

**7th Grade
Life Science
Curriculum**

TOPIC 3 Weeks Total

The Study of Living Things: Classification

(Kingdoms, Levels of Classification, Dichotomous Key tool)

STANDARD

MS-LS1-1 From Molecules to Organisms: Structures and Processes

Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

MS-LS4-2 Biological Evolution: Unity and Diversity

Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.

STUDENT OBJECTIVE

One week

- List the characteristics of living things.
- List the six kingdoms, and provide two example characteristics of each.

Two weeks

- List the seven levels of classification.
- Explain the importance of scientific names.
- Explain how scientific names are written.
- Explain how dichotomous keys help in identifying organisms.

EVIDENCE and ASSESSMENT

● **Formatively Assess**

“Is It Alive?” inquiry, classification charts, kingdoms charts, using a dichotomous key, word wall hunts, matching, reading exercises using informational text, informative quizzes and feedback/conferencing.

● **Summative Assessment**

“Create a Dichotomous Key” Project, formal assessment/ standardized

● **Instructional Technology**

Generation Genius <https://www.generationgenius.com/?share=DADF2>

BrainPOP <https://www.brainpop.com/search/?keyword=classification>

PBS Learning Media <https://www.pbslearningmedia.org/subjects/science/life-science/>

Scholastic Study Jams

<http://studyjams.scholastic.com/studyjams/jams/science/plants/kingdoms-of-life.htm>

<http://studyjams.scholastic.com/studyjams/jams/science/animals/kingdoms-of-life.htm>

TOPIC 3 Weeks Total

Ecosystems: Interaction, Energy, and Dynamics (Food chain, Web, Pyramid and Symbiotic Relationships)

STANDARD

MS-LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS-LS2-2 Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

MS-LS2-3 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

STUDENT OBJECTIVE

- Distinguish between abiotic and biotic environments.
- Explain how populations, communities, ecosystems and the biosphere are related.

Two weeks

- Describe the functions of producers, consumers, and decomposers in an ecosystem.
- Distinguish between a food chain and a food web.
- Explain how energy flows through a food web.

One week

- Distinguish between the types of competition.
- Give examples of predator and prey.
- Distinguish between mutualism, commensalism, and parasitism.

EVIDENCE and ASSESSMENT

- **Formatively Assess**
Word wall hunts, interactive food webs, symbiotic relationship charts, matching, reading exercises using informational text, informative quizzes and feedback/conferencing.
- **Summative Assessment**
“Create an Ecosystem” Project, formal assessment/ standardized
- **Instructional Technology**
Generation Genius <https://www.generationgenius.com/?share=347CA>
<https://www.generationgenius.com/?share=F6F80>
BrainPOP <https://www.brainpop.com/search/?keyword=ecosystems>
PBS Learning Media <https://www.pbslearningmedia.org/subjects/science/life-science/>
Scholastic Study Jams
http://studyjams.scholastic.com/studyjams/jams/science/index.htm?topic_id=ecosys

<https://studyjams.scholastic.com/studyjams/jams/science/ecosystems/ecosystems.htm>
<https://studyjams.scholastic.com/studyjams/jams/science/ecosystems/food-chains.htm>
<https://studyjams.scholastic.com/studyjams/jams/science/ecosystems/food-webs.htm>
<https://studyjams.scholastic.com/studyjams/jams/science/ecosystems/symbiosis.htm>

TOPIC 3 Weeks Total

From Molecules to Organisms: Cell Structures and Processes (Prokaryotic Bacterial Cells and Eukaryotic Plant and Animal Cells)

STANDARD

MS-LS1-1 Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

MS-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.

STUDENT OBJECTIVE

One week

- Describe the difference between unicellular and multicellular organisms.
- Explain why cells are so small.
- List the advantages of being multicellular.
- Explain the differences between prokaryotic and eukaryotic cells.
- State the parts of the cells theory and relate its impact on the study of cell biology.

Two weeks

- Explain the function of each part of a eukaryotic cell.
- Describe the difference between a plant and animal cell.

