

Middle Grades Integrated Curriculum 5–9

**English
General Science
Mathematics
Social Science**

Section 62

Middle Grades Integrated Curriculum 5–9 English

1 Knowledge of written and oral language

1. Determine a systematic process for the collection, processing, and presentation of information.
2. Identify standard English usage, grammar, and punctuation.
3. Select statements that best develop and support a thesis.
4. Choose an organizational strategy for a specific purpose (e.g., chronological, spatial, causal, sequential).
5. Identify appropriate modes (e.g., expository, narrative, persuasive) to create effective discourse.

2 Knowledge of reading

1. Determine the author's purpose of a written text.
2. Make inferences and draw conclusions based on information conveyed in a written text.
3. Determine the main idea of a written text.
4. Distinguish between fact and opinion.
5. Assess the relevance, importance, and sufficiency of facts, examples, and reasons provided in support of an argument.
6. Identify cause-and-effect relationships in a written text.
7. Compare and contrast elements (e.g., setting, plot, character, theme) in a written text.
8. Determine meanings of words using context clues.

3 Knowledge of literature

1. Identify selections from literature, including folklore and mythology, for a variety of student interests and needs.
2. Interpret fictional and nonfictional texts representative of diverse cultures and historical periods.
3. Identify common literary elements and techniques (e.g., theme, figurative language, mood, tone, foreshadowing, point of view).

4 Knowledge of teaching middle grades English

1. Apply interdisciplinary techniques within middle grades English classrooms.
2. Select appropriate strategies and resources, including technological resources, for language arts (e.g., written and oral language, literature) and reading instruction.

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General Science

5 Knowledge of the nature of science

1. Apply knowledge of science skills (e.g., observing, inferring, communicating, classifying, predicting, metric or SI measuring, graphing) to real-world situations.
2. Apply knowledge of the science processes (e.g., forming hypotheses, manipulating variables, collecting data, analyzing results, reaching conclusions) to real-world situations.
3. Apply knowledge of scientific inquiry in designing and performing investigations.
4. Identify procedures for the appropriate and safe use, care, handling, storage, and disposal of chemicals, equipment, organisms, and other laboratory materials.

6 Knowledge of living things and their environment

1. Distinguish relationships between structure and function (e.g., reproduction, maintenance, growth, regulation) in organelles, cells, and organisms.
2. Apply the principles of genetics, including mitosis and meiosis, Mendelian genetics, molecular biology (e.g., DNA, RNA, replication, protein synthesis), and patterns of inheritance, to genetic problem solving.
3. Identify the major steps of plant and animal physiological processes (e.g., photosynthesis, transpiration, reproduction, respiration, digestion, circulation).
4. Differentiate structures and functions of organs and organ systems of living things.
5. Identify patterns of animal behavior (e.g., territorial, social, learned, instinctive, communicative).
6. Identify current issues and effective methods of conservation of natural resources.
7. Identify interactions between biotic and abiotic factors in the environment (e.g., population density, pollution, succession, adaptation).
8. Identify the major characteristics of world biomes and communities and the interrelationships of the organisms within them.

7 Knowledge of the forces of Earth and space

1. Identify the characteristics of geologic structures (e.g., mountains, canyons, rivers, glaciers) and the mechanisms (e.g., plate tectonics, volcanic activity, erosion) by which they were formed.

2. Identify how fossils are formed, the methods for determining geologic age, and how this information is used to interpret the past.
3. Analyze data to interpret and forecast weather.
4. Analyze the chemical, physical, and geological characteristics of the ocean (e.g., salinity, currents, tides, shorelines).
5. Identify the characteristics of rocks, minerals, and soils and the mechanisms by which they were formed.
6. Identify the ways in which earth, air, and water interact (e.g., runoff, percolation, erosion, hydrologic cycle, wind patterns, storms).
7. Identify components and pathways of the nitrogen, carbon, and oxygen cycles.
8. Identify components of Earth's solar system, their individual characteristics, and how they interact.
9. Identify structures in the universe (e.g., stars, black holes, galaxies, other solar systems, quasars), their characteristics, and scientific theories of their origins.
10. Demonstrate knowledge of space travel and exploration and identify examples of their impact on society.

8 Knowledge of matter and energy

1. Identify the physical and chemical properties of matter (e.g., mass, volume, density, chemical reactivity, temperature, pressure, state).
2. Apply knowledge of the periodic table to identify the characteristics of atoms, the chemical and physical combinations of atoms, and associated representations (e.g., symbols, formulas, equations).
3. Identify the features and characteristics of different ranges of wavelengths across the electromagnetic spectrum.
4. Apply knowledge of energy forms (e.g., potential, kinetic), energy types (e.g., solar; electrical; magnetic; mechanical; chemical; nuclear, including fission and fusion), and energy transfer (e.g., convection, conduction, radiation) to solve problems.
5. Apply knowledge of laws of force, motion, and energy (e.g., Newton's laws, the ideal gas law, simple or compound machines) to solve problems.
6. Apply knowledge of currents, circuits, conductors, insulators, and resistors in real-world situations.
7. Identify properties and behaviors of sound and light waves (e.g., wavelength, frequency, amplitude, Doppler effect, refraction, reflection, diffraction, interference).

9 Knowledge of teaching middle grades general science

1. Apply interdisciplinary techniques within middle grades general science classrooms.
2. Select appropriate strategies and resources, including technological resources, for general science instruction (e.g., the nature of science, life and environmental science, Earth and space science, physical science).

