

Science (7)

Science

Grade(s) 7th, Duration 1 Year, 1 Credit
Required Course

Course Overview

Life Science deals with all living things and their relationship to one another and to their environment. The areas of study this class will explore are parts of the following branches of life science: zoology, botany, microbiology, genetics, and ecology.

7th grade life science is a yearlong course designed to cover a variety of topics. Topics covered in first semester will include the scientific method and microorganisms, as well as cells and cellular functions. Second semester will discuss topics such as heredity and genetics, as well as, plants, animals and the way they relate to each other and their surroundings. We will have several dissections during second semester. Students will participate in a variety of hands-on activities and complete many laboratories and projects throughout the year.

Timeframe	Unit	Scope And Sequence	
		Instructional Topics	
Ongoing	Scientific Method	1. Steps of the Scientific method	
2 Week(s)	Living things	1. What is life?	
2 Week(s)	Viruses and Bacteria	1. Viruses 2. Bacteria 3. Viruses, Bacteria, and your health	
2 Week(s)	Protists and Fungi	1. Protists 2. Algal Blooms 3. Fungi	
2 Week(s)	Cell Structure and Function	1. Discovering Cells 2. Looking inside cells 3. Chemical Compounds in Cells 4. The Cell in its Environment	
2 Week(s)	Cell Processes and Energy	1. Photosynthesis 2. Respiration 3. Cell Division 4. Cancer	
2 Week(s)	Genetics	1. Mendel's Work 2. Probability and Heredity 3. The Cell and Inheritance 4. The DNA Connection	
2 Week(s)	Modern Genetics and Changes over time	1. Human Inheritance 2. Human Genetic Disorders	
2 Week(s)	Sponges, Cnidarians, and Worms	1. What is an Animal? 2. Animal Symmetry 3. Sponges and Cnidarians 4. Worms	
3 Week(s)	Mollusks, Arthropods, and Echinoderms	1. Mollusks 2. Arthropods 3. Insects and Insect Ecology 4. Echinoderms	
3 Week(s)	Fishes, Amphibians, and Reptiles	1. Vertebrates 2. Fishes 3. Amphibians 4. Reptiles	
3 Week(s)	Birds and Mammals	1. Birds and Flight 2. Mammals	
2 Week(s)	Animal Behavior	1. Behavior Patterns, and Migration	
3 Week(s)	Populations and Communities	1. Living things and the environment 2. Populations 3. Interactions Among Living Things	
3 Week(s)	Ecosystems and Biomes	1. Energy Flow in Ecosystems 2. Cycles of Matter 3. Biomes	

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Materials and Resources

Prentice Hall Science Explorer textbook. We will use the smaller textbooks broken down into 5 smaller books. We will use textbooks A, B, C, and E during the course.

Prerequisites

Completion of 6th grade.

Course Details

Unit: Scientific Method

Duration: Ongoing

Unit Overview

Students will learn the steps associated with the Scientific Method.

Materials and Resources

Textbooks, pencil and paper.

Academic Vocabulary

See course vocabulary list.

Summative Assessment

Teacher Evaluation of practical exercises.

Topic: Steps of the Scientific method

Duration: Ongoing

Topic Overview

The steps of the Scientific Method (Inquiry) are as follows:

- 1). Pose a Question
- 2). Develop a Hypothesis
- 3). Design an Experiment
- 4). Complete the Experiment and gather data
- 5). Interpret Data and Draw Conclusions
- 6). Communicate your results

Learning Targets

Students will learn and use the steps of the Scientific Method.

Students will learn and use the 6 steps of the Scientific Method to complete an experiment.

Unit: Living things

Duration: 2 Week(s)

Unit Overview

- 1
List the characteristics all living things share.
Explain where living things come from.
Identify what all living things need to survive.
- 2
Tell why biologists classify organisms
Relate the levels of organisms to the relationships between organisms
Explain how taxonomic keys are useful
Explain the relationship between evolution and classification
- 3
List characteristics used to classify organisms
Contrast bacteria and archaea
Name the kingdoms within Eukarya
- 4
Contrast the atmosphere of early Earth with today's atmosphere
Describe how scientists hypothesize that life arose on Earth

Materials and Resources

Textbook
Living and non-living object

Academic Vocabulary

See course vocabulary list

Summative Assessment

Teacher made assessment using textbook guided software.

Topic: What is life?

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Topic Overview

List the characteristics all living things share.
Explain where living things come from.
Identify what all living things need to survive.

