responsibility for personal health behaviors:

predict how decisions regarding health behaviors (e.g., hygiene, diet, exercise) have consequences for self and others

analyze personal decisions that impact an individual's emotional, sexual and reproductive health (e.g., abstinence)

explain how rights and responsibilities are interrelated

explore and analyze how an individual's behaviors and choices of diet, exercise and rest affect the body

analyze various communication methods and barriers for expressing health information and ideas

Grade 6 Skills and Concepts – Growth and Development

Students will

apply strategies and skills needed to obtain personal health goals during adolescence and

identify the physical, social and emotional changes (e.g., growth spurts, peer influence, self-confidence, mood swings) that occur during adolescence

explain basic structures and function of the reproductive system

Big Idea: Personal Wellness (Health Education) – Continued

Grade 6 Skills and Concepts – Social, Mental and Emotional Health

Students will

demonstrate social interaction skills by:
using appropriate means to express needs, wants and feelings
using and describe the importance of effective social interaction skills (e.g., respect, self-advocacy, cooperation, communication, identifying and being open to different perspectives and points of view, empathy, friendship)
recommending effective strategies for responding to stress, conflict, peer pressure and bullying
interpreting how individuals impact the effective functioning of groups
demonstrate the ability to apply a decision-making process to health issues and problems individually and collaboratively
identify common social and emotional problems (aggression, anxiety, depression, grief) and describe self-management and coping strategies (goal setting, refusal skills, decision making and time management) for addressing these problems

Grade 6 Skills and Concepts – Family and Community Health

Students will

analyze how personal health choices, individual well-being and use of health services can be influenced by:
family traditions/values
technology and media messages
cultural beliefs
physical, social and emotional environments
information from peers

Grade 6 Skills and Concepts – Communicable, Non-Communicable and Chronic Diseases Prevention

Students will

demonstrate an understanding of diseases by:
describing symptoms, causes, patterns of transmission, prevention and treatments of communicable diseases (colds, flu, mononucleosis, hepatitis, HIV/STD, tuberculosis)
describing symptoms, causes, patterns of transmission, prevention and treatments of non-communicable diseases (cancer, cardiovascular disease, diabetes, obesity, asthma, emphysema)
investigate family history, environment, lifestyle and other risk factors related to the cause or prevention of disease and other health problems
demonstrate an understanding of how to maintain a healthy body by:
explaining how health is influenced by the interaction of body systems (e.g., reproductive, digestive, circulatory, skeletal, respiratory)
describing ways pathogens from the environment (e.g., air, food, people) enter the body and explaining how body defenses fight pathogens
explaining how personal hygiene practices affect physical, mental/emotional and social health; explaining how personal health habits (e.g., hand washing, care of teeth and eyes, sun protection) affect self and others in the prevention and spread of disease
identifying health care providers and describing reasons for preventive care

Big Idea: Personal Wellness (Health Education) – Continued

Grade 6 Skills and Concepts – Alcohol, Tobacco and Other Drugs

Students will

demonstrate an understanding of the use and misuse of alcohol, tobacco and other drugs by:
distinguishing between legal (e.g., over the counter, prescription drugs) and illegal drugs (e.g., inhalants, marijuana, stimulants, depressants) and describing how their usage affects the body systems
describing the immediate and long-term effects of alcohol and drug usage and the impact on physical, mental, emotional and social health (e.g., effects on family life)
identifying resources available to individuals seeking treatment or counseling for negative behaviors or addictions

Big Idea: Nutrition (Health Education)

Proper nutrition is critical to good health. To maintain a healthy weight, good dietary habits and physical activity are essential. Nutritious foods are necessary for growth, development and maintenance of healthy bodies.

