| **Test Content Categories** | **How well do I know the content?  (scale 1–5)** | **What resources do I have/need for this content?** | **Where can I find the resources I need?** | **Dates I will study this content** | **Date completed** |
| --- | --- | --- | --- | --- | --- |
| **I. Reading and Language Arts (35%)** |  |  |  |  |  |
| **A. Reading: Foundational Skills** |  |  |  |  |  |
| 1. Understands the role of phonological awareness in literacy development |  |  |  |  |  |
| a. Explains the importance of phonological awareness as a foundational skill for literacy development |  |  |  |  |  |
| b. Identifies and provides examples of phonemes, syllables, onsets, and rimes |  |  |  |  |  |
| c. Identifies and provides examples of blending, segmenting, substituting, and deleting phonemes, syllables, onsets, rimes |  |  |  |  |  |
| 2. Understands the role of phonics and word analysis in literacy development |  |  |  |  |  |
| a. Explains the importance of phonics and word analysis in literacy development |  |  |  |  |  |
| b. Distinguishes among common letter-sound correspondences and spelling conventions |  |  |  |  |  |
| c. Distinguishes high-frequency sight words from decodable words appropriate for particular grades |  |  |  |  |  |
| d. Identifies roots and affixes to decode unfamiliar words |  |  |  |  |  |
| e. Recognizes various stages of language acquisition (e.g., W​I​D​A taxonomy) |  |  |  |  |  |
| f. Delineates common phonics and word-recognition approaches for E​L​Ls (pedagogy) |  |  |  |  |  |
| g. Differentiates syllabication patterns (e.g., open, closed, C​V​e) |  |  |  |  |  |
| 3. Understands the role of fluency (e.g., rate, accuracy) in literacy development |  |  |  |  |  |
| a. Defines fluency and related terms (e.g., accuracy, rate, prosody) |  |  |  |  |  |
| **B. Reading: Literature and Informational Text** |  |  |  |  |  |
| 1. Understands how to use key ideas and details to comprehend literature and informational text |  |  |  |  |  |
| a. Identifies the key details, moral, and/or theme of a literary text, citing specific textual evidence |  |  |  |  |  |
| b. Identifies the key details and/or central idea of an informational text, citing specific textual evidence |  |  |  |  |  |
| c. Makes inferences from a text and supports them with appropriate evidence |  |  |  |  |  |
| d. Summarizes information from a text |  |  |  |  |  |
| e. Analyzes the characters, setting, and plot of a literary text |  |  |  |  |  |
| f. Analyzes the relationships among individuals, events, ideas, and concepts in an informational text |  |  |  |  |  |
| 2. Understands how features and structures of text across genres affect comprehension |  |  |  |  |  |
| a. Identifies structural elements of literature across genres (e.g., casts of characters and stage directions in drama, rhyme and meter in poetry) |  |  |  |  |  |
| b. Uses text features (e.g., headings, sidebars, hyperlinks) to locate information in a print or digital informational text |  |  |  |  |  |
| c. Identifies organizational structures of informational text (e.g., cause/effect, problem/solution) |  |  |  |  |  |
| d. Identifies how structural elements contribute to the development of a literary text as a whole |  |  |  |  |  |
| 3. Understands the concept of point of view using evidence from the text |  |  |  |  |  |
| a. Identifies author’s point of view in various genres and supports conclusions with evidence from the text |  |  |  |  |  |
| b. Compares multiple accounts of the same event or topic to identify similarities or differences in point of view |  |  |  |  |  |
| c. Identifies how point of view impacts the overall structure of a literary or informational text |  |  |  |  |  |
| 4. Understands how to integrate and compare written, visual, and oral information from texts and multimedia sources |  |  |  |  |  |
| a. Explains how visual and oral elements enhance the meaning and effect of a literary text (e.g., picture book, graphic novel, multimedia presentation of a folktale) |  |  |  |  |  |
| b. Compares the written version of a literary text with an oral, staged, or filmed version |  |  |  |  |  |
| c. Compares two or more literary texts that address the same theme |  |  |  |  |  |
| d. Compares two or more informational texts that address the same topic |  |  |  |  |  |
| e. Interprets visual and multimedia elements in literary and informational texts |  |  |  |  |  |
| f. Evaluates key claims in a text and supports them with reasons and evidence from the text |  |  |  |  |  |
| 5. Knows the role of text complexity in reading development |  |  |  |  |  |
