

Course Description

The sixth grade curriculum helps to build a foundation of basic concepts by encouraging higher-order thinking, using science content, and emphasizing the relationship between science and the student's daily life. Consciousness of the student's environment is established through observation, questioning, investigating, classification, and communication. Emphasis is placed on actively engaging students in investigations that are interesting and meaningful to them; thus enhancing their appreciation of the natural world to encourage the students to be lifelong learners.

Scope and Sequence

Timeframe	Unit	Instructional Topics
3 Week(s)	Living Organisms	1. Cells
7 Week(s)	Ecosystems	1. Ecosystems and Populations
5 Week(s)	Matter and Energy of Physical & Chemical Changes	1. Properties and Changes in Matter of Physical and Chemical Changes
3 Week(s)	Matter and Energy of Sound & Light	1. Properties and Changes in Matter of Sound and Light
6 Week(s)	Earth Systems (Rocks, Fossils, Soil, & Weathering)	1. Sedimentary Rocks, Fossils, Soil, Weathering
4 Week(s)	Earth Systems (Weathering, Erosion, & Deposition)	1. Weathering, Erosion, and Deposition
2 Week(s)	Scientific Relevance	1. Science and Technology
Ongoing	Scientific Inquiry	1. Inquiry

Course Details**UNIT: Living Organisms** -- 3 Week(s)**Unit Description**

By the end of the unit the students will understand that cells contain a set of structures called organelles that control the various functions of the cell.

Academic Vocabulary

Cell membrane
Cell wall
Nucleus
Cytoplasm
DNA
Cholorplast
Organelle
Ribosome
Endoplasmic Reticulum (ER)
Mitochondria
Golgi apparatus (Golgi body)
Vacuole
Lysosome
Diffusion
Osmosis
Active transport
Passie transport
Unicellular
Multicellular
Bacteria
Protists
Fungi
Algae

Photosynthesis
Glucose
Xylem
Phloem
Roots
Leaves
Cells response to stimuli
Reproduce
Energy use
Growth
Development
Asexual Reproduction
Sexual Reproduction
Meiosis
Mitosis
Prokaryotes
Eukaryotes

TOPIC: Cells -- 3 Week(s)

Description

Students will learn that cells contain a set of structures called organelles that control the various functions of the cell.

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

What are the differences between unicellular and multicellular organisms?

How do the characteristics of living things vary in different organisms?

How does an organism's structure affect its ability to survive?

What does it mean to be living?

What do living things need to survive? How do the parts of living things help them to survive?

Learning Targets

Describe the common life processes necessary to survival of organism.

SCI.6.3.1.A.a

Recognize all organisms are composed of cells, the fundamental units of life, which carry on all life processes.

SCI.6.3.1.C.a

Recognize most of the organisms on Earth are unicellular and other organisms, including humans, are multicellular.

SCI.6.3.1.E.a

Identify examples of unicellular and multicellular organisms.

SCI.6.3.1.E.b

Compare and contrast the following plant and animal cell structures: cell membrane, nucleus, cell wall, chloroplast and cytoplasm.

SCI.6.3.2.A.a

Recognize the chloroplasts as the cell structure where food is produced in plants and some unicellular organisms.

SCI.6.3.2.A.b

Describe how plants use energy from the Sun to produce food and oxygen through the process of photosynthesis.

SCI.6.3.2.B.a

UNIT: Ecosystems -- 7 Week(s)

Unit Description

By the end of the unit the students will understand the changes in ecosystem and interactions of organisms with their environment.

Academic Vocabulary

Biotic
Abiotic
Soil
Soil composition
Populations
Communities
Balanced system
Ecosystem
Environment
Competition
Predation
Prey
Symbiosis
Limiting factors
Food
Water
Air
Shelter
Mutualism
Commensalisms
Parasitism
Parasite
Host
Deforestation
Overpopulation
Water pollution
Air pollution
Global warming
Restoration
River bank
Stabilization
Recycling
Channelization
Reintroduction of species
Depletion of resources
Forest fire
Flood
Volcanic eruption
Avalanche
Disease
Antibiotics
Waste break down
Producer
Consumer
Decomposer
Predator
Prey
Unicellular
Multicellular
Food chain
Food web
Oxygen cycle
Carbon dioxide cycle
Nitrogen cycle

TOPIC: Ecosystems and Populations -- 7 Week(s)**Description**

By the end of the unit the student will have an understanding of the changes in ecosystem and interactions of organisms with their environment.