Learning Targets

The learner will be able to explain what makes an organism abiotic or biotic.
The learner will be able to explain what makes an organism abiotic or biotic.

Unit: Viruses and Bacteria

Duration: 2 Week(s)

Unit Overview

Viruses, Bacteria, and Your Health

Materials and Resources

Textbook

Academic Vocabulary

See course vocabulary list

Summative Assessment

Teacher made assessment

Topic: Viruses

Duration: 3 Day(s)

Topic Overview

List characteristics of viruses and state reasons why viruses are considered nonliving
Describe the components of the basic structure of a virus
Explain how both active and hidden viruses multiply
Discuss both positive and negative ways that viruses affect living things

Learning Targets

Discuss the characteristics of Viruses, how they multiply, and their global impact.
Discuss how a virus can spread from person to person. Explain how viruses can infect all humans across the globe.

Topic: Bacteria

Duration: 4 Day(s)

Topic Overview

Name and describe structures, shapes, and sizes of a bacterial cell
Compare autotrophs to heterotrophs, and explain how energy is released through respiration
Describe the conditions under which bacteria thrive and reproduce frequently
Explain the roles of bacteria in the production of oxygen and food, in environmental recycling and cleanup, and in health and medicine

Learning Targets

Discuss the characteristics of Bacteria.
Describe the characteristics of bacteria, how they obtain food and energy, how they reproduce, and their role in nature.

Topic: Viruses, Bacteria, and your health

Duration: 3 Day(s)

Topic Overview

List four ways that infectious diseases can spread
Describe treatments available for bacterial and viral diseases
Describe how to protect yourself against infectious diseases

Learning Targets

Discuss how Infectious Diseases spread
Discuss what infectious diseases are, and how they can spread from person to person, or animal to person, or object to person. Discuss why it is important to wash your hands and take other important health steps to avoid getting sick.

Unit: Protists and Fungi

Duration: 2 Week(s)

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Unit Overview

Discuss Protists, Algal Blooms, and Fungi

Materials and Resources

Textbook

Academic Vocabulary

See course Vocabulary list

Summative Assessment

Teacher made assessment

Topic: Protists

Duration: 3 Day(s)

Topic Overview

Describe the characteristics of animal-like protists
Describe the characteristics of plantlike protists
Describe the characteristics of funguslike protists

Learning Targets

Describe characteristics of Protists.
Discuss the three types of protists and their characteristics.

Topic: Algal Blooms

Duration: 3 Day(s)

Topic Overview

Describe the causes and effects of red tides
Describe the causes and effects of eutrophication

Learning Targets

Discuss what happens during an Algal Bloom.
Discuss Red Tides, and Eutrophication.

Topic: Fungi

Duration: 2 Day(s)

Topic Overview

Name the characteristics fungi share
Explain how fungi reproduce
Describe the roles fungi play in nature

Learning Targets

Discuss the characteristics of Fungi.
Discuss the cell structure, reproduction, and role fungi play in nature.

Unit: Cell Structure and Function

Duration: 2 Week(s)

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Unit Overview

Discuss the structure of cells and what each of their various functions are.

Materials and Resources

Textbook, pencil and paper

Academic Vocabulary

Organelle
cell wall
cell membrane
nucleus
cytoplasm
mitochondria
endoplasmic reticulum
ribosome
Golgi body
chloroplast
vacuole
lysosome
element
compound
carbohydrate
protein
amino acid
enzyme
lipid
nucleic acid
DNA
RNA
selectively permeable
diffusion
osmosis
passive transport
active transport

Summative Assessment

Chapter 1 Test

Topic: Discovering Cells

Duration: 2 Day(s)

Topic Overview

Discuss the first cells and how we discovered what cells looked like and where they were found.

Learning Targets

Discuss how we learned what cells are and what they look like.
Discuss what a cell is, and look at them through a microscope.

Topic: Looking inside cells

Duration: 2 Day(s)

Topic Overview

What goes into a cell; what are cells made of?

Learning Targets

Discuss what is on the inside of cells, and discuss what each part does.
Look at the inside of different cells and discuss their structure and function.

Topic: Chemical Compounds in Cells

Duration: 2 Day(s)

Topic Overview

Discuss what chemicals make up the different parts of the cell.

Learning Targets

Discuss the elements and compounds that go into each part of the cell.
Discuss what carbohydrates, lipids, nucleic acids, and water have to do with your cells.

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Topic: The Cell in its Environment

Duration: 2 Day(s)

Topic Overview

Discuss the cell and its relationship to its environment.