Academic Expectations

- 2.29** Students demonstrate skills that promote individual well-being and healthy family relationships.
- 2.31** Students demonstrate the knowledge and skills they need to remain physically healthy and to accept responsibility for their own physical well-being.
- 2.32** Students demonstrate strategies for becoming and remaining mentally and emotionally healthy.
- 3.2** Students demonstrate the ability to maintain a healthy lifestyle.
- 4.1** Students effectively use interpersonal skills.
- 4.4** Students demonstrate the ability to accept the rights and responsibilities for self and others.
- 5.1** Students use critical thinking skills such as analyzing, prioritizing, categorizing, evaluating and comparing to solve a variety of problems in real-life situations.
- 5.4** Students use a decision-making process to make informed decisions among options.

Grade 6 Enduring Knowledge – Understandings

Students will understand that

proper nutrition is essential to growth and development.
nutrients have a role in the development of an individual's health.
resources are available to assist in making nutritional choices.
individuals, families and community values influence nutritional choices.

Grade 6 Skills and Concepts

Students will

identify the role of nutrients and food sources which are important in the growth and development of healthy bodies
explain the role of nutrition on the body systems impacting growth and development
interpret, explain and apply the recommendations of national resources (e.g., Food Guide Pyramid (FGP), Dietary Guidelines for Americans, National Dairy Council) in making healthful food choices for a balanced diet
analyze factors (e.g., geography, convenience, cost, advertising) that influence healthy food choices
explain the role of nutrition on the body systems impacting the growth and development of healthy bodies
use the nutritional information provided on food labels to explain how it can impacts dietary choices

Big Idea: Safety (Health Education)

Accidents are a major cause of injury and death to children and adolescents. Unintentional injuries involving motor vehicle, falls, drowning, fires, firearms and poisons can occur at home, school and work. Safe behavior protects a person from danger and lessens the effects of harmful situations.

Academic Expectations

- 2.31** Students demonstrate the knowledge and skills they need to remain physically healthy and to accept responsibility for their own physical well-being.
- 2.33** Students demonstrate the skills to evaluate and use services and resources available in their community.
- 3.2** Students will demonstrate the ability to maintain a healthy lifestyle.
- 4.3** Students individually demonstrate consistent, responsive and caring behavior.
- 4.4** Students demonstrate the ability to accept the rights and responsibilities for self and others.
- 5.1** Students use skills such as analyzing, prioritizing, categorizing, evaluating and comparing to solve a variety of problems in real-life situations.
- 5.4** Students use a decision-making process to make informed decisions among-options.

Grade 6 Enduring Knowledge – Understandings

Students will understand that

safety practices and procedures help to prevent injuries and provide a safe environment.
community and state resources are available to assist in hazardous situations.
proper procedures must be used in emergency situations.

Grade 6 Skills and Concepts

Students will

explain reasons for safety practices (e.g., walking in opposite direction of violence, staying calm in dangerous situations) for dealing with a variety of health hazards (e.g., firearms, motorized vehicles or potentially unsafe or threatening situations) encountered by adolescents
describe potential hazards in and around the home and school explain how to prevent injuries
Identify and practice safety procedures needed for emergencies (e.g., tornado, fire, earthquake) at home and school
recognize life threatening emergencies and identify basic first-aid procedures for responding to a variety of life-threatening emergencies (e.g., choking, broken bones, shock, poisons, burns, allergic reactions, bleeding)
describe how to avoid dangerous situations involving strangers, fires and internet safety
identify local and state health/safety agencies (e.g., health department, fire department, state police, hospital transport services) and the services they provide
access and use reliable resources on safety guidelines for avoiding injuries and dangerous situations
identify and practice communications skills needed in emergency situations

Big Idea: Psychomotor Skills (Physical Education)

Cognitive information can be used to understand and enhance the development of motor skills such as movement sequences and patterns. Individuals who understand their bodies and how to perform various movements will be safer and more productive in recreation and work activities. Development of psychomotor skills contributes to the development of social and cognitive skills.

Academic Expectations

2.31 Students demonstrate the knowledge and skills they need to remain physically healthy and to accept responsibility for their own physical well-being.