| a. Explains the three factors (i.e., quantitative, qualitative, and reader and task) that measure text complexity |  |  |  |  |  |
| b. Identifies features of text-leveling systems |  |  |  |  |  |
| **C. Writing** |  |  |  |  |  |
| 1. Understands the characteristics of common types of writing |  |  |  |  |  |
| a. Distinguishes among common types of writing (e.g., opinion/argument, informative/explanatory, narrative) |  |  |  |  |  |
| b. Identifies the purpose, key components, and subgenres (e.g., speeches, advertisements, narrative poems) of each common type of writing |  |  |  |  |  |
| c. Evaluates the effectiveness of writing samples of each type |  |  |  |  |  |
| 2. Understands the characteristics of effective writing |  |  |  |  |  |
| a. Evaluates the appropriateness of a particular piece of writing for a specific task, purpose, and audience |  |  |  |  |  |
| b. Evaluates the development, organization, or style of a piece of writing |  |  |  |  |  |
| c. Identifies appropriate revisions to strengthen a piece of writing |  |  |  |  |  |
| d. Writes clearly and coherently |  |  |  |  |  |
| e. Identifies the interrelationships among planning, revising, and editing in the process of writing |  |  |  |  |  |
| 3. Knows the developmental stages of writing (e.g., picture, scribble) |  |  |  |  |  |
| a. Identifies the grade-appropriate continuum of student writing |  |  |  |  |  |
| 4. Knows the importance of digital tools for producing and publishing writing and for interacting with others |  |  |  |  |  |
| a. Identifies the characteristics and purposes of a variety of digital tools for producing and publishing writing |  |  |  |  |  |
| b. Identifies the purposes of a variety of digital tools for interacting with others |  |  |  |  |  |
| 5. Knows the research process |  |  |  |  |  |
| a. Identifies the steps in the research process |  |  |  |  |  |
| b. Distinguishes between primary and secondary sources and their uses |  |  |  |  |  |
| c. Distinguishes between reliable and unreliable sources |  |  |  |  |  |
| d. Distinguishes between paraphrasing and plagiarizing |  |  |  |  |  |
| e. Knows how to locate credible print and digital sources, locate information within the sources, and cite the sources |  |  |  |  |  |
| **D. Language** |  |  |  |  |  |
| 1. Knows the conventions of standard English grammar, usage, mechanics, and spelling when writing, speaking, reading, and listening |  |  |  |  |  |
| a. Explains the function of different parts of speech |  |  |  |  |  |
| b. Corrects errors in usage, mechanics and spelling |  |  |  |  |  |
| c. Identifies examples of different sentence types (e.g., simple, compound, compound-complex) |  |  |  |  |  |
| d. Identify how varieties of English (e.g., dialects, registers) used in stories, dramas, or poems support the overall meaning |  |  |  |  |  |
| 2. Understands how to determine the meaning of words and phrases |  |  |  |  |  |
| a. Determines the literal meaning of unknown words and phrases from context, syntax, and/or knowledge of roots and affixes |  |  |  |  |  |
| b. Identifies types of figurative language |  |  |  |  |  |
| c. Interprets figurative language |  |  |  |  |  |
| d. Analyzes the relationship between word choice and tone in a text |  |  |  |  |  |
| 3. Understands characteristics of conversational, academic, and domain-specific language |  |  |  |  |  |
| a. Differentiates among the three tiers of vocabulary |  |  |  |  |  |
| b. Identifies relevant features of language such as word choice, order, and punctuation |  |  |  |  |  |
| **E. Speaking and Listening** |  |  |  |  |  |
| 1. Knows the characteristics of effective collaboration to promote comprehension |  |  |  |  |  |
| a. Identifies techniques to communicate for a variety of purposes with diverse partners |  |  |  |  |  |
| b. Identifies the characteristics of active listening |  |  |  |  |  |
| 2. Knows the characteristics of engaging oral presentations |  |  |  |  |  |
| a. Identifies elements of engaging oral presentations (e.g., volume, articulation, awareness of audience) |  |  |  |  |  |
| **II. Mathematics (29%)** |  |  |  |  |  |
| **A. Numbers and Operations** |  |  |  |  |  |
| 1. Understands the place value system |  |  |  |  |  |
| a. Writes numbers using base-10 numerals, number names, and expanded form |  |  |  |  |  |
| b. Composes and decomposes multi-digit numbers |  |  |  |  |  |
| c. Given a digit, identifies the place the digit is in and its value in that place |  |  |  |  |  |