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

What is the cause and effect of matter changing form and location when recycled in an ecosystem?

How do all organisms transform available energy into useable forms?

How can you compare and contrast the diversity and balance of species in an ecosystem changes when environmental conditions change?

How do living things adapt to the environment?

How can we organize materials and events to help us make sense of what we observe?

How can we safeguard our environment?

How does studying cycles help us to understand natural processes?

Learning Targets

Identify ways man depends on plants and animals for food, clothing, and shelter.

SCI.6.4.1.B.a

Identify the biotic and abiotic factors that make up an ecosystem.

SCI.6.4.1.A.a

Identify populations with a community that are in competition with one another for resources.

SCI.6.4.1.B.a

Identify the factors that affect the number and types of organisms an ecosystem can support.

SCI.6.4.1.B.b

Predict the possible effects of changes in the number and types of organisms in an ecosystem on the populations of other organisms within that ecosystem.

SCI.6.4.1.B.c

Describe the beneficial and harmful activities of organisms including humans, and explain how these activities affect organisms within an ecosystem.

SCI.6.4.1.D.a

Predict the impact on the organisms in an ecosystem.

SCI.6.4.1.D.b

Describe the possible solutions to potentially harmful environmental changes within an ecosystem.

SCI.6.4.1.D.c

Diagram and describe the transfer of energy in an aquatic food web and a land food web with reference to producer, consumers, and decomposers by the role they serve in the ecosystem.

SCI.6.4.2.A.a

Classify populations of unicellular, and multicellular organisms as producers, consumers, and decomposers by the role they serve in ecosystem.

SCI.6.4.2.A.b

Relate examples of adaptations with a species to its ability to survive.

SCI.6.4.3.C.a

UNIT: Matter and Energy of Physical & Chemical Changes -- 5 Week(s)**Unit Description**

By the end of the unit, students will understand that matter is made up of small particles called molecules that are in constant motion. Students will also understand that particles interact with other particles in predictable ways and can be classified in certain

ways.

Academic Vocabulary

Matter
Atoms
Molecules
Particles
Attraction
Kinetic Energy
Potential Energy
Energy
Temperature
Celsius
Mass
Volume
Density
Grams
Liters
Gas
Solid
Liquid
Plasma
Characteristic of Matter
Property
Gravity
Freezing Point
Melting Point
Boiling Point
Sublimation
Condensation
Evaporation
Water vapor
Precipitation
Water Cycle
Chemical Reaction
Chemical Change
Physical Reaction
Physical Change
Compound
Mixture
Solution
Law of Conservation

TOPIC: Properties and Changes in Matter of Physical and Chemical Changes -- 5 Week(s)**Description**

Investigate, Identify, and Classify that matter has mass, volume, and properties, as well as being composed of particles. Compare and contrast that mixtures and solutions have distinguish properties, and that there are appropriate ways to separate those components.

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

What is matter and how does it behave?

What is energy, where do we find it, how does it change from one form to another, and how does it affect our everyday lives?

How is energy used, and when it is used how does it interact with matter and change from one form to another?

How do forces act upon one another and with matter?

How is energy related to changes of matter?

What patterns occur when matter changes?

Can objects and the materials they are made of be classified and described by their properties?

Learning Targets

Identify matter is anything that has volume and mass.

SCI.6.1.1.A.a

Describe and compare the volumes of objects or substances directly.

SCI.6.1.1.A.b

Classify types of matter in an object into pure substance or mixtures by using their physical properties.

SCI.6.1.1.A.c

Describe and compare the masses of objects to nearest gram using a balance.

SCI.6.1.1.A.c

Describe the properties of each component in a mixture and solution.

SCI.6.1.1.B.a

Describe appropriate ways to separate the components of different mixtures.

SCI.6.1.1.B.b

Predict how solids behave when mixed with water.

SCI.6.1.1.B.c

Describe the relationship between the change in the volume of water and changes in temperature as it relates to the properties of water.

SCI.6.1.1.D.a

Describe evidence that supports the theory that matter is composed of small particles.

SCI.6.1.1.C.a

Identify and classify changes in matter as chemical and/or physical.

SCI.6.1.1.G.a SCI.6.1.1.G.c

Identify chemical changes as a result of interactions with sources of energy or other matter that form new substances.

SCI.6.1.1.G.b

Demonstrate and provide evidence that mass is conserved during a physical change.