EVIDENCE and ASSESSMENT

- **Formatively Assess**

Venn diagrams and foldable comparisons, cell riddles, cell color coding diagrams, organelle charts, word wall hunts, matching, reading exercises using informational text, informative quizzes and feedback/conferencing.

- **Summative Assessment**

“CSI Cell Crime Scene Investigation” Activity, “Cell Analogy” drawing or writing Project, formal assessment/ standardized

- **Instructional Technology**

Generation Genius <https://www.generationgenius.com/?share=6DF9B>

BrainPOP <https://www.brainpop.com/search/?keyword=cells>

PBS Learning Media <https://www.pbslearningmedia.org/subjects/science/life-science/>

Scholastic Study Jams

<http://studyjams.scholastic.com/studyjams/jams/science/animals/animal-cells.htm>

21st Century Life and Career Standards

9.2.8.B.1 Research careers within the 16 Career Clusters® and determine attributes of career success.

- Forensic scientist, cell biologist, stem cell research

TOPIC 2 Weeks Total

From Molecules to Organisms: Cell Structures and Processes (Photosynthesis and Cell Division)

STANDARD

MS-LS1-5 Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

MS-LS1-6 Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.

MS-LS1-7 Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.

STUDENT OBJECTIVE

One weeks

- Explain how cells produce new cells. Highlight the differences in unicellular and multicellular organisms's cell division.
- Distinguish the difference between binary fission and mitosis.
- Discuss the importance of mitosis.
- Explain how cell division differs in animal and plant cells.

One weeks

- Describe the energy needs of various types of organisms.
- Describe photosynthesis and cellular respiration. Provide the formula for each process.
- Compare photosynthesis and cellular respiration. Discuss the relationship between the two processes.
- Describe the process of fermentation.

EVIDENCE and ASSESSMENT

- **Formatively Assess**
Photosynthesis and cellular respirations comparison chart, equation set up manipulatives, cell division story/ comic strip sequence, word wall hunts, matching, reading exercises using informational text, informative quizzes and feedback/conferencing.
- **Summative Assessment**

“Cell Processes Chart and Map” Project, formal assessment/ standardized

- **Instructional Technology**

Generation Genius <https://www.generationgenius.com/?share=1869C>

BrainPOP <https://www.brainpop.com/search/?keyword=cell+division>

<https://www.brainpop.com/search/?keyword=photosynthesis>

PBS Learning Media <https://www.pbslearningmedia.org/subjects/science/life-science/>

Scholastic Study Jams

<http://studyjams.scholastic.com/studyjams/jams/science/plants/photosynthesis.htm>

<http://studyjams.scholastic.com/studyjams/jams/science/animals/animal-life-cycles.htm>

TOPIC 4 Weeks Total

Heredity: Inheritance and Variation of Traits

(Mendelian Genetics, Traits, and Punnett Squares)

STANDARD

MS-LS3-1 Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.

MS-LS3-2 Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

STUDENT OBJECTIVE

Two weeks

- Explain the experiments of Gregor Mendel; their significance and importance to modern day genetics.
- Define and distinguish between the terms dominant and recessive traits.
- Explain how genes and alleles are related to genotype and phenotype.
- Use the information in a Punnett square.

Two weeks

- Describe the basic structure of a DNA molecule.
- Explain how DNA molecules can be copied.
- Define mutation and give examples.
- Evaluate a pedigree chart and the information obtained from it.

EVIDENCE and ASSESSMENT

- **Formatively Assess**

Punnett square word problems, using a pedigree chart activity, identifying mutations by example/manipulatives, word wall hunts, matching, reading exercises using informational text, informative quizzes and feedback/conferencing.

- **Summative Assessment**

“Flip a Coin” Inheritance Lab, Genetics “Escape Room” Activity, “Genetic Disease or Condition” Project, formal assessment/ standardized

- **Instructional Technology**

Generation Genius <https://www.generationgenius.com/?share=F1D38>

<https://www.generationgenius.com/?share=1B8B9>

BrainPOP <https://www.brainpop.com/search/?keyword=heredity>

PBS Learning Media <https://www.pbslearningmedia.org/subjects/science/life-science/>

Scholastic Study Jams

<http://studyjams.scholastic.com/studyjams/jams/science/human-body/heredity.htm>

21st Century Life and Career Standards

9.2.8.B.1 Research careers within the 16 Career Clusters® and determine attributes of career success.