| d. Recognizes that a digit in one place represents ten times what it represents in the place to its right and one-tenth what it represents in the place to its left, and extend this recognition to several place to the right or left |  |  |  |  |  |
| e. Uses whole-number exponents to denote powers of 10 |  |  |  |  |  |
| f. Rounds multi-digit numbers to any place value |  |  |  |  |  |
| 2. Understands operations and properties of rational numbers |  |  |  |  |  |
| a. Solves multistep mathematical and real-world problems using addition, subtraction, multiplication, and division of rational numbers and shows knowledge of how to classify problem situations, inverse operations, remainders, concepts of zero, absolute value, and opposites |  |  |  |  |  |
| b. Understands various strategies and algorithms used to perform operations on rational numbers |  |  |  |  |  |
| c. Recognizes concepts of rational numbers and their operations, including those related to unit fractions, composition and decomposition of fractions, comparing fractions |  |  |  |  |  |
| d. Solves problems using the order of operations, including problems involving whole-number exponents |  |  |  |  |  |
| e. Identifies properties of operations (e.g., commutative, associative, distributive) and uses them to solve problems |  |  |  |  |  |
| f. Represents rational numbers and their operations in different ways, using drawings, models, number lines, arrays |  |  |  |  |  |
| g. Compares, classifies, and orders rational numbers |  |  |  |  |  |
| h. Converts between fractions, decimals, and percents |  |  |  |  |  |
| 3. Understands proportional relationships and percents |  |  |  |  |  |
| a. Applies the concepts of ratios and unit rates to describe relationships between two quantities |  |  |  |  |  |
| b. Understands percent as a rate per 100 |  |  |  |  |  |
| c. Solves unit-rate problems |  |  |  |  |  |
| d. Uses proportional relationships to solve ratio and percent problems |  |  |  |  |  |
| 4. Knows how to use basic concepts of number theory |  |  |  |  |  |
| a. Identifies and uses prime and composite numbers |  |  |  |  |  |
| b. Finds factors and multiples of numbers |  |  |  |  |  |
| 5. Knows a variety of strategies to determine reasonableness of results |  |  |  |  |  |
| a. Recognizes the reasonableness of results within the context of a given problem |  |  |  |  |  |
| b. Uses mental math, estimation, and rounding strategies to solve problems and determine reasonableness of results |  |  |  |  |  |
| **B. Algebraic Thinking** |  |  |  |  |  |
| 1. Knows how to evaluate and manipulate algebraic expressions, equations, and formulas |  |  |  |  |  |
| a. Differentiates between algebraic expressions and equations |  |  |  |  |  |
| b. Adds and subtracts linear algebraic expressions |  |  |  |  |  |
| c. Uses the distributive property to generate equivalent linear algebraic expressions |  |  |  |  |  |
| d. Evaluates simple algebraic expressions (i.e., one variable, binomial) for given values of variables |  |  |  |  |  |
| e. Uses mathematical terms to identify parts of expressions and describe expressions |  |  |  |  |  |
| f. Translates between verbal statements and algebraic expressions or equations (e.g., the phrase “the number of cookies Joe has is equal to twice the number of cookies Sue has” can be represented by the equation  ) |  |  |  |  |  |
| g. Uses formulas to determine unknown quantities |  |  |  |  |  |
| h. Differentiates between dependent and independent variables in formulas |  |  |  |  |  |
| 2. Understands the meanings of the solutions to linear equations and inequalities |  |  |  |  |  |
| a. Solves multistep one-variable linear equations and inequalities |  |  |  |  |  |
| b. Interprets solutions of multistep one-variable linear equations and inequalities (e.g., graphs the solution on a number line, states constraints on a situation) |  |  |  |  |  |
| c. Uses linear relationships represented by equations, tables, and graphs to solve problems |  |  |  |  |  |
| 3. Knows how to recognize and represent patterns (e.g., number, shape) |  |  |  |  |  |
| a. Identifies, extends, describes, or generates number and shape patterns |  |  |  |  |  |
| b. Makes conjectures, predictions, or generalizations based on patterns |  |  |  |  |  |
| c. Identifies relationships between the corresponding terms of two numerical patterns (e.g., find a rule for a function table) |  |  |  |  |  |
| **C. Geometry and Measurement** |  |  |  |  |  |
| 1. Understands how to classify one-, two-, and three-dimensional figures |  |  |  |  |  |
| a. Uses definitions to identify lines, rays, line segments, parallel lines, and perpendicular lines |  |  |  |  |  |
