Biology (2016)

Wright City R-II
Science
Grade 10, Duration 1 Year, 1 Credit
Required Course

Course Description

In biology, students conduct laboratory and field investigations, use scientific methods during investigations, and make informed decisions using critical thinking and scientific problem solving. Students of Biology study a variety of topics that include structures and functions of cells, ecological relationships, the interaction of biotic and abiotic components of the environment, human impact on ecosystem, heredity and chemistry.

Scope and Sequence

Timeframe	Unit	Instructional Topics
2 Week(s)	Introduction to Biology	1. Common characteristic of living organisms. 2. Use of the microscope and it's benefits for leaning biology.
2 Week(s)	Ecosystems	1. Types of energy 2. Food Webs and Food Chains 3. Ecological Relationships
4 Day(s)	Cycles	1. Water Cycle 2. Nitrogen Cycle 3. Carbon Cycle 4. Phosphorus Cycle 5. Cycles of Nature
3 Week(s)	Cells	1. Organelles of the cell
3 Week(s)	Experimental Design	1. Testable Questions

Course Details

UNIT: Introduction to Biology -- 2 Week(s)

Unit Description
The basic understanding of general biological topics will be presented.

Academic Vocabulary
adaptation
biome
biosphere
cells
community
development
ecosystem
growth
organism
homoeostasis
organization
organs
population
reproduction
respiration
response
secretion
species
stimulus
systems
tissues

TOPIC: Common characteristic of living organisms. -- 2 Day(s)

Description
Knowledge of the 8 life processes and the importance of each in living things. Understanding the levels of organization within an organism and the organisms environment.

Academic Vocabulary (What terms will students need to know?)
adaptation
biome
biosphere
cells
community
development
ecosystem
growth
organism
homoeostasis
organization
organs
population
reproduction
respiration
response
secretion
species
stimulus
systems
tissues

Learning Targets

Students will have an understanding of the 8 Life processes necessary for all living thing. They will have an understanding why reproduction is the most important.
SCI.9-12.4.3.B

Students will have an understanding of the levels of organization within an organism and within an organism's environment..
SCI.9-12.4.1.A

Students will be able to predict why a population can increase or decrease, depending on responses to changes in the environment
SCI.9-12.4.1.B

TOPIC: Food Webs and Food Chains -- 4 Day(s)

Description
Students will gain an understanding of the movement of energy and matter in an ecosystem.

Learning Targets

There is not a Missouri Standard for the use of tools in biology. The understanding of the microscope is necessary to understand unicellular organisms as well as the organelles of a cell.

UNIT: Ecosystems -- 2 Week(s)

Unit Description
The transfer of energy in an ecosystem through food webs and the cycles of nature will be introduced.

Academic Vocabulary
Abiotic Factors
Autotrophs
Biomass
Biosphere
Biotic Factors
Carnivores
Commensalism
Detritivores
Ecology
Food Chain
Food Web
Habitat
Herbivores
Heterotrophs
Mutualism
Niche
Omnivores
Parasitism
Predation
Symbiosis
Trophic levels

TOPIC: Types of energy -- 1 Day(s)

Description
Students will describe types of energy within living things.

Learning Targets

Students will understand chemical energy. They will describe how it is created and transferred.

SCI.9-12.1.2.F SCI.9-12.4.2.A

TOPIC: Food Webs and Food Chains -- 4 Day(s)

Description
Students will gain an understanding of the movement of energy and matter in an ecosystem.

Learning Targets

Students will understand predation.

SCI.9-12.4.2.A

TOPIC: Ecological Relationships -- 2 Day(s)

Description
Student will be able to identify the type of ecological relationship that exist between organisms in an ecosystem.

Academic Vocabulary (What terms will students need to know?)
Commensalism
Ecological relationships
Mutualism
Parasitism
Symbiosis

Learning Targets

Students will understand competition in an ecosystem.

SCI.9-12.4.1.A

Students will be able to identify the 3 symbiotic relationships

SCI.9-12.4.1.A

Students will understand predation.

SCI.9-12.4.1.A

UNIT: Cycles -- 4 Day(s)

Unit Description
Students will understand biogeochemical cycles. Students will describe the movement of water, carbon, nitrogen, and phosphorus.

Academic Vocabulary
Biogeochemical cycle
Combustion
Condensation
Decomposition
Denitrification
Evaporation
Fossil Fuels
Nitrogen fixation
Photosynthesis
Precipitation
Respiration
Transpiration

TOPIC: Water Cycle -- 1 Day(s)

Description
Students will describe the processes in the water cycle.

Academic Vocabulary (What terms will students need to know?)
Condensation
Evaporation
Precipitation
Transpiration

Learning Targets

Students will know the 4 processes of the water cycle.
SCI.9-12.1.2.F

Students will understand how phosphorus if essential to life.
SCI.9-12.4.1.C

TOPIC: Nitrogen Cycle -- 1 Day(s)

Description
Students will describe the processes in the nitrogen cycle.

Academic Vocabulary (What terms will students need to know?)
Nitrogen fixation
Denitrification

Learning Targets

Students will describe the 2 processes in the nitrogen cycle.
SCI.9-12.1.2.F

Students will understand how nitrogen is essential to life.
SCI.9-12.4.2.B

TOPIC: Carbon Cycle -- 1 Day(s)

Description
Students will have an understanding of the carbon cycle.

Academic Vocabulary (What terms will students need to know?)
Combustion
Decomposition
Fossil Fuels
Photosynthesis
Respiration

Learning Targets

Students will describe the 4 processes in the carbon cycle.
SCI.9-12.1.2.F

Students will understand how carbon is essential to life.
SCI.9-12.4.2.B

TOPIC: Phosphorus Cycle -- 1 Day(s)

Description
Students will describe the process of the phosphorus cycle.

Learning Targets

Students will describe the processes of the phosphorus cycle.
SCI.9-12.1.2.F

SCI.9-12.4.2.B

TOPIC: Testable Questions -- 1 Day(s)

Description
Students will write testable questions to experimental ideas. Scenerios will be used.

Learning Targets

UNIT: Cells -- 3 Week(s)

Unit Description
Students will recognize the fundamental and structural units of cells. Students will identify the organelles and how they work together to carry on the life processes. Students will identify the differences between plant cells and animal cells and how are these differences beneficial to each.

TOPIC: Organelles of the cell -- 5 Day(s)

Description
Students will investigate how structure and function of organelles go hand in hand.

Learning Targets

UNIT: Experimental Design -- 3 Week(s)

Unit Description
Students will develop an experiment using scientific method.

Academic Vocabulary
Dependent Variable
Independent Variable
Hypothesis
Testable Question

TOPIC: Testable Questions -- 1 Day(s)

Description
Students will write testable questions to experimental ideas. Scenerios will be used.

Learning Targets