SCI.6.1.1.I.a

UNIT: Matter and Energy of Sound & Light -- 3 Week(s)**Unit Description**

By the end of the unit, students will understand that sound and light are manifestations of waves, as well as that light behaves in

certain ways when it interacts with different media. Also gain an understanding of how humans see.

Academic Vocabulary

Waves
Mechanical wave
Sound waves
Medium
Wavelength
Reflect
Diffuse reflection
Regular reflection
Refract
Absorb
Transmit
Transfer of light energy
Electromagnetic Spectrum
Radio waves
Microwaves waves
Infrared waves
Visible light
X-rays
Gamma rays
Ultraviolet rays
Rainbow
Crest
Trough
Frequency
Amplitude
Transparent
Translucent
Opaque
Color
Prism
White light
Primary Colors
Secondary Colors
Pigments
Plane Mirror
Concave Mirror
Convex Mirror
Pinhole Camera
Iris
Lens
Pupil
Cornea
Retina
Optic Nerve
Loudness
Pitch
Sound

TOPIC: Properties and Changes in Matter of Sound and Light -- 3 Week(s)**Description**

By the end of the unit, students will learn the following: determine the properties of waves, describe how sound energy and changes in energy cause changes in loudness and pitch of a sound, and predict how the properties of the medium (air, empty space, rock) affect the speed of different types of mechanical waves (sound).

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

Why do electromagnetic waves (light) come in a range of energies and wavelengths and interact in specific ways with different types of surfaces and/or boundaries?

What are the properties of light and how does it behave?

What are the properties of sound and how does it behave?

How do humans see?

When interacting with different media, why does sound and light manifest of waves and light behave in certain ways?

Learning Targets

Determine the properties of waves.

SCI.6.1.2.A.h

SCI.6.1.2.A.i

SCI.6.1.2.A.k

SCI.6.1.2.C.a

Describe how sound energy is transferred by wave-like disturbances that spread away from the source through a medium. Using inquiry that spread away from the source through a medium. Using inquiry methods, students will describe how sound energy is transferred by wave-like disturbances that spread away from the source through a medium.

SCI.6.1.2.A.i

Describe how changes in energy cause changes in loudness and pitch of sound. Using inquiry methods, students will describe how changes in energy cause changes in loudness and pitch of a sound.

SCI.6.1.2.A.j

Predict how the properties of the medium (air, empty space, rock) affect the speed of different types of mechanical waves (sound). Using inquiry methods, students will predict how the properties of the medium (air, empty space, rock) affect the speed of different types of mechanical waves (sound).

SCI.6.1.2.A.k

Recognize and describe how energy from the Sun is transferred to Earth in a range of wavelengths and energy levels, including visible light, infrared radiation.

SCI.6.1.2.A.a

SCI.6.1.2.C.a

SCI.6.1.2.C.b

Describe how light interacts with different types of surfaces (reflection, refraction, formation of images).

SCI.6.1.2.A.b

SCI.6.1.2.A.c

SCI.6.1.2.A.d

SCI.6.1.2.A.e

SCI.6.1.2.A.f

SCI.6.1.2.A.g

SCI.6.1.2.A.h

UNIT: Earth Systems (Rocks, Fossils, Soil, & Weathering) -- 6 Week(s)**Unit Description**

By the end of the unit, student will be able to describe how sedimentary rocks form in layers over time as well as fossil evidence and inferences about how the Earth changes and its environment.

Academic Vocabulary

Rocks

Minerals

The Rock Cycle

Sedimentary Rocks

Sediments

Deposits

Igneous Rocks

Metamorphic Rocks

Magma

Inorganic

Solids

6th Grade Science

Wright City R-II
Science
Grade 6, Duration 1 Year
Required Course

Chemical Composition
Chalk
Granite
Shale
Limestone
Coal
Sandstone
Chert
Gypsum
Conglomerate
Erode
Strata
Compress
Cemented/Compacted
Fossils
Corals
Shells
Mollusks
Bones
Organic Sediments
Detrital Sediments
Chemical Sediments
Clastic
Non-clastic
Abrasive
Mantle
Core
Crust
Crustal Plates
Convergent Plate Boundaries
Divergent
Continental Drift
Sea-Floor Spreading
Theory of Plate Tectonics
Plate Tectonics
Pangaea
Laurasia
Gondwana
Concretions
Beach
Sand Bar
Levee
Earthquakes
Volcanoes
Dormant
Extinct Volcano
Shield Cone Volcano
Cinder Cone Volcano
Composite Volcano
Dome Mountain Volcano
P Waves
S Waves
L Waves
Focus
Epicenter
Seismograph
Richter Scale
Folding
Anticlines

Synclines
Faulting
Unconformity

TOPIC: Sedimentary Rocks, Fossils, Soil, Weathering -- 6 Week(s)

Description

Students will make inferences about the formation of sedimentary rocks from their physical properties, make observation and compare fossils as evidence of different types of organisms that once lived in the past that have both similarities with the differences from organisms living today, and also use fossil evidence to make inferences about changes on Earth and in its environment.