| b. Classifies angles based on their measure |  |  |  |  |  |
| c. Composes and decomposes two- and three-dimensional shapes |  |  |  |  |  |
| d. Uses attributes to classify or draw polygons and solids |  |  |  |  |  |
| 2. Knows how to solve problems involving perimeter, area, surface area, and volume |  |  |  |  |  |
| a. Represents three-dimensional figures with nets |  |  |  |  |  |
| b. Use nets that are made of rectangles and triangles to determine the surface area of three-dimensional figures |  |  |  |  |  |
| c. Finds the area and perimeter of polygons, including those with fractional side lengths |  |  |  |  |  |
| d. Finds the volume and surface area of right rectangular prisms, including those with fractional edge lengths |  |  |  |  |  |
| e. Determines how changes to dimensions change area and volume |  |  |  |  |  |
| 3. Knows the components of the coordinate plane and how to graph ordered pairs on the plane |  |  |  |  |  |
| a. Identifies the x-axis, the y-axis, the origin, and the four quadrants in the coordinate plane |  |  |  |  |  |
| b. Solves problems by plotting points and drawing polygons in the coordinate plane |  |  |  |  |  |
| 4. Knows how to solve problems involving measurement |  |  |  |  |  |
| a. Solves problems involving elapsed time, money, length, volume, and mass |  |  |  |  |  |
| b. Measures and compares lengths of objects using standard tools |  |  |  |  |  |
| c. Knows relative sizes of United States customary units and metric units |  |  |  |  |  |
| d. Converts units within both the United States customary system and the metric system |  |  |  |  |  |
| **D. Data, Statistics, and Probability** |  |  |  |  |  |
| 1. Is familiar with basic statistical concepts |  |  |  |  |  |
| a. Identifies statistical questions |  |  |  |  |  |
| b. Solves problems involving measures of center (mean, median, mode) and range |  |  |  |  |  |
| c. Recognizes which measure of center best describes a set of data |  |  |  |  |  |
| d. Determines how changes in data affect measures of center or range |  |  |  |  |  |
| e. Describes a set of data (e.g., overall patterns, outliers) |  |  |  |  |  |
| 2. Knows how to represent and interpret data presented in various forms |  |  |  |  |  |
| a. Interprets various displays of data (e.g., box plots, histograms, scatterplots) |  |  |  |  |  |
| b. Identifies, constructs, and completes graphs that correctly represent given data (e.g., circle graphs, bar graphs, line graphs, histograms, scatterplots, double bar graphs, double line graphs, box plots, and line plots/dot plots) |  |  |  |  |  |
| c. Chooses appropriate graphs to display data |  |  |  |  |  |
| 3. Is familiar with how to interpret the probability of events |  |  |  |  |  |
| a. Interprets probabilities relative to likelihood of occurrence |  |  |  |  |  |
| **III. Social Studies (18%)** |  |  |  |  |  |
| **A. Geography, Anthropology, and Sociology** |  |  |  |  |  |
| 1. Knows world and regional geography |  |  |  |  |  |
| a. Is familiar with spatial terms and can identify spatial patterns of people, places, and environments |  |  |  |  |  |
| b. Identifies the characteristics of places and regions |  |  |  |  |  |
| c. Locates major physical features of geography (e.g., mountain ranges, bodies of water) |  |  |  |  |  |
| d. Locates major political features of geography (e.g., continents, countries, states, cities) |  |  |  |  |  |
| e. Demonstrates basic geographic literacy (e.g., uses and interpretations of different types of maps, understanding of the concepts of absolute and relative location, identification of cardinal and intermediate directions) |  |  |  |  |  |
| 2. Understands the interaction of physical and human systems |  |  |  |  |  |
| a. Demonstrates knowledge of how humans change the environment |  |  |  |  |  |
| b. Demonstrates knowledge of how the environment affects human activities |  |  |  |  |  |
| c. Understands the importance of natural and human resources |  |  |  |  |  |
| 3. Knows the uses of geography |  |  |  |  |  |
| a. Applies geography to interpret the past and the present and to plan for the future |  |  |  |  |  |
| 4. Knows how people of different backgrounds interact with their environment, self, family, neighborhood, and organizations |  |  |  |  |  |
| a. Demonstrates knowledge of society’s groups, institutions, and organizations |  |  |  |  |  |
| b. Demonstrates knowledge of how human behavior is influenced by society and by society’s groups, institutions, and organizations |  |  |  |  |  |
| **B. World History** |  |  |  |  |  |