Learning Targets

Diffusion and Osmosis

Discuss why cells undergo Diffusion and Osmosis in order to maintain stable internal conditions.

Unit: Cell Processes and Energy

Duration: 2 Week(s)

Unit Overview

Cell Processes and Energy

Materials and Resources

Discuss the cellular processes and how they use energy

Academic Vocabulary

photosynthesis

autotroph

heterotroph

pigment

chlorophyll

stomata

respiration

fermentation

cell cycle

interphase

replication

mitosis

chromosome

cytokinesis

cancer

mutation

tumor

chemotherapy

Summative Assessment

Chapter 2 test

Topic: Photosynthesis

Duration: 2 Day(s)

Topic Overview

Describe how some cells gather their energy from the sun.

Learning Targets

Discuss the stages of Photosynthesis

Discuss the role of photosynthesis and the environment

Topic: Respiration

Duration: 3 Day(s)

Topic Overview

Discuss what respiration is and how it is a process used not only by animals but by all cells.

Learning Targets

Discuss respiration and how it is used in cells. Discuss how fermentation occurs in our bodies.

Explain how the process works and how we can use these processes to our advantage.

Topic: Cell Division

Duration: 3 Day(s)

Topic Overview

Interphase, Mitosis, Cytokinesis

Learning Targets

Discuss the stages of cell division

Discuss the steps of cell division including, Interphase, Mitosis, and Cytokinesis

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Topic: Cancer

Duration: 3 Day(s)

Topic Overview

Discuss what cancer is, and how it develops

Learning Targets

Discuss what cancer is and how we can treat it and prevent it.

How cancer begins and what may cause it, as well as possible treatment options.

Unit: Genetics

Duration: 2 Week(s)

Unit Overview

Discuss Genetics and the Science of Heredity

Materials and Resources

Textbook, pencil and paper

Academic Vocabulary

heredity
trait
genetics
gene
alleles
fertilization
purebred
dominant alleles
recessive alleles
hybrid
probability
Punnett square
phenotype
genotype
homozygous
heterozygous
codominance
meiosis
mRNA
tRNA

Summative Assessment

Chapter 3 test

Topic: Mendel's Work

Duration: 3 Day(s)

Topic Overview

Discuss Mendel's work for genetics

Learning Targets

Describe the results of Mendel's experiments

Identify what controls the inheritance of traits in organisms

Topic: Probability and Heredity

Duration: 2 Day(s)

Topic Overview

Define probability and describe how it helps explain the results of genetic crosses.

Learning Targets

Explain what is meant by genotype and phenotype

tell what codominance is

Topic: The Cell and Inheritance

Duration: 2 Day(s)

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Required Course

Topic Overview

Describe the role of chromosomes play in inheritance

Learning Targets

Identify the events that occur during meiosis

Explain the relationship between chromosomes and genes

Topic: The DNA Connection

Duration: 3 Day(s)

Topic Overview

Explain what forms the genetic code called DNA

Learning Targets

Describe how a cell produces proteins

Identify how mutations can affect an organism

Unit: Modern Genetics and Changes over time

Duration: 2 Week(s)

Unit Overview

Discuss modern genetics and how organisms change over time.

Materials and Resources

textbook, pencil and paper

Academic Vocabulary

multiple alleles
sex chromosomes
sex-linked gene
carrier
genetic disorder
pedigree
karyotype
selective breeding
inbreeding
hybridization
clone
genetic engineering
gene therapy
genome
species
fossil
adaptation
evolution
scientific theory
natural selection
variation
mold
cast
relative dating
extinct
fossil record
radioactive dating
radioactive element
half-life
gradualism

Summative Assessment

Chapter 4/5 test

Topic: Human Inheritance

Duration: 3 Day(s)

Topic Overview

Identify some patterns of inheritance in humans

Learning Targets

Describe the functions of the sex chromosomes

Explain the relationship between genes and the environment

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Required Course

Topic: Human Genetic Disorders

Duration: 3 Day(s)

Topic Overview

Identify two major causes of genetic disorders in humans.

Learning Targets

Explain how geneticists trace the inheritance of traits.

