

Montgomery County R-II School District

Curriculum Area: SCIENCE

Kindergarten:

1. Five Senses
2. Living/Non Living
3. Plants and Animals (life cycle)
4. Weather and Seasons
5. Force/Motion- magnets
6. Universe- natural vs. manmade

First Grade:

1. Properties of Matter: Mass and Temperature
2. Investigating Motion
3. Characteristics of Plants and Animals
4. Observing Water and Weather
5. Science, Technology, and Human Activity

Second Grade:

1. Properties of Rocks and Soil
2. Forces and Motion
3. Life Cycles of Animals
4. Science, Technology, and Human Activity

Third Grade:

1. Earth, Sun, and Moon
2. Classification of Living Organisms/matter
3. Flow of energy/ food chains
4. Scientific Inquiry

Fourth Grade:

1. Living Systems/ different ecosystems, how adaptation occurs, typical animals and plants
2. Force/Motion
3. Advances/Changes
4. Scientific process/inventions
5. Simple machines/electricity
6. Rocks/Minerals

Fifth Grade:

1. Properties and Principles of Matter and Energy
2. Properties and Principles of Force and Motion
3. Characteristics and Interactions of Living Organisms
4. Changes in Ecosystems and Interactions of Organisms with their Environments
5. Processes and Interactions of the Earth's Systems
6. Composition and Structure of the Universe and the Motion of the Objects
7. Scientific Inquiry
8. Impact of Science, Technology, and Human Activity

Sixth Grade:

1. Describe beneficial and harmful activities of organisms, including humans (e.g., deforestation, overpopulation, water and air pollution, global warming, restoration of natural environments, river bank/coastal stabilization, recycling, channelization, reintroduction of species, depletion of resources), and explain how these activities affect organisms within an ecosystem
2. Describe the affect of human activities (e.g. landfills, use of fertilizers, farming, septic systems) on the quality of water

Seventh Grade:

1. Objects in motion: earth's relationship, characteristics supporting life, day/night/years, moon phases, gravity
2. Force and Motion: motion relationships, acting forces, measurement, Newton's Laws, mechanical systems, simple machines
3. Energy: renewal vs. non renewal energy, transfer of energy, forms of energy (magnetic, electrical, chemical), law of energy conservation
4. Weather and Climate: realize relationships between temperature and air movement, thermal and kinetic, and movement of earth
5. Technology: improvements for society, unintended consequences, society limitations (stem cell) , link between technology advancements and scientific discoveries
6. Inquiry: Students will be able to utilize scientific method as an explanation of for observation utilizing quantitative and qualitative data
Students will be able to communicate results via graph, oral presentations, drawings, and tables.

Eighth Grade:

1. Recognize photosynthesis is a chemical change with reactants(H_2O and CO_2) and products (energy-rich sugar molecules and O_2) that takes place in the presence of light and chlorophyll
2. Recognize oxygen is needed by all cells of most organisms for the release of energy from nutrient (sugar) molecules

3. Describe how the movement of crustal plates can cause earthquakes and volcanic eruptions that can result in mountain building and trench formations
4. Formulate testable questions and hypothesis
5. Recognize the importance of independent variable, dependent variables, control of constants and multiple trials to the design of a valid experiment
6. Use quantitative and qualitative data as support for reasonable explanations (conclusions)
7. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations
8. Use data as support for observed patterns and relationships and to make predictions to be tested
9. Communicate the procedures and results of investigations and explanations through; oral presentations, drawings and map, data tables, graphs, equations, and writing
10. Describe ways in which science and society influence one another
11. Explain how simple machines affect the amount of effort force, distance through which a force is applied, and/or direction of force while doing work

Physical Science:

1. Matter: properties, states, element compound, mixture
2. Motion and Force
3. Work and Machines
4. Energy: transfer and forms
5. Subatomic Particles: theory, periodic table
6. Interaction of Matter: bonds, reactions, compounds
7. Waves: energy, types, sound and light
8. Scientific Inquiry: methods, tools, and communication

Biology:

1. Environmental relationships
2. Environmental changes: natural or human, local or global
3. Cells, cell parts, and energy transformations
4. Biological evolution
5. Cellular reproduction: mitosis and meiosis, asexual and sexual
6. Genetics
7. Scientific inquiry; methods, tools, and communications
8. DNA: structure and function plus RNA

Biology II:

1. Animal Behavior
2. Human Body
3. Vertebrates
4. Invertebrates
5. Dissection
6. Animal Development
7. Classification
8. Animal Characteristics

Anatomy:

1. Skeletal System
2. Muscular System
3. Nervous System
4. Blood and Cardio
5. Respiratory System
6. Digestive System
7. Reproductive System
8. Language of A & P
9. Advanced Cellular Functions
10. Body Tissues
11. Skin and Body Membranes

Chemistry:

1. Fundamental characteristics of matter and how to measure them
2. Chemical and Physical properties and how they relate to the Periodic Table
3. Atomic , nuclear structure, and atomic theories
4. Acids, bases, salts, pH, and neutralization
5. Oxidation/reduction
6. Types and risks of nuclear radiation, radioactive isotopes
7. Quantum mechanical view of the atom, electron configuration
8. Periodic Table, valence Electrons, types of bonds
9. Solutions
10. Chemical and physical characteristics of H₂O as related to molecular structure
11. Chemical equations complete, balance, matter, energy

Physics:

1. Matter and energy; properties and interactions
2. Force and Motion
3. Work, Power, Energy

4. Momentum, Impulse, Newton's 2nd and 3rd Laws
5. Gases, Liquids, Solids
6. Thermodynamics, 1st and 2nd laws Specific heat work
7. Wave Phenomena Describe and calculate
8. Waves; reflection, refraction, diffraction, interference
9. Wave Interference; wave resonance
10. Mirrors and Lenses
11. Coulomb's Laws: electric fields and potential difference
12. DC Circuits
13. Electricity and Magnetism
14. Atomic and nuclear forces and applications