2.34 Students perform physical movements skills effectively in a variety of settings.

2.35 Students demonstrate knowledge and skills that promote physical activity and involvement in physical activity throughout lives.

4.1 Students effectively use interpersonal skills.

Grade 6 Enduring Knowledge – Understandings

Students will understand that

movement concepts, principles, strategies and tactics apply to the learning and performance of physical activities.

motor skills need to be refined, combined and varied in the development of specialized skills (e.g., serving, catching with a glove, dribbling, punting).

Grade 6 Skills and Concepts

Students will

identify and apply principles of motor skill refinement (e.g. accuracy, technique, movement) that are necessary for skill development

demonstrate a variety of locomotor and combination skills in a movement pattern

use non-locomotor, locomotor and combination skills to demonstrate movements in creative sequences and in simple patterned dances, games and other activities

demonstrate a variety of non-locomotor, locomotor and combination skills while participating in different games and sports

demonstrate refined manipulative skills of throwing, catching, kicking and striking while developing motor skills (e.g., sliding, running, jumping) for use in games and other activities that lead to more complex games and sports (e.g., long jump, hurdles, volleyball, soccer, softball)

demonstrate how transitional motor skills (e.g., punting, serving, dribbling) are influenced by space, force and time

Big Idea: Lifetime Physical Wellness (Physical Education)

Lifetime wellness is health-focused. The health-related activities and content utilized are presented to help students become more responsible for their overall health status, and to prepare each student to demonstrate knowledge and skills that promote physical activity throughout their lives. Physical education uses physical activity as a means to help students acquire skills, fitness, knowledge and attitudes that contribute to their optimal development and well-being. Physical, mental, emotional and social health is strengthened by regular involvement in physical activities.

Academic Expectations

- 2.31** Students demonstrate the knowledge and skills they need to remain physically healthy and to accept responsibility for their own physical well-being.
- 2.34** Students perform physical movements skills effectively in a variety of settings.
- 2.35** Students demonstrate knowledge and skills that promote physical activity and involvement in physical activity throughout lives.
- 3.1** Students demonstrate positive growth in self-concept through appropriate tasks or projects.
- 3.2** Students demonstrate the ability to maintain a healthy lifestyle.
- 3.7** Students demonstrate the ability to learn on one's own.
- 4.2** Students use productive team membership skills.

Grade 6 Enduring Knowledge – Understandings

Students will understand that

leisure/recreational or competitive physical activities provide opportunities for self-expression, social interactions and can be enjoyable and challenging.
intrinsic values and other benefits (physical, emotional/mental, social) are gained by regular participation in leisure/recreational or competitive activities.
techniques, strategies and practice are important for improving performance of sport skills.
rules impact effective participation in physical activities.
personal and social behavior that shows respect to self and others impacts enjoyment and safety in physical activity settings.
regular participation in health-related, physical activity supports the goals of fitness and a healthier lifestyle throughout life.
fitness principles and techniques are used to improve/maintain physical health.

Big Idea: Lifetime Physical Wellness (Physical Education) – Continued

Grade 6 Skills and Concepts

Students will

identify several moderate to vigorous physical activities that provide personal pleasure
explain the physical, emotional/mental and social value in participating in physical activity
describe the physical, emotional/mental and social benefits gained from regular participation in leisure/recreational or competitive physical activities
recognize through participation in a variety of activities that personal skill development results from prior experiences, natural ability and practice
describe the relationship between effort and improvement in skills gained from physical activities
participate regularly in physical activity
when participating in a variety of physical activities, sports and games:
identify and apply rules of behavior and fair play (e.g., accepting authoritative decisions, assessing one's own performance level, accepting skills and abilities of others through verbal and nonverbal actions for spectators and/or participants)
demonstrate sportsmanship, cooperation, teamwork and conflict resolution
identify and use appropriate safety principles, rules, procedures and etiquette
identify offensive and defensive strategies used in games and sports
identify and assess activities that enhance the health related fitness components (muscular strength, muscular endurance, flexibility, body composition, cardio respiratory endurance)
explain the meaning of the F.I.T.T. Principle (Frequency, Intensity, Type, Time) and examine their impact on improving personal fitness
identify and assess lifetime activities (e.g., biking, hiking, horseback riding, swimming) that enhance the health-related fitness components (muscular strength, muscular endurance, flexibility, body composition, cardio respiratory endurance)
investigate how the systems of the body affect an individual's personal fitness level