| 1. Knows the major contributions of classical civilizations such as Egypt, Greece, and Rome |  |  |  |  |  |
| a. Demonstrates knowledge of how modern civilizations reflect, mirror, and learn from the contributions of ancient civilizations |  |  |  |  |  |
| 2. Understands twentieth-century developments and transformations in world history |  |  |  |  |  |
| a. Demonstrates knowledge of the causes and effects of the First and Second World Wars and the Cold War |  |  |  |  |  |
| b. Demonstrates knowledge of technological developments (e.g., transportation, communication, tools) |  |  |  |  |  |
| c. Demonstrates knowledge of the causes and effects of globalization |  |  |  |  |  |
| 3. Understands the role of cross-cultural comparisons in world history instruction |  |  |  |  |  |
| a. Demonstrates knowledge of various psychological, sociological, and cultural factors needed to assess the similarities and/or diversities in two or more different cultures or societies |  |  |  |  |  |
| **C. United States History** |  |  |  |  |  |
| 1. Knows about the European exploration and colonization of North America and growth and expansion of the United States |  |  |  |  |  |
| a. Demonstrates knowledge of Native American peoples and cultures |  |  |  |  |  |
| b. Demonstrates knowledge of the reasons for the colonization of North America and the development of the thirteen colonies |  |  |  |  |  |
| c. Is familiar with the interactions between Native American groups, colonists, and European powers |  |  |  |  |  |
| 2. Knows about the American Revolution and the founding of the United States |  |  |  |  |  |
| a. Understands the causes and effects of the American Revolution |  |  |  |  |  |
| b. Identifies key individuals and events during the American Revolution |  |  |  |  |  |
| c. Demonstrates knowledge of the challenges faced by the early republic (e.g., creation of a democratic government) |  |  |  |  |  |
| 3. Knows about the major events and developments in United States history from founding to present |  |  |  |  |  |
| a. Demonstrates knowledge of the causes and effects of the territorial expansion of the United States (e.g., concept of Manifest Destiny; Louisiana Purchase; impact on Native Americans; role of technological, political, and economic developments) |  |  |  |  |  |
| b. Understands the causes and effects of the Civil War (e.g., growth of sectionalism, the abolition movement, the Underground Railroad, the reasons for the succession of the Confederate States, the role of Abraham Lincoln, the purposes and challenges of Reconstruction) |  |  |  |  |  |
| c. Demonstrates knowledge of the causes and effects of industrialization, urbanization, and immigration |  |  |  |  |  |
| d. Is familiar with major social and cultural developments throughout United States history |  |  |  |  |  |
| 4. Knows about twentieth-century developments and transformations in the United States |  |  |  |  |  |
| a. Demonstrates knowledge of the causes and effects of the Great Depression (e.g., New Deal legislation) |  |  |  |  |  |
| b. Demonstrates knowledge of the causes and effects of the First and Second World Wars and the Cold War |  |  |  |  |  |
| c. Demonstrates knowledge of major economic developments (e.g., assembly line, mass production,) and the influence of technological developments |  |  |  |  |  |
| 5. Understands connections between the causes and effects of events |  |  |  |  |  |
| a. Demonstrates the ability to draw connections between the causes and effects of significant events throughout United States history |  |  |  |  |  |
| **D. Government, Citizenship, and Democracy** |  |  |  |  |  |
| 1. Understands the nature, purpose, and forms of government |  |  |  |  |  |
| a. Is familiar with the founding principles of the United States government (e.g., republicanism, separation of powers, checks and balances, popular sovereignty) |  |  |  |  |  |
| b. Demonstrates knowledge of federalism (e.g., division of power between the national and state governments) |  |  |  |  |  |
| c. Demonstrates knowledge of the powers of the three branches of the federal government and the interactions among them |  |  |  |  |  |
| d. Is familiar with basic characteristics of different political systems |  |  |  |  |  |
| 2. Knows key documents and speeches in the history of the United States |  |  |  |  |  |
| a. Is familiar with the purpose and contents of the Declaration of Independence |  |  |  |  |  |
| b. Is familiar with the Articles of Confederation |  |  |  |  |  |
| c. Demonstrates knowledge of the structure of government outlined in the United States Constitution |  |  |  |  |  |
