

Virtual Learning Academy
Jefferson County Educational Service Center
Academic Content Standards
Science 07

Lesson 01 – Variety is the Spice of Life in Animals!

Variety is the Spice of Life in Animals!

Standard Benchmark and Indicator
S02. Life Sciences
A. Explain that the basic functions of organisms are carried out in cells and groups of specialized cells form tissues and organs; the combination of these cells make up multicellular organisms that have a variety of body plans and internal structures. (06-08)
01. Investigate the great variety of body plans and internal structures found in multicellular organisms. (07)

Lesson 02 – Variety is the Spice of Life in Plants, Fungi, and Seaweeds!

Variety is the Spice of Life in Plants, Fungi, and Seaweeds!

Standard Benchmark and Indicator
S02. Life Sciences
A. Explain that the basic functions of organisms are carried out in cells and groups of specialized cells form tissues and organs; the combination of these cells make up multicellular organisms that have a variety of body plans and internal structures. (06-08)
01. Investigate the great variety of body plans and internal structures found in multicellular organisms. (07)

Lesson 03 - Interdependence of Organisms

Interdependence of Organisms Life Science

Standard Benchmark and Indicator
S02. Life Sciences
C. Explain how energy entering the ecosystems as sunlight supports the life of organisms through photosynthesis and the transfer of energy through the interactions of organisms and the environment. (06-08)
02. Investigate how organisms or populations may interact with one another through symbiotic relationships and how some species have become so adapted to each other that neither could survive without the other (e.g., predator-prey, parasitism, mutualism and commensalism). (07)

Lesson 04 – The Relationship between Resources and Organisms in Rainforests

The Relationship between Resources and Organisms in Rainforests

Standard Benchmark and Indicator
S02. Life Sciences
B. Describe the characteristics of an organism in terms of a combination of inherited traits and recognize reproduction as a characteristic of living organisms essential to the continuation of the species. (06-08)
08. Investigate the great diversity among organisms. (07)
C. Explain how energy entering the ecosystems as sunlight supports the life of organisms through photosynthesis and the transfer of energy through the interactions of organisms and the environment. (06-08)
03. Explain how the number of organisms an ecosystem can support depends on adequate biotic (living) resources (e.g., plants, animals) and abiotic (non-living) resources (e.g., light, water and soil). (07)
S05. Scientific Inquiry
B. Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions. (06-08)
07. Use graphs, tables and charts to study physical phenomena and infer mathematical relationships between variables (e.g., speed and density). (07)

Lesson 05 – The Relationship between Resources and Organisms in Biomes

The Relationship between Resources and Organisms in Biomes

Standard Benchmark and Indicator
S02. Life Sciences
B. Describe the characteristics of an organism in terms of a combination of inherited traits and recognize reproduction as a characteristic of living organisms essential to the continuation of the species. (06-08)
08. Investigate the great diversity among organisms. (07)
C. Explain how energy entering the ecosystems as sunlight supports the life of organisms through photosynthesis and the transfer of energy through the interactions of organisms and the environment. (06-08)
03. Explain how the number of organisms an ecosystem can support depends on adequate biotic (living) resources (e.g., plants, animals) and abiotic (non-living) resources (e.g., light, water and soil). (07)
S05. Scientific Inquiry
B. Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions. (06-08)
07. Use graphs, tables and charts to study physical phenomena and infer mathematical relationships between variables (e.g., speed and density). (07)

Lesson 06 – The Effects of Overpopulation on an Ecosystem

The Effects of Overpopulation on an Ecosystem

Standard Benchmark and Indicator
S02. Life Sciences
D. Explain how extinction of a species occurs when the environment changes and its adaptive characteristics are insufficient to allow survival (as seen in evidence of the fossil record). (06-08)

04. Investigate how overpopulation impacts an ecosystem. (07)
S05. Scientific Inquiry
B. Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions. (06-08)
07. Use graphs, tables and charts to study physical phenomena and infer mathematical relationships between variables (e.g., speed and density). (07)

Lesson 07 – Natural Occurrences that Affect Earth’s Ecosystems

Natural Occurrences that Affect Earth’s Ecosystems

Standard Benchmark and Indicator
S02. Life Sciences
C. Explain how energy entering the ecosystems as sunlight supports the life of organisms through photosynthesis and the transfer of energy through the interactions of organisms and the environment. (06-08)
06. Summarize the ways that natural occurrences and human activity affect the transfer of energy in Earth's ecosystems (e.g., fire, hurricanes, roads and oil spills). (07)
D. Explain how extinction of a species occurs when the environment changes and its adaptive characteristics are insufficient to allow survival (as seen in evidence of the fossil record). (06-08)
05. Explain that some environmental changes occur slowly while others occur rapidly (e.g., forest and pond succession, fires and decomposition). (07)