Barren County Schools

Vocational Studies

Big Idea: Consumer Decisions

Individual and families need to make consumer decisions due to the numerous products/services on the market, multiple advertising techniques, and the need to make responsible financial management decisions. Accessing and assessing consumer information, comparing and evaluating products and services, provides basis for making effective consumer decisions. Consumer decisions influence the use of resources and the impact they have on the community and environment.

Academic Expectations

2.30 Students evaluate consumer products and services and make effective consumer decisions.

2.33 Students demonstrate the skills to evaluate and use services and resources available in their community.

4.4 Students demonstrate the ability to accept the rights and responsibilities for self and others.

5.4 Students use a decision-making process to make informed decisions among options.

Grade 6 Enduring Knowledge – Understandings

Students will understand that

economic and social factors affect consumer decisions.

culture, media and technology can influence consumer decisions.

consumer advocacy groups impact consumer's rights and responsibilities.

consumer actions (e.g., reusing, reducing, recycling) influence the use of resources and impact the environment.

advocacy is important for personal, family and community health and safety issues.

Big Idea: Consumer Decisions – Continued

Grade 6 Skills and Concepts

Students will

evaluate economic and social concepts and why they are important for consumer decisions by:
analyzing the differences between needs and wants and how individuals and families make choices
determining ways in which goods and services used by families impact the environment
applying decision-making strategies when buying products
comparing and evaluating products and services based on major factors (e.g., price, quality, features)
when making consumer decisions
comparing the relationship between supply and demand and their role in meeting consumer needs
investigate how culture, media and technology can influence consumer decisions by:
explaining how culture, media and technology impact the family and consumer decision-making
identifying and explaining ways consumer's buying practices are influenced by peer pressure, desire for status and advertising techniques (e.g., bandwagon, facts and figures, emotional appeal, endorsement/testimonials)
exploring the positive and negative effects of advertising and explain the impact they have on consumer decisions
explain ways consumer rights and responsibilities are protected (e.g., government agencies, consumer protection agencies, consumer action groups)
evaluate ways consumer actions (e.g., reusing, reducing, recycling) influence the use of resources and impact the environment by:
using resources from home, school, and community that provide accurate and relevant health information
describing the influence of environmental factors that positively and negatively affect health
researching and describing services provided by environmental agencies (e.g., Soil Conservation, Environmental Protection Agency, KY Department of Natural Resources)
investigating conservation issues related to consumption and waste management practices
use a variety of sources to find examples of jobs carried out by people at school and in the community that support job success
examine individual, family, and community roles and responsibilities by:
investigating a variety of resources and explain ways in which consumers are addressing the effects of renewable resources on the environment
describing jobs carried out by people at school and in the community that support success in school

Big Idea: Financial Literacy

Financial literacy provides knowledge so that students are responsible for their personal economic wellbeing. As consumers, individuals need economic knowledge as a base for making financial decisions impacting short and long term goals throughout one's lifetime. Financial literacy will empower students by providing them with the skills and awareness needed to establish a foundation for a future of financial responsibility and economic independence.

Academic Expectations

- 2.30** Students evaluate consumer products and services and make effective consumer decisions.
2.33 Students demonstrate the skills to evaluate and use services and resources available in their community.
5.4 Students use a decision-making process to make informed decisions among options.