| d. Demonstrates knowledge of the rights and protections guaranteed to United States citizens by the Constitution |  |  |  |  |  |
| e. Is familiar with key documents and speeches (e.g., Gettysburg Address) |  |  |  |  |  |
| 3. Knows the rights and responsibilities of citizenship in a democracy |  |  |  |  |  |
| a. Demonstrates knowledge of civic participation (e.g., community service, membership in civic organizations) |  |  |  |  |  |
| b. Demonstrates knowledge of the rights and responsibilities of citizens in the United States (e.g. voting, paying taxes, freedom of speech) |  |  |  |  |  |
| **E. Economics** |  |  |  |  |  |
| 1. Knows key terms and basic concepts of economics |  |  |  |  |  |
| a. Demonstrates knowledge of supply and demand |  |  |  |  |  |
| b. Is familiar with concepts of scarcity, choice, and opportunity cost |  |  |  |  |  |
| c. Demonstrates knowledge of the role of money and resources in economic decision making |  |  |  |  |  |
| 2. Understands how economics affects population, resources, and technology |  |  |  |  |  |
| a. Demonstrates an understanding of how people use resources to generate wealth and enhance their lives |  |  |  |  |  |
| b. Demonstrates an understanding of how economics drives and is driven by technological innovations |  |  |  |  |  |
| 3. Understands the government’s role in economics and the impact of economics on government |  |  |  |  |  |
| a. Demonstrates knowledge of the federal government’s role in regulating the economy |  |  |  |  |  |
| b. Demonstrates knowledge of taxing and spending |  |  |  |  |  |
| **F. Social Studies as Inquiry and Social Studies Processes** |  |  |  |  |  |
| 1. Understands social studies as inquiry |  |  |  |  |  |
| a. Demonstrates knowledge of questioning, gathering data, and drawing reasonable conclusions |  |  |  |  |  |
| 2. Understands how to use resource and research material in social studies |  |  |  |  |  |
| a. Understands how to evaluate the appropriate uses of a variety of resources |  |  |  |  |  |
| b. Identifies primary and secondary sources and demonstrates knowledge of the uses of each |  |  |  |  |  |
| c. Demonstrates knowledge of fact and opinion and knows the uses of each in social studies |  |  |  |  |  |
| 3. Understands process skills in social studies |  |  |  |  |  |
| a. Understands how to interpret different types of information |  |  |  |  |  |
| b. Evaluates relationships among different variables |  |  |  |  |  |
| c. Demonstrates ability to draw conclusions using tools of the field |  |  |  |  |  |
| **IV. Science (18%)** |  |  |  |  |  |
| **A. Earth and Space Science** |  |  |  |  |  |
| 1. Understands basic physical and historical geology |  |  |  |  |  |
| a. Identify Earth’s basic structure (e.g., mantle, core, geographical features such as mountains, magnetic field) |  |  |  |  |  |
| b. Identify and describe types and characteristics of rocks and minerals |  |  |  |  |  |
| c. Recognize processes involved in erosion, weathering, and deposition of Earth’s surface materials |  |  |  |  |  |
| d. Recognize Earth’s internal processes including impact of plate tectonic theory (e.g., volcanoes, earthquakes) |  |  |  |  |  |
| e. Identify key aspects of the water cycle (e.g., evaporation, condensation, precipitation, runoff) |  |  |  |  |  |
| f. Recognize important events in Earth’s geologic history and the importance of rock record and fossils |  |  |  |  |  |
| 2. Is familiar with the structure and processes of Earth’s hydrosphere |  |  |  |  |  |
| a. Identify the geographic location of Earth’s oceans and seas and the processes involved with tides and waves |  |  |  |  |  |
| b. Identify characteristics of lakes, streams rivers, polar ice, icebergs, glaciers, and groundwater |  |  |  |  |  |
| c. Identify the basic characteristics of Earth’s atmosphere |  |  |  |  |  |
| d. Recognize the basic concepts of weather (e.g., clouds, precipitation, hurricanes) |  |  |  |  |  |
| e. Identify factors that affect climate and seasons (e.g., climate zones, proximity to mountains and oceans) |  |  |  |  |  |
| 3. Is familiar with astronomy |  |  |  |  |  |
| a. Identify the major features of the solar system, including the Sun, the planets, moons, asteroids, and comets |  |  |  |  |  |
| b. Recognize the interactions of the Earth-Moon-Sun system (e.g., phases of the Moon, eclipses, seasons, tides |  |  |  |  |  |
| c. Recognize the major features of the universe (e.g., galaxies, stars, black holes) |  |  |  |  |  |
| **B. Life Sciences** |  |  |  |  |  |