- Geneticist, stem cell research, ancestry analysis, prosthetics, reproductive technology, oncologist.

TOPIC 3 Weeks Total

Biological Evolution: Unity and Diversity

(Darwin, Natural Selection, and Mutations)

STANDARD

MS-LS4-1 Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.

MS-LS4-2 Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.

MS-LS4-3 Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.

MS-LS4-4 Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.

MS-LS4-5 Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.

STUDENT OBJECTIVE

- Explain how fossils are dated.
- Describe the geological time scale and the important information it provides scientists.
- Explain how fossils provide evidence that organisms have evolved over time.
- Identify three ways that organisms can be compared to support the theory of evolution.

One week

- Describe the steps of Darwin's theory of evolution by natural selection.
- Explain how mutations are important to evolution.

Two weeks

- Give examples of natural selection in action.
- Outline the process of speciation.

EVIDENCE and ASSESSMENT

- **Formatively Assess**

Making and identifying "Different Fossil Types" Lab, word wall hunts, matching, Peppered Moth Lab, reading exercises using informational text, informative quizzes and feedback/conferencing.

- **Summative Assessment**

"Animal Adaptation" Project, formal assessment/ standardized

- **Instructional Technology**

Generation Genius <https://www.generationgenius.com/?share=A2FA4>

BrainPOP <https://www.brainpop.com/search/?keyword=evolution>

PBS Learning Media <https://www.pbslearningmedia.org/subjects/science/life-science/>

Scholastic Study Jams

<http://studyjams.scholastic.com/studyjams/jams/science/animals/animal-adaptations.htm>

<http://studyjams.scholastic.com/studyjams/jams/science/plants/plant-adaptations.htm>

<https://studyjams.scholastic.com/studyjams/jams/science/ecosystems/changes-ecosystems.htm>

TOPIC 3 Weeks Total

From Molecules to Organisms: Structures and Processes

(Maintaining Biodiversity and Individual species role within an Ecosystem)

STANDARD

MS-LS2-1 Ecosystems: Interactions, Energy, and Dynamics

Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS-LS2-2 Ecosystems: Interactions, Energy, and Dynamics

Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

MS-LS1-3 Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

STUDENT OBJECTIVE

- Students will learn about specific topics such as why biodiversity is important and why conserving biodiversity and biogeography is so essential to preserving the environment.
- Explain the principles of conservation biology.
- Explain the concepts of extinction, species conservation, and biodiversity.
- Explain how the human dimension (human behavior, economics, land use, and others) affects the conservation of species.
- Evaluate strategies and tools used to conserve species or habitat at risk of extinction or destruction.

EVIDENCE and ASSESSMENT

- **Formatively Assess**

Word wall hunts, matching, reading exercises using informational text, informative quizzes and feedback/conferencing.

- **Summative Assessment**

Putting it all together “Endangered Species” Project, formal assessment/ standardized

- **Instructional Technology**

Generation Genius <https://www.generationgenius.com/?share=39CC5>

BrainPOP <https://www.brainpop.com/science/diversityoflife/invertebrates/>

<https://www.brainpop.com/science/diversityoflife/vertebrates/>

<https://www.brainpop.com/science/diversityoflife/sponges/>

<https://www.brainpop.com/science/diversityoflife/insects/>

<https://www.brainpop.com/science/diversityoflife/mollusks/>

<https://www.brainpop.com/science/diversityoflife/cnidarians/>

Scholastic Study Jams

<https://studyjams.scholastic.com/studyjams/jams/science/ecosystems/changes-ecosystems.htm>

21st Century Life and Career Standards

9.2.8.B.1 Research careers within the 16 Career Clusters® and determine attributes of career success.

- Various careers and vocations in the field of Ecology, Environmental Conservation, Conservationist, Wildlife Zoologist