Grade 6 Enduring Knowledge – Understandings

Students will understand that

management of financial resources is needed to meet goals of individuals and families.
savings plans and budgets are a basic component in making financial decisions.
various services are provided by financial institutions (e.g., banks, credit unions).
career choice and lifestyle impact an individual's financial future.

Grade 6 Skills and Concepts

Students will

evaluate financial management resources and how they are needed to meet goals of individuals and families by:
prioritizing financial goals that might affect individuals, families and community
explaining various types of expenses (e.g., food, clothing, entertainment) and savings (e.g., piggy bank, bank account, savings bonds)
investigate savings plans and budgets in making financial decisions by:
developing a savings plan that would achieve a specific goal
describing basic components of a budget (e.g., income, fixed and flexible expenses, and savings)
explaining when and why borrowing is used for the purchase of goods and services
describe how basic services (e.g., deposits, checking account, savings account) are provided by financial institutions (e.g., banks, credit unions)
explain how financial goals affect future lifestyle expectations and career choices

Big Idea: Career Awareness, Exploration, Planning

Career awareness, exploration and planning gives students the opportunity to discover the various career areas that exist and introduce them to the realities involved with the workplace. Many factors need to be considered when selecting a career path and preparing for employment. Career awareness, exploration and planning will enable students to recognize the value of education and learn how to plan for careers. The relationship between academics and jobs/careers will enable students to make vital connections that will give meaning to their learning.

Academic Expectations

- 2.36** Students use strategies for choosing and preparing for a career.
- 2.37** Students demonstrate skills and work habits that lead to success in future schooling and work.
- 2.38** Students demonstrate skills such as interviewing, writing resumes, and completing applications that are needed to be accepted into college or other postsecondary training or to get a job.
- 5.4** Students use a decision-making process to make informed decision among options.

Grade 6 Enduring Knowledge – Understandings

Students will understand that

an individual's work/career encompasses more factors than providing for basic needs.
jobs/careers reflect both individual and societal needs and vary within communities and regions.
career choices are available in planning for job/careers in a variety of career clusters.
the connection between work and academic achievement can influence one's future job/career.
an Individual Learning Plan (ILP) is an academic and career planning tool.
self-knowledge is an important part of the career planning process.

Grade 6 Skills and Concepts

Students will

evaluate why people need to work (e.g., earn money, contribute to community, enhance self-esteem) to meet basic needs (e.g., food, clothing, shelter), provide self-satisfaction, and enjoyment

investigate how jobs/careers reflect both individual and societal needs and vary within communities and regions by:

- comparing different job opportunities in the home, school, and community (e.g., home business, flexible schedule)
- recognizing that the roles of individuals at home, in the workplace, and in the community are constantly changing
- describe a range of academic skills acquired in school (e.g., verbal and nonverbal communication, computer/technical, mathematical) and explain how these skills impact job success and future career opportunities by:
 - researching career choices through the use of technology
 - identifying jobs in career clusters (e.g., Business and Marketing, Communications, Human Services, Social Services, Information Technology, Education, Social Sciences) that vary within and among regions
 - identifying resources (e.g., Internet, newspapers, magazines, counselors) and experiences (e.g., shadowing, mentoring) that can be used for locating job and career information
- develop an educational plan that can impact their future career opportunities by:
 - creating an Individual Learning Plan (ILP) as a tool to explore self-knowledge and academic aptitude and understand that career paths should relate to interests, aptitude, and abilities
 - identifying available postsecondary options (e.g., community and technical colleges, 4-year colleges, military service) used when developing career goals that are included in the Individual Learning Plan (ILP)
- recognize how self-knowledge (e.g., interests, abilities) is helpful when selecting and preparing for a career path and that unique interests may lead to career choices

Big Idea: Employability Skills

Employability skills will focus on student's competencies with their work habits and academic/technical skills that will impact an individual's success in school and workplace. School-to-work transition skills will help students develop interpersonal skills and positive work habits.