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

How do Plate Tectonics cause changes in the land and weather patterns?

What can fossils explain to us about the organisms of the past and the changes on Earth and its environment?

How does weathering and erosion effect the formation of sedimentary rocks?

Learning Targets

Make inferences about the formation of sedimentary rocks from their physical properties.

SCI.6.5.2.A.a SCI.6.5.2.D.a

Explain how the formation of sedimentary rocks depends on weathering and erosion.

SCI.6.5.2.A.b

Identify fossils as evidence some types of organisms that once lived in the past, and have since become extinct, have similarities with and differences from organisms living today.

SCI.6.5.2.D.a SCI.6.5.2.D.b

Explain the types of fossils and the processes by which they are forms.

SCI.6.5.2.D.a

Use fossil evidence to make inferences about changes on Earth and in its environment.

SCI.6.5.2.D.b

UNIT: Earth Systems (Weathering, Erosion, & Deposition) -- 4 Week(s)

Unit Description

By the end of the unit, students will understand that the earth's materials and surface features are changed through a variety of external processes, and that there are internal processes within the geosphere that cause changes in Earth's crustal plate.

Academic Vocabulary

Erosion
Soil Erosion
Erosion by Gravity
Animal Erosion
Machinery Erosion
Weathering
Glacier Weathering
Wind Erosion
Water Erosion
Deposition
Streams
Interior of the Earth
Density
Velocity
Ocean
Gravity
Chemical Weathering
Physical Weathering

6th Grade Science

Wright City R-II
Science
Grade 6, Duration 1 Year
Required Course

Surface Area
Moisture Content
Temperature
Climate
Moderate Climate
Soil
Sand
Silt
Clay
Loam
Humus
Decomposers
Decomposition
Biological Weathering
Landslides
Flash Floods
Rock Slides
Abrasion
Exfoliation
Expansion of Ice
Frost Wedging

TOPIC: Weathering, Erosion, and Deposition -- 4 Week(s)**Description**

Students will be able to categorize and distinguish between weathering, erosion, and deposition. The students will also be able to distinguish between mechanical and chemical weathering and compare processes by which each occurs. Students will formulate some factors that control the rate at which a rock weathers, and interpret the agents of erosion to features on the Earth's surface.

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

How do air, wind, and water work together?

What is erosion and its causes?

What are erosion's effects on the environment?

What can humans do to reduce the effects of erosion on Earth?

How are weathering and erosion different and related?

How are rocks formed and classified?

How are minerals formed and classified?

How does the formation of soil relate to the processes of weathering and erosion?

Can we travel to the center of the Earth?

Why do earthquakes occur?

What is plate tectonics?

Learning Targets

Define and distinguish between weathering, erosion, and deposition.

SCI.6.5.1.A.a SCI.6.5.2.A.c

Distinguish between mechanical and chemical weathering and identify processes by which each occurs.

SCI.6.5.2.A.c SCI.6.5.2.A.d SCI.6.5.3.A.b SCI.6.5.3.A.c

Identify some factors that control the rate at which a rock weathers.

SCI.6.5.1.A.a SCI.6.5.2.A.a SCI.6.5.2.A.b SCI.6.5.2.A.c SCI.6.5.2.A.d
SCI.6.5.2.B.a SCI.6.5.3.A.c

Identify the agents of erosion and relate erosion to features on the earth's surface.

SCI.6.5.2.A.b SCI.6.5.2.A.c

Analyze that the Earth's materials are limited natural resources affected by human activity.

SCI.6.5.3.A.a SCI.6.5.3.A.b SCI.6.5.3.A.c

Identify the internal processes and sources of energy with the Earth that cause changes to the Earth's crustal plates.

SCI.6.5.1.A.a SCI.6.5.2.A.d SCI.6.5.2.B.a

UNIT: Scientific Relevance -- 2 Week(s)**Unit Description**

Critique the contributions and difficulty science innovators experience as they attempt to break through accepted ideas contributing to science, technology, and human activity. Explain how technological improvements have led to the invention of new products that may improve lives here physical, social, economic, and/or environmental problems on Earth.