| 1. Understands the basic structure and function of cells and levels of organization in living things |  |  |  |  |  |
| a. Identify the structure and function of cell organelles (e.g., nucleus, cell membrane) |  |  |  |  |  |
| b. Recognize basic cell processes such as cell division and photosynthesis |  |  |  |  |  |
| c. Identify the levels of organization (cells, tissues, organs, organ systems) |  |  |  |  |  |
| 2. Understands basic genetics and evolution |  |  |  |  |  |
| a. Apply basic genetics (e.g., relationship between genes and traits) |  |  |  |  |  |
| b. Recognize the basic structure and function of DNA and relationship to heredity |  |  |  |  |  |
| c. Recognize common human genetic disorders |  |  |  |  |  |
| d. Identify processes by which species change over time, including natural selection, mutation, evolution |  |  |  |  |  |
| 3. Knows the hierarchical classification scheme and the characteristics of the major groups of organisms |  |  |  |  |  |
| a. Identify elements of classification schemes (e.g., kingdom, genus, species) |  |  |  |  |  |
| b. Identify major characteristics of common types of organisms (e.g. amphibians, reptiles, mammals, plants) |  |  |  |  |  |
| 4. Knows the major structures and functions of plant organs and systems |  |  |  |  |  |
| a. Identify the basic structure and function of leaves, roots, and stems |  |  |  |  |  |
| b. Recognize key aspects of asexual and sexual reproduction, development, and growth |  |  |  |  |  |
| c. Recognize the uptake and transport of nutrients and water |  |  |  |  |  |
| 5. Knows the basic anatomy and physiology of animals, including human body systems |  |  |  |  |  |
| a. Identify examples of exchange with the environment involving the respiratory, excretory, and digestive systems |  |  |  |  |  |
| b. Recognize key aspects of internal transport and exchange in terms of the circulatory system |  |  |  |  |  |
| c. Recognize key aspects of support and movement in terms of the skeletal and muscular systems |  |  |  |  |  |
| d. Identify key aspects of reproduction and development |  |  |  |  |  |
| e. Recognize the function of immune systems |  |  |  |  |  |
| f. Identify the functions of immune systems, nervous systems, and endocrine systems |  |  |  |  |  |
| g. Recognize the importance of homeostasis |  |  |  |  |  |
| 6. Knows key aspects of ecology |  |  |  |  |  |
| a. Recognize key relationships between and among species such as territoriality, predator-prey, and parasitism |  |  |  |  |  |
| b. Recognize key aspects of ecosystems (e.g., biomes, energy levels, food webs, effect of disturbances) |  |  |  |  |  |
| **C. Physical Sciences** |  |  |  |  |  |
| 1. Knows the basic structure and properties of matter |  |  |  |  |  |
| a. Identify basic properties of solids, liquids and gases (e.g., structure, density, conductivity, solubility) |  |  |  |  |  |
| b. Identify and distinguish between elements, atoms, compounds, molecules, and mixtures |  |  |  |  |  |
| c. Describe the atomic model, including electrons, protons, neutrons, atomic number and atomic mass |  |  |  |  |  |
| d. Is familiar with the periodic table of the elements, its symbols and the information it provides |  |  |  |  |  |
| 2. Knows the basic relationships between energy and matter |  |  |  |  |  |
| a. Recognize that energy and matter is conserved in various situations |  |  |  |  |  |
| b. Recognize how various forms of kinetic and potential energy can be transformed from one form to another |  |  |  |  |  |
| c. Identify the differences between chemical and physical properties/changes |  |  |  |  |  |
| d. Describe methods of heat transfer (convection, radiation, conduction) |  |  |  |  |  |
| e. Describe how the states of matter undergo phase changes and the energy changes involved |  |  |  |  |  |
| 3. Understands basic chemical reactions |  |  |  |  |  |
| a. Identify the difference between covalent and ionic bonding |  |  |  |  |  |
| b. Interpret simple chemical formulas |  |  |  |  |  |
| c. Recognize that chemical reactions involve energy changes |  |  |  |  |  |
| d. Identify chemical and physical properties of acids and bases and the pH scale |  |  |  |  |  |
| e. Recognize common types of chemical reactions such as neutralization, oxidation, and combustion |  |  |  |  |  |
| 4. Understands basic concepts in mechanics |  |  |  |  |  |
| a. Describe motion in terms of distance, speed, velocity, and acceleration |  |  |  |  |  |
| b. Describe the effect of forces on objects (e.g., collisions, pendulums, friction) |  |  |  |  |  |
| c. Recognize the effect of gravity and distinguish between mass and weight |  |  |  |  |  |