Lesson 08 – Human Activities that Affect Earth’s Ecosystems

Human Activities that Affect Earth’s Ecosystems

Standard Benchmark and Indicator

06. Summarize the ways that natural occurrences and human activity affect the transfer of energy in Earth's ecosystems (e.g., fire, hurricanes, roads and oil spills). (07)
D. Explain how extinction of a species occurs when the environment changes and its adaptive characteristics are insufficient to allow survival (as seen in evidence of the fossil record). (06-08)
05. Explain that some environmental changes occur slowly while others occur rapidly (e.g., forest and pond succession, fires and decomposition). (07)
S04. Science and Technology
A. Give examples of how technological advances, influenced by scientific knowledge, affect the quality of life. (06-08)
03. Recognize that science can only answer some questions and technology can only solve some human problems. (07)

A. Explain that there are differing sets of procedures for guiding scientific investigations and procedures are determined by the nature of the investigation, safety considerations and appropriate tools. (06-08)
03. Formulate and identify questions to guide scientific investigations that connect to science concepts and can be answered through scientific investigations. (07)
B. Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions. (06-08)
07. Use graphs, tables and charts to study physical phenomena and infer mathematical relationships between variables (e.g., speed and density). (07)

Lesson 09 – Photosynthesis - the What, Where, How, and Why of It

Photosynthesis - the What, Where, How, and Why of It

Standard Benchmark and Indicator
S02. Life Sciences
C. Explain how energy entering the ecosystems as sunlight supports the life of organisms through photosynthesis and the transfer of energy through the interactions of organisms and the environment. (06-08)
07. Explain that photosynthetic cells convert solar energy into chemical energy that is used to carry on life functions or is transferred to consumers and used to carry on their life functions. (07)

Lesson 10 – Food Chains, Energy Pyramids, and Food Webs

Food Chains, Energy Pyramids, and Food Webs

Standard Benchmark and Indicator
S02. Life Sciences
C. Explain how energy entering the ecosystems as sunlight supports the life of organisms through photosynthesis and the transfer of energy through the interactions of organisms and the environment. (06-08)
07. Explain that photosynthetic cells convert solar energy into chemical energy that is used to carry on life functions or is transferred to consumers and used to carry on their life functions. (07)

Lesson 11 – What’s the Matter?

What’s the Matter?

Standard Benchmark and Indicator
S03. Physical Sciences
A. Relate uses, properties and chemical processes to the behavior and/or arrangement of the small particles that compose matter. (06-08)
01. Investigate how matter can change forms but the total amount of matter remains constant. (07)

Lesson 12 – Energy - Just Do It!

Energy - Just Do It!

Standard Benchmark and Indicator
S03. Physical Sciences
D. Describe that energy takes many forms, some forms represent kinetic energy and some forms represent potential energy; and during energy transformations the total amount of energy remains constant. (06-08)
03. Identify different forms of energy (e.g., electrical, mechanical, chemical, thermal, nuclear, radiant and acoustic). (07)

Lesson 13 – Kinetic and Potential Energy

Kinetic and Potential Energy

Standard Benchmark and Indicator
S03. Physical Sciences
D. Describe that energy takes many forms, some forms represent kinetic energy and some forms represent potential energy; and during energy transformations the total amount of energy remains constant. (06-08)
02. Describe how an object can have potential energy due to its position or chemical composition and can have kinetic energy due to its motion. (07)
04. Explain how energy can change forms but the total amount of energy remains constant. (07)

Lesson 14 – Nonrenewable Energy Sources and How They Are Used

Nonrenewable Energy Sources and How They Are Used

Standard Benchmark and Indicator
S03. Physical Sciences
D. Describe that energy takes many forms, some forms represent kinetic energy and some forms represent potential energy; and during energy transformations the total amount of energy remains constant. (06-08)
04. Explain how energy can change forms but the total amount of energy remains constant. (07)
05. Trace energy transformation in a simple closed system (e.g., a flashlight). (07)

Lesson 15 – Renewable Energy Sources - How They Are Used

Renewable Energy Sources - How They Are Used

Standard Benchmark and Indicator
S03. Physical Sciences
D. Describe that energy takes many forms, some forms represent kinetic energy and

some forms represent potential energy; and during energy transformations the total amount of energy remains constant. (06-08)
04. Explain how energy can change forms but the total amount of energy remains constant. (07)
05. Trace energy transformation in a simple closed system (e.g., a flashlight). (07)

Lesson 16 – Variables and Controls

Variables and Controls

Standard Benchmark and Indicator
S05. Scientific Inquiry
A. Explain that there are differing sets of procedures for guiding scientific investigations and procedures are determined by the nature of the investigation, safety considerations and appropriate tools. (06-08)
01. Explain that variables and controls can affect the results of an investigation and that ideally one variable should be tested at a time; however it is not always possible to control all variables. (07)
02. Identify simple independent and dependent variables. (07)

Lesson 17 – What’s in a Question?