Describe how genetic disorders are diagnosed and treated

Unit: Sponges, Cnidarians, and Worms

Duration: 2 Week(s)

Unit Overview

Discover the world of Sponges, Cnidarians, and Worms

Materials and Resources

Textbook, pencil, paper, examples of each Sponges, Cnidarian, and Worms

Academic Vocabulary

Cell
Tissue
organ
adaptation
sexual reproduction
fertilization
asexual reproduction
phylum
vertebrate
invertebrate
bilateral symmetry
radial symmetry
larva
cnidarian
polyp
medusa
colony
coral reef
parasite
host
free-living organism
scavenger
anus
closed circulatory system

Summative Assessment

Chapter 1 Test

Topic: What is an Animal?

Duration: 3 Day(s)

Topic Overview

Describe what makes an Animal based on its structure and organization.

Learning Targets

Explain how animals are classified

Identify four functions that enable animals to meet their basic needs

Topic: Animal Symmetry

Duration: 3 Day(s)

Topic Overview

Define Symmetry

Learning Targets

Infer general characteristics of an animal based on its symmetry

Does it have radial symmetry or bilateral symmetry

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Required Course

Topic: Sponges and Cnidarians

Duration: 5 Day(s)

Topic Overview

Identify the characteristics of Sponges and Cnidarians

Learning Targets

Explain the importance of coral reefs

Explain the ecosystems affected by the loss of coral reef

Topic: Worms

Duration: 4 Day(s)

Topic Overview

Identify the three main phyla of worms

Learning Targets

Describe the characteristics of each worm phylum

Describe the similarities and differences of the different phyla of worm

Unit: Mollusks, Arthropods, and Echinoderms

Duration: 3 Week(s)

Unit Overview

Discuss the characteristics of the different types of Mollusks, Arthropods, and Echinoderms

Materials and Resources

Paper, Pencil, textbook, examples of each phyla of Mollusk, Arthropod, and Echinoderm

Academic Vocabulary

Mollusk
Open circulatory system
gill
gastropod
herbivore
carnivore
radula
bivalve
omnivore
cephalopod
arthropod
exoskeleton
molting
antenna
crustacean
metamorphosis
arachnid
abdomen
insect
thorax
complete metamorphosis
pupa
gradual metamorphosis
nymph
food chain
ecology
producer
consumer
decomposer
pollinator
pesticide
biological control
echinoderm
endoskeleton
water vascular system
tube feet

Summative Assessment

Chapter 2 Test

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Required Course

Topic: Mollusks

Duration: 3 Day(s)

Topic Overview

Identify the main characteristics of mollusks

Learning Targets

Describe the major groups of mollusks and tell how they differ

Using common characteristics determine the differences in Mollusks

Topic: Arthropods

Duration: 4 Day(s)

Topic Overview

Identify the main characteristics of arthropods

Learning Targets

Describe how crustaceans, arachnids, and centipedes/millipedes differ

Compare and contrast the different groups of Arthropods

Topic: Insects and Insect Ecology

Duration: 5 Day(s)

Topic Overview

Identify the main characteristics of Insects

Learning Targets

Explain why insects are an important part of the food chain

Name two ways in which insects interact with their environment

Topic: Echinoderms

Duration: 3 Day(s)

Topic Overview

List the main characteristics of Echinoderms

Learning Targets

Name the major groups of echinoderms

Describe the characteristics that place each echinoderm into groups

Unit: Fishes, Amphibians, and Reptiles

Duration: 3 Week(s)

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Required Course

Unit Overview

Describe the similarities of different Vertebrates such as fish, amphibians and reptiles

Materials and Resources

Textbook, paper, pencil, examples of fish, amphibians, and reptiles

Academic Vocabulary

chordate
notochord
vertebrate
ectotherm
endotherm
fish
cartilage
swim bladder
amphibian
tadpole
lung
atrium
ventricle
habitat
reptile
urine
kidney
amniotic egg
fossil
paleontologist
sedimentary rock

Summative Assessment

Chapter 3 test

Topic: Vertebrates

Duration: 5 Day(s)

Topic Overview

Describe the characteristics that chordates share. Describe how their history came to be determined through rocks and fossils

Learning Targets

Describe the main characteristics shared by all vertebrates
Describe what scientists can learn from studying fossils

Topic: Fishes

Duration: 4 Day(s)

Topic Overview

Name the main characteristics of fishes

Learning Targets

Name the major groups of fishes
Describe how each group of fishes differ

Topic: Amphibians

Duration: 4 Day(s)

Topic Overview

Describe amphibian characteristics

Learning Targets

Examine how adult amphibians are adapted for life on land
Describe how amphibians differ in their life cycles

Topic: Reptiles

Duration: 4 Day(s)