Academic Expectations

- 2.36** Students use strategies for choosing and preparing for a career.
2.37 Students demonstrate skills and work habits that lead to success in future schooling and work.
2.38 Students demonstrate skills such as interviewing, writing résumé and completing applications that are needed to be accepted into college or other postsecondary training or to get a job.
3.8 Students demonstrate the ability to make decisions based on ethical values.

Grade 6 Enduring Knowledge – Understandings

Students will understand that

interpersonal skills impact individual's career choice and success in the workplace.
attitudes and work habits contribute to success at home, school and work.
employability skills are important to achieve success in the workplace.
academic and technical skills contribute to obtaining and succeeding in employment.

Grade 6 Skills and Concepts

Students will

evaluate how interpersonal skills impact individual's career choice and success in the workplace by:
explaining ways to cooperate at home, school and work
identifying available resources to locate job openings in the community
identifying effective group interaction strategies (e.g., communicating effectively, conflict resolution, compromise) to develop team skills
demonstrating how working cooperatively with people of diverse backgrounds and abilities is important to achieve success in the workplace
explaining the importance of working cooperatively with others by contributing ideas, suggestions and efforts to complete a task

- explain how attitudes and work habits contribute to success at home, school and work by:
describing leadership skills needed in the school, community and the workplace
explaining how attitudes and work habits transfer from the home and school to the workplace
identifying consequences for actions when disobeying rules and routines when employed
explaining the role of authority in school and the workplace
identifying the importance of developing good work habits (e.g., attendance, time management, problem-solving)
- describe how employability skills are important to achieve success in the workplace by:
explaining the components and complete a job application
examining potential job/careers in the community
explaining how success in an academic course of study could contribute to the ability to achieve and succeed in employment (e.g., Science/Medicine, Language Arts/Librarian)
- explain how academic and technical skills contribute to obtaining and succeeding in employment by:
explaining how effective communication skills (e.g., reading, writing, speaking, and listening) impacts work-related situations and give examples for success at home, school and work
explaining how success in a technical course of study could contribute to the achievement in employment (e.g., Computer and Technology Concepts/Web Design, Life Skills/Child Care)

Big Idea: Communication/Technology

Special communication and technology skills are needed for success in schooling and in the workplace. Students will be able to express information and ideas using a variety of technologies in various ways.

Academic Expectations

- 1.16** Students use computers and other kinds of technology to collect, organize, and communicate information and ideas.
- 2.37** Students demonstrate skills and work habits that lead to success in future schooling and work.
- 2.38** Students demonstrate skills such as interviewing, writing resumes, and completing applications that are needed to be accepted into college or other postsecondary training or to get a job.

Grade 6 Enduring Knowledge – Understandings

Students will understand that

scientific and technological changes can impact a variety of careers.
technology skills can enhance learning and be used in developing a career plan.
communication skills are essential in seeking and maintaining jobs/careers.

Grade 6 Skills and Concepts

Students will

explain how scientific and technological changes impact specific careers (e.g., Nursing, Meteorologist, Radio and Television Broadcaster, Journalist)
evaluate how technology tools (e.g., computer programs, Internet, email, cell phones) are used in homes, schools and jobs by:
explaining how technology provides access to information and resources at home, school and the workplace
developing components of an on-line Individual Learning Plan (ILP) to provide a focus for academic and career planning
demonstrate how communication skills are essential in seeking and maintaining jobs/careers by:
describing the role of technology within a community in maintaining safe and healthy living environment
demonstrating how nonverbal communication skills (e.g., body language, facial expression, posture, dress) can impact relationships at home, school and the workplace
explaining how written communication skills are used at school and in the workplace

Barren County Schools

Arts & Humanities

New standards for Dance, Theater, Media Arts, Music and Visual Arts can be downloaded here:

<http://education.ky.gov/curriculum/standards/kyacadstand/Pages/contentareasstandards.aspx>