What’s in a Question?

Standard Benchmark and Indicator
S04. Science and Technology
A. Give examples of how technological advances, influenced by scientific knowledge, affect the quality of life. (06-08)
03. Recognize that science can only answer some questions and technology can only solve some human problems. (07)
S05. Scientific Inquiry
A. Explain that there are differing sets of procedures for guiding scientific investigations and procedures are determined by the nature of the investigation, safety considerations and appropriate tools. (06-08)
03. Formulate and identify questions to guide scientific investigations that connect to science concepts and can be answered through scientific investigations. (07)

Lesson 18 – Semester Exam

Lesson 19 – Necessity is the Mother of Invention

Necessity is the Mother of Invention

Standard Benchmark and Indicator

A. Give examples of how technological advances, influenced by scientific knowledge, affect the quality of life. (06-08)
01. Explain how needs, attitudes and values influence the direction of technological development in various cultures. (07)

Lesson 20- Choosing and Using the Right Tool for the Job

Choosing and Using the Right Tool for the Job

Standard Benchmark and Indicator
S05. Scientific Inquiry
A. Explain that there are differing sets of procedures for guiding scientific investigations and procedures are determined by the nature of the investigation, safety considerations and appropriate tools. (06-08)
04. Choose the appropriate tools and instruments and use relevant safety procedures to complete scientific investigations. (07)

Lesson 21: Save the Environment? Save Money?

Save the Environment? Save Money?

Standard Benchmark and Indicator
S04. Science and Technology
A. Give examples of how technological advances, influenced by scientific knowledge, affect the quality of life. (06-08)
02. Describe how decisions to develop and use technologies often put environmental and economic concerns in direct competition with each other. (07)
S05. Scientific Inquiry
B. Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions. (06-08)
07. Use graphs, tables and charts to study physical phenomena and infer mathematical relationships between variables (e.g., speed and density). (07)

Lesson 22: Be Safe!

Be Safe!

Standard Benchmark and Indicator
S05. Scientific Inquiry
A. Explain that there are differing sets of procedures for guiding scientific investigations and procedures are determined by the nature of the investigation, safety considerations and appropriate tools. (06-08)
04. Choose the appropriate tools and instruments and use relevant safety procedures to complete scientific investigations. (07)

Lesson 23 – You Build It!

You Build It!

Standard Benchmark and Indicator
S04. Science and Technology
B. Design a solution or product taking into account needs and constraints (e.g., cost, time, trade-offs, properties of materials, safety and aesthetics). (06-08)
04. Design and build a product or create a solution to a problem given two constraints (e.g., limits of cost and time for design and production or supply of materials and environmental effects). (07)

Lesson 24 – What Do the Facts Tell Us?

What Do the Facts Tell Us?

Standard Benchmark and Indicator
S05. Scientific Inquiry
B. Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions. (06-08)
05. Analyze alternative scientific explanations and predictions and recognize that there may be more than one good way to interpret a given set of data. (07)
S06. Scientific Ways of Knowing
C. Give examples of how thinking scientifically is helpful in daily life. (06-08)
03. Describe how the work of science requires a variety of human abilities and qualities that are helpful in daily life (e.g., reasoning, creativity, skepticism and openness). (07)

Lesson 25- Earth's Spheres and Cycles

Earth's Spheres and Cycles

Standard Benchmark and Indicator
S01. Earth and Space Sciences
C. Describe interactions of matter and energy throughout the lithosphere, hydrosphere and atmosphere (e.g., water cycle, weather and pollution). (06-08)
01. Explain the biogeochemical cycles which move materials between the lithosphere (land), hydrosphere (water) and atmosphere (air). (07)

Lesson 26: Global Warming and the Greenhouse Effect

Global Warming and the Greenhouse Effect

Standard Benchmark and Indicator
S01. Earth and Space Sciences

C. Describe interactions of matter and energy throughout the lithosphere, hydrosphere and atmosphere (e.g., water cycle, weather and pollution). (06-08)
02. Explain that Earth's capacity to absorb and recycle materials naturally (e.g., smoke, smog and sewage) can change the environmental quality depending on the length of time involved (e.g. global warming). (07)