| d. Recognize forces and physical properties involving fluids that determine whether objects will sink or float |  |  |  |  |  |
| 5. Understands basic concepts in electricity, magnetism, waves, and optics |  |  |  |  |  |
| a. Describe basic characteristics of magnets (e.g., magnetic poles, attraction, repulsion) |  |  |  |  |  |
| b. Recognize electrostatic attraction and repulsion |  |  |  |  |  |
| c. Describe electricity in terms of the flow of electrons and identify voltage sources (batteries and generators) |  |  |  |  |  |
| d. Describe the basic phenomena involving light (reflection, rainbows, mirrors, prisms) |  |  |  |  |  |
| e. Describe basic characteristics of sound (pitch, loudness, the Doppler effect) |  |  |  |  |  |
| **D. Impact of Science and Technology on Society** |  |  |  |  |  |
| 1. Knows the impact of science and technology on the environment and society |  |  |  |  |  |
| a. Recognize the impact of air and water pollution, greenhouse gases |  |  |  |  |  |
| b. Recognize the impact of production and  disposal of consumer products |  |  |  |  |  |
| c. Recognize the benefits of conservation and recycling |  |  |  |  |  |
| d. Identify renewable and nonrenewable energy resources |  |  |  |  |  |
| e. Identify the pros and cons of power generation based on various sources (e.g., fossil, nuclear, water, wind, solar, biomass, geothermal) |  |  |  |  |  |
| 2. Is familiar with applications of science and  technology in daily life and public health |  |  |  |  |  |
| a. Identify applications of chemical and physical principles related to common consumer products (e.g., acid-base properties of orange juice, applications of physics in devices such as lenses) |  |  |  |  |  |
| b. Identify common agricultural practices (e.g., genetically modified crops, use of herbicides and insecticides) |  |  |  |  |  |
| c. Recognize the role of nutrition, disease, and medicine (e.g., food preservation, vitamins, vaccines, viruses) |  |  |  |  |  |
| d. Recognize applications of medical technologies (e.g., M​R​Is, X-rays, radiation therapy) |  |  |  |  |  |
| **E. Science as Inquiry and Science Processes** |  |  |  |  |  |
| 1. Understands the basic elements of scientific inquiry and how they are used |  |  |  |  |  |
| a. Identify hypotheses, theories, models, and laws, and their role in scientific inquiry |  |  |  |  |  |
| b. Explain the role of the elements of experimental design, including independent and dependent variables, controls, sources of error, and drawing conclusions |  |  |  |  |  |
| c. Recognize that scientific knowledge is subject to change, consistent with evidence, based on reproducible evidence and includes unifying concepts and processes (e.g., systems, models, constancy and change, equilibrium, form and function) |  |  |  |  |  |
| d. Recognize how key concepts developed over time and identify the contribution of key historical figures (e.g., Newton’s laws, Marie Curie’s work with radioactivity, Mendel’s development of basic genetics) |  |  |  |  |  |
| 2. Understands the common methods and tools used to gather and present reliable data |  |  |  |  |  |
| a. Identify common units of measurement (e.g., meter, gram, liter) |  |  |  |  |  |
| b. Explain the appropriate use of common measurement tools (e.g., thermometers, barometers, balances) |  |  |  |  |  |
| c. Organize and present data (e.g., graphs, tables, charts, maps) |  |  |  |  |  |
| 3. Knows how to interpret and draw conclusions from data presented in tables, graphs, charts, and maps |  |  |  |  |  |
| a. Identify patterns and significant points in data |  |  |  |  |  |
| b. Draw conclusions and make predictions based on presented data |  |  |  |  |  |
| c. Recognize relationships between variables |  |  |  |  |  |
| d. Recognize the effect of error on data and conclusions |  |  |  |  |  |
| 4. Understands procedures for safe and correct use of laboratory materials and equipment |  |  |  |  |  |
| a. Recognize safe and appropriate methods to prepare materials for classroom use (activities and demonstrations) |  |  |  |  |  |
| b. Recognize when and how to use standard equipment in the laboratory (e.g., microscopes, graduated cylinders) |  |  |  |  |  |
| c. Explain the use of standard safety equipment (e.g., eyewash stations, safety showers) |  |  |  |  |  |
| d. Identify appropriate student apparel and behavior (e.g., goggles, clothing, no eating in lab) |  |  |  |  |  |
| e. Recognize emergency procedures for mishaps (e.g., fires, chemical spills, injuries) and evacuation procedures |  |  |  |  |  |