Academic Vocabulary

Technology
NASA

6th Grade Science

Wright City R-II
Science
Grade 6, Duration 1 Year
Required Course

Polio
Evolution
Hypotheses
Theories
Laws
MRI
CAT-scans
Doppler Radar
Telescopes
Hubble Telescopes
Fields of Science
Sonar
Fiber Optics
Alternative Fuels
AIDS
Pollution
Contributions
Inventors
Scientists
Darwinism
Copernicusism
Newton's Laws
Satellite Imagery
Infrared Goggles
Consequences
Risks

TOPIC: Science and Technology -- 2 Week(s)**Description**

By the end of the unit, the students will recognize the contributions of men and women in the fields of science and that new knowledge leads to questions and new discoveries. The students will evaluate limitations and trade-offs of technological solutions.

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

How are Science and Technology related? How are they different?

How does technology affect and influence the way people live?

Does technology and science depend on each other?

Why are outdated contributions still referred to and importance in the world of science?

What makes a scientist notable?

Learning Targets

Explain how technological improvements have led to the invention of new products that may improve lives here on Earth.

SCI.6.8.1.A.a

Identify the link between technological developments and the scientific discoveries made possible through their development.

SCI.6.8.1.B.a

Describe how the contributions of scientist and inventor, representing different cultures, races, and gender, have contributed to science, technology and human activity.

SCI.6.8.2.A.a

Describe the difficulty science innovators experience as they attempt to break through accepted ideas.

SCI.6.8.2.B.a

Describe explanations have changed over time as a result of new evidence.

SCI.6.8.2.B.b

Describe ways in which science and society influence one another.

SCI.6.8.3.B.a

Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology.

SCI.6.8.3.B.b

Describe how technological solutions to problems can have both benefits and drawbacks

SCI.6.8.1.C.a

UNIT: Scientific Inquiry -- Ongoing**Unit Description**

By the end of the year students will understand that science is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.

Academic Vocabulary

Qualitative Data

Qualitative Observation

Quantitative Data

6th Grade Science

Wright City R-II
Science
Grade 6, Duration 1 Year
Required Course

Quantitative Observation

Inference

Scientific Method
Testable Question/Problem
Hypothesis
Analysis
Discussion of Results
Science
Experiment

Hypothesis

Procedure

Data

Observation
Results
Control

Variable
Independent Variable

Dependent Variable

Constant
Control Group
Experimental Group
Conclusion

Bar Graph

Single Line Graph

Pictograph

Microscope

Thermometers

Computers

Spring Scale

Balances

Triple Beam Balance

Magnets

Graduated Cylinder

Stopwatch

6th Grade Science

Wright City R-II
Science
Grade 6, Duration 1 Year
Required Course

Metric Ruler

Metric System

Length

Weight

Density

Millimeter

Mass

Gram

Volume

Milliliter

Temperature

Celsius

Force (Weight)

Newton

Second

Millisecond

Phenomena

Specimens

Theories

Laws

TOPIC: Inquiry [Ongoing]

Description

By the end of the year student will develop testable questions and hypothesis, design and conduct a valid experiment, analyze experiments, solve scientific problems, interrupt data, communicate results of experiments, and differentiate between types of scientific research.

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

How do you design and conduct a valid experiment?

What is the scientific method?

What builds a strong testable question and hypothesis ?

Why do scientists use systems of measurement and problem solving strategies?

Why do scientists interrupt their data?

Why do scientists analyze their experiments?

Learning Targets

Develop testable questions and hypothesis.

SCI.6.7.1.A.a

Design and conduct a valid experiment.

SCI.6.7.1.A.b

SCI.6.7.1.A.c

Analyze experiments.

SCI.6.7.1.A.d

SCI.6.7.1.C.c

SCI.6.7.1.C.e

Interrupt data

SCI.6.7.1.C.a

SCI.6.7.1.C.b

SCI.6.7.1.C.e

Communicate results of experiments

SCI.6.7.1.A.d

SCI.6.7.1.C.d

SCI.6.7.1.D.a

Differentiate between types of scientific research and solve scientific problems

SCI.6.7.1.A.e

Determine the appropriate tools and techniques in data collecting

SCI.6.7.1.B.a

SCI.6.7.1.B.b

SCI.6.7.1.B.c

SCI.6.7.1.B.d

SCI.6.7.1.B.e

SCI.6.7.1.B.f

SCI.6.7.1.C.c