

# 8th Grade Life Science

Science

Grade(s) 8th, Duration 1 Year, 1 Credit  
Required Course

## Course Overview

Life Science is the study of living organisms and their systems on Earth. The students will learn how to observe, predict, study, and question. This course covers topics in the Cell Anatomy, Ecosystems and Evolution.

Timeframe	Unit	Scope And Sequence
		Instructional Topics
3 Week(s)	Classifying & Exploring Life	1. Characteristics of Life 2. Classifying Organisms 3. Exploring Life
4 Week(s)	Cell Structure & Function	1. Cells & Life 2. The Cell 3. Moving Cellular Material 4. Cells and Energy
2 Week(s)	From a Cell to an Organism	1. The Cell Cycle and Cell Division 2. Levels of Organization
12 Week(s)	Life Science Ecosystems	1. Standards Covered from Ecosystems
Ongoing	Science Fair Research	1. Science Fair
7 Week(s)	Life Science Evolution, Unity and Diversity	1. Standards Covered From Evolution
Ongoing	MAP Testing Review	

## Course Details

### Unit: Classifying & Exploring Life

Duration: 3 Week(s)

#### Unit Description

This unit covers basic introductory information for life science including the characteristics of life, classifying organisms, and the microscope.

#### Topic: Characteristics of Life


Duration: 1 Week(s)

##### Topic Description (short)

This topic covers the six characteristics used to classify living from non-living things.

##### Learning Targets

SC.6-8.LS1.A.1 -- Provide evidence that organisms (unicellular and multicellular) are made of cells and that a single cell must carry out all of the basic functions of life. [Clarification Statement: Emphasis is on developing evidence that living things are made of cells, distinguishing between living and non-living things, and understanding that living things may be made of one cell or many and varied cells.]

Learning Targets linked to Priority Standard = 

#### Topic: Classifying Organisms

Duration: 1 Week(s)

##### Topic Description (short)

This topic explains how humans group and classify organisms. It covers binomial nomenclature, dichotomous keys, and cladograms.

#### Topic: Exploring Life

Duration: 1 Week(s)

##### Topic Description (short)

This topic introduces students to the microscope. It covers the invention of, the different types, and the importance of microscopes.

### Unit: Cell Structure & Function

Duration: 4 Week(s)

#### Unit Description

This unit covers macromolecules, organelles, cellular transport, and the relationship between cells and energy.

#### Topic: Cells & Life

Duration: 1 Week(s)

##### Topic Description (short)

This topic gives the student a basic understanding of what a cell is and the four major macromolecules used and produced by cells.

# 8th Grade Life Science

Science

Grade(s) 8th, Duration 1 Year, 1 Credit

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**Topic:** The Cell

**Duration:** 1 Week(s)

## Topic Description (short)

This topic covers the structure and function of organelles.

## Learning Targets

SC.6-8.LS1.A.2 -- Develop and use a model to describe the function of a cell as a whole and ways parts of the cells contribute to that function. [Clarification Statement: Emphasis is on the cell functioning as a whole system and the primary role of identified parts of the cell, specifically the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall.]

Learning Targets linked to Priority Standard = +

**Topic:** Moving Cellular Material

**Duration:** 1 Week(s)

## Topic Description (short)

This topic covers how cells maintain homeostasis by moving waste and nutrients across the cell membrane.

## Learning Targets

SC.6-8.LS1.A.4 -- Present evidence that body systems interact to carry out key body functions, including providing nutrients and oxygen to cells, removing carbon dioxide and waste from cells and the body, controlling body motion/activity and coordination, and protecting the body.

Learning Targets linked to Priority Standard = +

**Topic:** Cells and Energy

**Duration:** 1 Week(s)

## Topic Description (short)

This topic introduces the basics of photosynthesis and cellular respiration at the cellular level.

## Learning Targets

SC.6-8.LS1.C.1 -- Construct a scientific explanation based on evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.

Learning Targets linked to Priority Standard = +

**Unit:** From a Cell to an Organism

**Duration:** 2 Week(s)

## Unit Description

This unit introduces students to the cell cycle, cell reproduction, and the levels of organization of multicellular organisms.

**Topic:** The Cell Cycle and Cell Division

**Duration:** 1 Week(s)

## Topic Description (short)

This topic introduces the cycle of growth for a cell and how cells divide to create new cells.

**Topic:** Levels of Organization

**Duration:** 1 Week(s)

## Topic Description (short)

This topic covers how multicellular organisms are organized with all cells and systems working together.

## Learning Targets

SC.6-8.LS1.A.3 -- Develop an argument supported by evidence for how multicellular organisms are organized by varying levels of complexity; cells, tissue, organs, organ systems.

Learning Targets linked to Priority Standard = +

**Unit:** Life Science Ecosystems

**Duration:** 12 Week(s)

## Unit Description

Ecosystems

**Topic:** Standards Covered from Ecosystems

**Duration:** Ongoing

## Learning Targets

SC.6-8.LS2.A.1 -- Analyze and interpret data to provide evidence for the effects of resource availability on individual organisms and populations of organisms in an ecosystem. [Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.]

SC.6-8.LS2.A.2 -- Construct an explanation that predicts the patterns of interactions among and between the biotic and abiotic factors in a given ecosystem. [Clarification Statement: Relationships may include competition, predation, and symbiosis.]

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SC.6-8.LS2.B.1 -- Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. [Clarification Statement: Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems, including food chains and food webs.]

SC.6-8.LS2.C.1 -- Construct an argument supported by empirical evidence that explains how changes to physical or biological components of an ecosystem affect populations. [Clarification Statement: Emphasis is on recognizing patterns in data and making inferences about changes in populations, defining the boundaries of the system, and on evaluating empirical evidence supporting arguments about changes to ecosystems.]

SC.6-8.LS2.C.2 -- Evaluate benefits and limitations of differing design solutions for maintaining an ecosystem. [Clarification Statement: Examples of design solutions could include water, land, and species protection, and the prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.]

Learning Targets linked to Priority Standard = +

**Unit:** Science Fair Research

**Duration:** Ongoing

**Topic:** Science Fair

**Duration:** 3 Week(s)

## Learning Targets

SC.6-8.ETS1.A.1 -- Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

SC.6-8.ETS1.B.1 -- Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

SC.6-8.ETS1.B.2 -- Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

SC.6-8.ETS1.B.3 -- Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Learning Targets linked to Priority Standard = +

**Unit:** Life Science Evolution, Unity and Diversity

**Duration:** 7 Week(s)

**Topic:** Standards Covered From Evolution

**Duration:** Ongoing

## Topic Description (short)

This is an overview of the standards and learning targets covered in this unit.

## Learning Targets

SC.6-8.LS4.A.1 -- Analyze and interpret evidence from the fossil record to infer patterns of environmental change resulting in extinction and changes to life forms throughout the history of the Earth. [Clarification Statement: Examples of evidence include sets of fossils that indicate an environment, anatomical structures that indicate the function of an organism in the environment, and fossilized tracks that indicate behavior of organisms.]

SC.6-8.LS4.B.1 -- 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. [Clarification Statement: Emphasis is on using simple probability statements and proportional reasoning to construct explanations.]

SC.6-8.LS4.B.2 -- Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. [Clarification Statement: Emphasis is on synthesizing information from reliable sources about the influence of humans on genetic outcomes in artificial selection (such as genetic modification, animal husbandry, and farming practices).]

SC.6-8.LS4.C.1 -- Interpret graphical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

Learning Targets linked to Priority Standard = +

**Unit:** MAP Testing Review

**Duration:** Ongoing