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Mathematics

10 Knowledge of number sense, concepts, and operations

1. Apply ratio and proportion to solve real-world problems.
2. Solve real-world problems that involve percents, decimals, fractions, and numbers expressed in scientific and exponential notation.
3. Apply number concepts, including primes, factors, and multiples, to analyze number sequences and solve problems.
4. Categorize numbers by their membership in the various subsets of the real number system (e.g., rational, irrational, integer).
5. Identify the use of the field properties of the real number system (e.g., associative, commutative, distributive) in real-world situations.
6. Determine the greatest common factor or least common multiple in a given set of numbers, and apply them in real-world situations.
7. Compare the relative values of fractions, decimals, percents, and other real numbers expressed in a variety of symbolic notations (e.g., square roots, scientific notation, exponents) used in a real-world context.

11 Knowledge of data analysis and probability

1. Determine whether mean, median, or mode is the most appropriate measure of central tendency in a given situation.
2. Interpret information from graphical representations (e.g., stem and leaf plots, box and whiskers plots, scatter plots, pictographs, circle graphs, bar graphs, histograms, line graphs).
3. Apply experimental or theoretical probabilities to make conjectures based on data.
4. Determine the probability of occurrence or nonoccurrence of an event in a real-world context.

12 Knowledge of algebra

1. Analyze and interpret relationships represented by tables, graphs, and rules.
2. Analyze functional relationships expressed as ordered pairs, rules, graphs, and mappings.
3. Determine the solution set of a pair of linear equations or linear inequalities.
4. Solve real-world problems using graphs, equations, or inequalities.

5. Apply equations or inequalities to solve real-world and mathematics problems.
6. Determine the slope, x-intercept, or y-intercept of a line given its graph, its equation, or two points on the line.
7. Convert between graphical representations and algebraic equations or inequalities.
8. Interpret or solve problems with algebraic expressions, equations, inequalities, or graphs.

13 Knowledge of geometry

1. Apply the Pythagorean theorem to solve real-world problems.
2. Apply geometric properties and relationships to solve real-world and mathematics problems.
3. Apply concepts and properties of transformational geometry (e.g., dilation, translation, rotation, reflection).
4. Apply properties of lines, angles, triangles, quadrilaterals, and circles in solving problems.
5. Identify convex, concave, regular, and irregular polygons, and determine the measure of their interior and exterior angles.

14 Knowledge of measurement

1. Solve problems involving units of measure and convert answers to a larger or smaller unit within either the metric or customary system.
2. Solve simple or more complex real-world and mathematics problems involving length, area, perimeter, circumference, weight or mass, capacity or volume, time, temperature, and angles.
3. Solve real-world problems by determining how a change in dimension (e.g., length, width, height, radius) affects other measurements (e.g., perimeter, area, surface area, volume).
4. Interpret scale drawings (e.g., number lines, blueprints, maps) to solve real-world problems.
5. Relate concepts of measurement, similarity, congruence, and proportionality in a real-world context.
6. Determine the value of a fractional part of a given geometrical figure.

15 Knowledge of teaching middle grades mathematics

1. Apply interdisciplinary techniques within middle grades mathematics classrooms.
2. Select appropriate strategies and resources, including technological resources, for mathematics instruction (e.g., algebra, financial literacy, geometry, probability, statistics).

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Social Science

16 Knowledge of history

1. Identify major themes and historical events that are related by cause and effect (e.g., exploration, settlement, growth, conflict).
2. Evaluate examples of primary source documents to show historical perspective.
3. Identify the cultural contributions and technological developments of Eastern and Western civilizations.
4. Identify significant individuals, events, and ideas that have influenced Eastern and Western civilizations.
5. Identify significant individuals, events, and ideas that have influenced economic, social, and political institutions in the United States.
6. Identify significant individuals, events, and ideas that have influenced economic, social, and political institutions in Florida.

17 Knowledge of geography

1. Identify the five themes of geography (i.e., location, place, region, movement, human-environment interaction).
2. Interpret and use maps and other graphic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.
3. Determine the factors that influence the selection of a location for a specific activity.
4. Interpret data (e.g., graph, table, survey, chart) that show human and physical characteristics of various places.
5. Infer how a given historical event has affected current human characteristics (e.g., wealth and poverty, land tenure, exploitation, colonialism, independence) of places.
6. Assess ways in which people adapt to an environment through the production and use of clothing, food, and shelter.
7. Analyze the physical, cultural, economic, and political reasons for the movement of people in the world, nation, or state.
8. Identify physical and cultural characteristics that define and differentiate the major regions of the world.

18 Knowledge of government, economics, and other social sciences

1. Identify purposes and methods for establishing and maintaining governments in various ancient and modern societies.
2. Demonstrate knowledge of the rights and responsibilities of a citizen in the world, nation, state, and community.
3. Identify major concepts of the U.S. Constitution.
4. Compare and contrast the various political systems in the world (e.g., democracy, constitutional monarchy, socialism, communism).
5. Differentiate the structures and functions of U.S. federal, state, and local governments.
6. Predict how limited resources affect the choices made by governments and individuals.
7. Compare and contrast the characteristics of various economic systems.
8. Identify the role of markets from production to distribution to consumption.

19 Knowledge of teaching middle grades social science

1. Apply interdisciplinary techniques within middle grades social science classrooms.
2. Select appropriate strategies and resources, including technological resources, for social science instruction (e.g., history, geography, civics and government, economics, other social sciences).