Lesson 27: The Water Cycle

The Water Cycle

Standard Benchmark and Indicator
S01. Earth and Space Sciences
C. Describe interactions of matter and energy throughout the lithosphere, hydrosphere and atmosphere (e.g., water cycle, weather and pollution). (06-08)
03. Describe the water cycle and explain the transfer of energy between the atmosphere and hydrosphere. (07)

Lesson 28: Fresh Water

Fresh Water

Standard Benchmark and Indicator
S01. Earth and Space Sciences
C. Describe interactions of matter and energy throughout the lithosphere, hydrosphere and atmosphere (e.g., water cycle, weather and pollution). (06-08)
04. Analyze data on the availability of fresh water that is essential for life and for most industrial and agricultural processes. Describe how rivers, lakes and groundwater can be depleted or polluted becoming less hospitable to life and even becoming unavailable or unsuitable for life. (07)

Lesson 29- Weather Predictions and Cloud Formations

Weather Predictions and Cloud Formations

Standard Benchmark and Indicator
S01. Earth and Space Sciences
C. Describe interactions of matter and energy throughout the lithosphere, hydrosphere and atmosphere (e.g., water cycle, weather and pollution). (06-08)
05. Make simple weather predictions based on the changing cloud types associated with frontal systems. (07)

Lesson 30: Biomes

Biomes

Standard Benchmark and Indicator

S01. Earth and Space Sciences
C. Describe interactions of matter and energy throughout the lithosphere, hydrosphere and atmosphere (e.g., water cycle, weather and pollution). (06-08)
08. Describe how temperature and precipitation determine climatic zones (biomes) (e.g., desert, grasslands, forests, tundra and alpine). (07)

Lesson 31: Weather-related Phenomenon Tornadoes, Hurricanes, Floods, Droughts

Weather-Related Phenomenon Tornadoes, Hurricanes, Floods, Droughts

Standard Benchmark and Indicator
S01. Earth and Space Sciences
C. Describe interactions of matter and energy throughout the lithosphere, hydrosphere and atmosphere (e.g., water cycle, weather and pollution). (06-08)
09. Describe the connection between the water cycle and weather-related phenomenon (e.g., tornadoes, floods, droughts and hurricanes). (07)

Lesson 32: Weather Observation, Measurement, and Map Reading

Weather Observation, Measurement, and Map Reading

Standard Benchmark and Indicator
S01. Earth and Space Sciences
C. Describe interactions of matter and energy throughout the lithosphere, hydrosphere and atmosphere (e.g., water cycle, weather and pollution). (06-08)
06. Determine how weather observations and measurements are combined to produce weather maps and that data for a specific location at one point in time can be displayed in a station model. (07)
07. Read a weather map to interpret local, regional and national weather. (07)

Lesson 33: Were the Moon Landings Faked?

Were the Moon Landings Faked?

Standard Benchmark and Indicator
S05. Scientific Inquiry
B. Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions. (06-08)
06. Identify faulty reasoning and statements that go beyond the evidence or misinterpret the evidence. (07)

Lesson 34: Cold Fusion or Illusion?

Cold Fusion or Illusion?

Standard Benchmark and Indicator
S06. Scientific Ways of Knowing
B. Explain the importance of reproducibility and reduction of bias in scientific methods. (06-08)
01. Show that the reproducibility of results is essential to reduce bias in scientific investigations. (07)
02. Describe how repetition of an experiment may reduce bias. (07)
C. Give examples of how thinking scientifically is helpful in daily life. (06-08)
03. Describe how the work of science requires a variety of human abilities and qualities that are helpful in daily life (e.g., reasoning, creativity, skepticism and openness). (07)

Lesson 35: Cure or Catastrophe?

Cure or Catastrophe?

Standard Benchmark and Indicator
S04. Science and Technology
A. Give examples of how technological advances, influenced by scientific knowledge, affect the quality of life. (06-08)
03. Recognize that science can only answer some questions and technology can only solve some human problems. (07)
S05. Scientific Inquiry
B. Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions. (06-08)
06. Identify faulty reasoning and statements that go beyond the evidence or misinterpret the evidence. (07)
S06. Scientific Ways of Knowing
B. Explain the importance of reproducibility and reduction of bias in scientific methods. (06-08)
01. Show that the reproducibility of results is essential to reduce bias in scientific investigations. (07)
02. Describe how repetition of an experiment may reduce bias. (07)
C. Give examples of how thinking scientifically is helpful in daily life. (06-08)
03. Describe how the work of science requires a variety of human abilities and qualities that are helpful in daily life (e.g., reasoning, creativity, skepticism and openness). (07)

Lesson 36

Final Exam Science 7

