Manson School District
SCIENCE
Seventh Grade Essentials

Systems

Analyze how the parts of a system interconnect and influence each other.

- Describe the flow of matter and energy through a system**.**

Inquiry

Understand how to plan for and conduct a scientific investigation.

- Make a logical plan for scientific controlled investigation including a prediction, materials, one controlled variables, one manipulated variable, responding variable, record data, multiple trials.
- Apply understanding of how to construct a scientific explanation using evidence and logic.

Application

Apply the scientific design process to develop solutions to problems or challenges.

- Generate a solution a problem or challenge include define the problem, collect information, explore ideas, create a plan, list the steps, test solutions and document the process.
- Explain possible solutions to a problem.

Analyses of systems through inquiry and application will guide the study of the Physical, Living and Earth/Space Systems.

Physical Systems

Understand how balanced and unbalanced forces can change the motion of objects.

Earth and Space Systems

Understand and analyze the relationship between weather and climate

Understand how to classify rocks, soils, air, and water into groups based on their chemical and physical properties.

Understand the processes that continually change the surface of the Earth.

Understand the components and interconnections of Earth's systems.

- The core, the mantle, oceanic and crustal plates, landforms, the hydrosphere, and atmosphere

Living Systems

Understand how natural selection accounts for species diversity and how species change over time.

Understand how individual organisms, including cells, obtain matter and energy for life processes.

Understand how organisms in ecosystems interact with and respond to their environment and other organisms.

Manson School District
SCIENCE
Eighth Grade Essentials

Systems

Analyze how the parts of a system interconnect and influence each other.

- Describe the interactions and influences between two or more simple systems.

Inquiry

Understand how to plan for and conduct a scientific investigation.

- Make a logical plan for scientific controlled investigation including a prediction, materials, one controlled variables, one manipulated variable, responding variable, record data, multiple trials.
- Apply understanding of how to construct a scientific explanation using evidence and logic.

Applications

Apply the scientific design process to develop and implement solutions to problems or challenges.

- Generate a solution a problem or challenge include define the problem, collect information, explore ideas, create a plan, list the steps, test solutions and document the process.
- Explain possible reasons for the effectiveness of a solution.

Analyses of systems through inquiry and application will guide the study of the Physical, Living and Earth/Space Systems.

Physical Systems

Describe how properties are used to identify and categorize substances, materials and objects.

Describe the behavior of waves.

- Wave properties: amplitude, wavelength, speed, reflection, transmission, absorption

Describe and compare different forms of energy

- Compare the potential and kinetic energy within a system

Earth and Space Systems:

Describe and compare the structure and motions of the Solar System.

Living Systems:

Understand and classify organisms by their external and internal structures.

- Infer whether organisms have a biological relationship or a common ancestry

Understand that specialized cells within multicellular organisms form different kinds of tissues, organs, and organ systems to carry out life functions.

- Describe the life functions of specialized cells, tissues, organs, and organ systems

Describe and explain how organisms pass on genetic information in their life cycle and that an organism's characteristics are determined by both genetic and environmental influences.

Describe and compare human life functions and the interconnecting organ systems necessary to maintain human life.

- Compare human body systems to another organism's body system

Manson School District
SCIENCE
Ninth Grade Essentials

Systems

- Describe the function of a system's parts or subsystems including inputs, outputs, transfers, transformations and feedback of matter, energy and information in a system.

Inquiry

- Generate a logical plan for a complex scientific or simple field investigation including a hypothesis (prediction with cause-effect reason), materials, two controlled variables, one manipulated variable, responding variable, record data, multiple trials, experimental control condition when appropriate, additional validity measures and conclusion (including a connection with the supporting data).

Application

- Evaluate the scientific design process used to develop and implement solutions to problems or challenges.

Analyses of systems through inquiry and application will guide the study of the Physical, Living and Earth/Space Systems.

Physical Systems

- Apply an understanding of direction, speed, and acceleration when describing the linear motion of objects.
- Analyze energy transfers and transformations within a system, including energy conservation.
- Analyze the effects of balanced and unbalanced forces on the motion of an object.

Earth and Space Systems

- Analyze the patterns and arrangements of Earth systems and subsystems including the core, the mantle, hydrosphere, atmosphere (including weather) and tectonic plates.
- Analyze processes that have caused changes to the features of Earth's surface.
- Analyze a variety of evidence, including rock formations, fossils, and radioactive decay to construct a sequence of geologic events.

Living Systems

- Understand how organisms, including cells, use matter and energy for life processes.
- Analyze the living and nonliving factors that affect organisms in ecosystems.

Manson School District
SCIENCE
Tenth Grade Essentials

Systems

- Explain the inner connections between a system's parts or subsystems.

Inquiry

- Generate a logical plan for a complex scientific or simple field investigation including a hypothesis (prediction with cause-effect reason), materials, two controlled variables, one manipulated variable, responding variable, record data, multiple trials, experimental control condition when appropriate, additional validity measures and conclusion (including a connection with the supporting data).

Application

- Evaluate/generate a solution to a problem or challenge; include: define the problem, collect information, explore ideas, create a plan, list the steps, test solutions and document the process.

Analyses of systems through inquiry and application will guide the study of the Physical, Living and Earth/Space Systems.

Physical Systems

- Understand that all matter is made of particles called atoms and that atoms may combine to form molecules and that atoms and molecules can form solutions and mixtures.
- Understand the atomic nature of matter; i.e., how it relates to physical and chemical properties and serves as the basis for the structure and use of the periodic table.
- Understand that a substance remains the same substance when changing state. Understand that two or more substances can react to become new substances.
- Analyze sound waves, water waves and light waves using wave properties including frequency and energy and interference.
- Analyze energy transfers and transformations within a system including energy conservation; e.g., thermal energy and electrical energy.

Earth and Space Systems

- Understand that the Solar System is in a galaxy in a universe composed of an immense number of stars and other celestial bodies.

Living Systems

- Understand how to classify organisms by their external and internal structures.
- Understand the parts and functions of a cell and that specialized cells within multi-cellular organisms form different kinds of tissues, organs and organ systems to carry out life functions.
- Understand that organisms pass on genetic information in their life cycle and that an organism's characteristics are determined by both genetic and environmental influences.
- Understand human life functions and the interconnecting organ systems necessary to maintain human life.