Topic Overview

Describe Reptile characteristics

Learning Targets

Identify adaptations that reptiles have made to survive on land

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Required Course

Contrast each of the three main groups of reptiles

Unit: Birds and Mammals

Duration: 3 Week(s)

Unit Overview

Compare and contrast Birds and Mammals

Materials and Resources

Textbook, Paper, Pencil, and examples of feathers, and charts to show flight

Academic Vocabulary

Bird
Contour feather
Down feather
Crop
Gizzard
Lift
Mammal
Mammary gland
Diaphragm
Monotreme
Marsupial
Gestation period
placental mammal
placenta

Summative Assessment

Chapter 4 test

Topic: Birds and Flight

Duration: 6 Day(s)

Topic Overview

Describe the characteristics of birds

Learning Targets

Describe the characteristics of birds.
Explain how birds are able to achieve flight.

Topic: Mammals

Duration: 4 Day(s)

Topic Overview

Describe the characteristics of Mammals

Learning Targets

Describe the three types of mammals
Compare and contrast the different groups of mammals

Unit: Animal Behavior

Duration: 2 Week(s)

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Required Course

Unit Overview

Discuss why animals behave the way they do.

Materials and Resources

Textbook, pencil, paper, video camera, and smart board

Academic Vocabulary

behavior
stimulus
response
instinct
learning
imprinting
conditioning
trial-and-error learning
insight learning
pheromone
aggression
territory
courtship behavior
society
circadian rhythm
hibernation
migration
transmitter
receiver
satellite

Summative Assessment

Chapter 5 Test

Topic: Behavior Patterns, and Migration

Duration: 8 Day(s)

Topic Overview

Explain animal behavior

Learning Targets

Explain the different types of animal behavior and why they behave like they do
Discuss the migratory patterns of different animals

Unit: Populations and Communities

Duration: 3 Week(s)

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Grade(s) 7th, Duration 1 Year, 1 Credit
Required Course

Unit Overview

Describe how living things interact in populations and communities

Materials and Resources

Textbook, pencil, paper, projector and smart board

Academic Vocabulary

Organism
habitat
biotic factor
abiotic factor
photosynthesis
species
population
community
ecosystem
ecology
estimate
birth rate
death rate
immigration
emigration
population density
limiting factor
carrying capacity
succession
primary succession
pioneer species
secondary succession
host
parasite
parasitism
commensalism
mutualism
symbiosis
natural selection
adaptations
niche
competition
predation
predator
prey

Summative Assessment

Chapter 1 test

Topic: Living things and the environment

Duration: 3 Day(s)

Topic Overview

Identify the needs that must be met by the living parts of an environment

Learning Targets

Identify biotic and abiotic factors in an environment
Describe the levels of organizations within an ecosystem

Topic: Populations

Duration: 3 Day(s)

Topic Overview

Describe methods used to study the size of a population

Learning Targets

Explain the causes for changes in population size
Identify the factors that cause population change

Topic: Interactions Among Living Things

Duration: 3 Day(s)

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Required Course

Topic Overview

Explain how an organisms adaptations help it survive

Learning Targets

Describe the major kinds of interactions among organisms in an ecosystem
Identify the three types of symbiotic relationships

Unit: Ecosystems and Biomes

Duration: 3 Week(s)

Unit Overview

Discuss the cycles and energy flows in different ecosystems and biomes

Materials and Resources

textbook, pencil, paper, models, and videos on ecosystems

Academic Vocabulary

producer
consumer
herbivore
carnivore
omnivore
scavenger
decomposer
food chain
food web
energy pyramid
water cycle
evaporation
condensation
precipitation
nitrogen fixation
estuary
biome
canopy
understory
desert
grassland
savanna
deciduous tree
coniferous tree
tundra
permafrost
exotic species
climate
biogeography
continental drift
dispersal

Summative Assessment

Chapter 2 test

Topic: Energy Flow in Ecosystems

Duration: 4 Day(s)

Topic Overview

Name and describe the energy roles that organisms play in an ecosystem

Learning Targets

Explain how energy moves throughout an ecosystem
Describe how much energy is available at each level of an energy pyramid

Topic: Cycles of Matter

Duration: 4 Day(s)

Topic Overview

Name and describe the process involved in the cycles of matter

Learning Targets

Explain how carbon and oxygen are recycled in ecosystems

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Define and describe the nitrogen cycle

Topic: Biomes

Duration: 3 Day(s)

Topic Overview

Name six major Biomes found on Earth

Learning Targets

Name and describe the factors that determine the type of biome found in an area

Describe what makes each biome unique
