



STAFFORD COUNTY PUBLIC SCHOOLS

Curriculum Overview Sixth Grade Science

Course Description:

The sixth-grade science curriculum focuses on student growth in understanding the nature of science especially the premise that scientific explanations are based on logical thinking. Methods are studied for testing the validity of predictions and conclusions. Major areas of study include: basic sources of energy, their origins, transformations, and uses; the role of the sun's energy on Earth systems; the unique properties of water and its role in the environment; atomic structure and basic chemistry concepts; the organization of the solar system and the relationships among the bodies that comprise it. Environmental studies focus on renewable and nonrenewable resources, and the ecology of watershed systems emphasizing their value as natural resources.

Essential Skills/Processes:

The goals of the course are to educate the student in the material content of Sixth Grade Science, to increase science inquiry skills and logical thinking, and foster positive attitudes for further science study. There will also be preparation for Sixth Grade Science material on the Grade Eight Science Standards of Learning Test.

- The student will investigate and understand basic sources of energy, their origins, transformations, and uses
- The student will investigate and understand the role of solar energy in driving most natural processes within the atmosphere, the hydrosphere, and on the Earth's surface
- The student will investigate and understand that all matter is made up of atoms
- The student will investigate and understand the unique properties and characteristics of water and its roles in the natural and human-made environment
- The student will investigate and understand the properties of air and the structure and dynamics of the Earth's atmosphere
- The student will investigate and understand the natural processes and human interactions that affect watershed systems
- The student will investigate and understand the organization of the solar system and the relationships among the various bodies that comprise it
- The student will investigate and understand public policy decisions relating to the environment

Essential Knowledge:

Essential knowledge and skills is categorized into seven strands.

Scientific Investigation, Reasoning, and Logic

- Data collected, recorded, analyzed, and reported using appropriate metric measurement.
- Hypotheses made that involve the identification of independent and dependent variables.
- A classification system developed based on multiple attributes.
- Explanations for sequences developed.

- Data organized in charts, graphs, and diagrams and information interpreted.
- Scientific reasoning and logic demonstrated, and the nature of science being developed and reinforced.
- An emphasis on laboratory safety.

Force, Motion, and Energy

- Sources of energy such as fossil fuels, wood, wind, water, solar, and nuclear.
- Energy uses and transformations of energy from one form to another.
- Role of the sun in formation of energy sources.
- Role of solar energy in driving natural processes in the atmosphere, hydrosphere, and on the Earth's surface.
- Renewable and non-renewable energy sources.

Matter

- The atom and its component parts including historical discoveries.
- Properties of elements, compounds, and mixtures.
- Chemical symbols, formulas, and equations.
- Major elements comprising Earth, living matter, oceans, and atmosphere.
- Properties and characteristics of water, including its role as a solvent, and agent of chemical and physical weathering.
- Importance of water for human activities and influence on climate.

Matter continued

- Components and measurements of the atmosphere.
- Basic information shown by weather maps.
- Importance of protecting and maintaining good air quality.

Living Systems

- Natural processes and human interactions that affect watershed systems.
- Location and structure of Virginia's watershed systems.
- Divides, tributaries, river systems, wetlands, estuaries, river and stream processes.
- Conservation, health, and safety issues associated with watersheds.
- Water monitoring and analysis.

Interrelationships in Earth/Space Systems

- The organization of the solar system, the relationships among its component bodies, and the unique properties of the Earth as a planet.
- Relative size and distance between planets.
- Role of gravity, revolution rotation, mechanics of day and night, and phases of the moon.
- Relationship of the Earth's tilt and seasons, the cause of tides.
- History and technology of space exploration.

Resources

- Management of renewable resources such as water, air, plant life, and animal life.
- Management of nonrenewable resources such as coal, oil, natural gas, and nuclear power.
- Costs and benefits of conservation policies.