

**Science Standards**

**Biology**

**Course Overview:** Biology is a required tenth grade science class at Turtle Lake High School. This course will review the characteristics, processes, and diversity of life on Earth. The course is intended to be a challenging review and introduction of important biological ideas.

**Biology Essential Questions (Essential standards are the standards all students will learn as they complete the course.)**

* Students can identify systems and organs of the human body.
* Students appreciate the function of the systems and organs of the human body.
* Students understand how the human body changes throughout its life.
* Students know major disorders that effect major systems and organs of the human body.
* Students will understand that their choices affect the world around them.

**Unit 1: What is Biology? (6 days)**

**Description:** Unit 1 will review basic laboratory safety procedures, equipment, how to use the lab equipment to students, and the scientific method. Students will also review how to work with the metric system, its prefixes, base units, and conversions. Finally students will be introduced to various branches of biology and possible careers in those fields.

**Standards**

1. The students will know what Science is, and understand its four branches and what is studied in each of them.
2. The students will explore the many branches of Biology and study careers associated with them.
3. The students will identify and understand the format of the metric system. Including base units, prefixes, and the process of converting from one unit to another.
4. The students will understand the steps of the scientific method will be able to apply it when solving a problem.

**Unit 2: Ecology (12 days)**

**Description:** Unit 2 will introduce basic principles of ecology to students. Students will study how our world is ecologically balanced and the value of living and non-living things in its ecosystems.

**Standards**

1. The students will study the interactions of organisms and investigate the role of competition within communities. (HS-LS2-1, HS-LS2-6)
2. The students will explore major biological communities and investigate the biotic and abiotic factors associated with them. (HS-LS2-8)
3. The students will explore the cycles found in nature and their importance and understand how energy flows throughout the environment. (HS-LS2-3, HS-LS2-4, HS-LS2-5)
4. The students will understand how ecosystems have changed over the years and the impact human activity has had on them. (HS-LS2-2, HS-LS2-6, HS-LS2-7, HS-LS2-8, HS-LS4-6)

**Unit 3: The Cell and its Processes (12 days)**

**Description:** Unit 3 will study the basic chemistry behind all living things, cell structure, their processes, and organelles. Students will understand how a cell is organized and its importance to all living things.

**Standards**

1. The students will review the structure and make up of atoms and how they relate to makeup of biological compounds and cells. (HS-LS1-6)
2. The students will explore the history of cells, the cell theory, and the current models of cellular structure. (HS-LS1-2)
3. The students will understand the steps and significance of the different types of cellular division, including mitosis and meiosis. (HS-LS1-4, HS-LS3-2)
4. The students will investigate the processes involved with and the interconnections between photosynthesis and cellular respiration. (HS-LS1-3, HS-LS1-5, HS-LS1-6, HS-LS1-7, HS-LS2-3, HS-LS2-5)

**Unit 4: Genetics (12 days)**

**Description:** Unit 4 will study the importance of heredity. Students will also review the genetic terminology, history, and current applications.

**Standards**

1. The students will understand basic principles and terminology of genetics. (HS-LS1-1, HS-LS3-3)
2. The students will investigate how traits are impacted by our environment. (HS-LS1-2, HS-LS3-2)
3. The students will study of the makeup of DNA and its role it plays with genes and traits. (HS-LS1-1, HS-LS3-1)
4. The students will explore the processes involved with converting the information from DNA into a living organism. (HS-LS1-1, HS-LS1-2, HS-LS3-1)

**Unit 5: Evolution and History of Life (6 days)**

**Description:** Unit 5 will study how our world has changed over time. The steps and results of natural selection will be highlighted as well as the study of geologic time.

**Standards**

1. The students will study the eras, periods, and epochs of geologic time and how Earth has changed throughout each of these segments. (HS-LS4-5)
2. The students will investigate process of life development on Earth and explore theories associated with them. (HS-LS4-1, HS-LS4-2, HS-LS4-3)
3. The students will study the significance of natural selection with evolution and the development of species on Earth. (HS-LS4-4, HS-LS4-5)

**Unit 6: Classification of Life (12 days)**

**Description:** Unit 6 will study how living things are categorized and the characteristics of each of the six Kingdoms of life.

**Standards**

1. The students will study the history of prokaryotic and eukaryotic cells and explore how living things are organized into taxons. (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)
2. The students will investigate the form and function of viruses and how they impact life. (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)
3. The students will explore the kingdoms of the bacteria and study their characteristics and significance. (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)
4. The students will explore the Kingdom Protista and study their characteristics and significance. (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)
5. The students will explore the Kingdom Fungi and study their characteristics and significance. (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)

**Unit 7: Invertebrates (20 days)**

**Description:** Unit 7 will study the group of animals without backbones. Taxonomy, characteristics, structures and examples of invertebrates will be investigated.

**Standards**

1. The students will learn the characteristics of the Kingdom Animalia and the body plans and terminology associated with it. (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)
2. The students will study the taxonomy, characteristics, and examples of simple invertebrates (Porifera, Cnidaria, Platyhelminthes, Nematoda, and Rotifera). (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)
3. The students will study the taxonomy, characteristics, and examples of advanced invertebrates (Mollusca, Annelida, Arthopoda, and Echinodermata). (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)
4. The students will study the taxonomy, characteristics, and examples of simple chordates (Urochordata and Cephalochordata). (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)

**Unit 8: Vertebrates (18 days)**

**Description:** Unit 8 will study the group of animals with backbones. Taxonomy, characteristics, structures and examples of vertebrates will be investigated.

**Standards**

1. The students will study the taxonomy, characteristics, and examples of fish (Agnatha, Chondrichthyes, and Osteichthyes). (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)
2. The students will study the taxonomy, characteristics, and examples of amphibians and reptiles (Amphibia and Reptilia). (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)
3. The students will study the taxonomy, characteristics, and examples of birds and mammals (Aves and Mammalia). (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)
4. The students will understand the body plan of humans and the organ systems associated with it. (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)

**Unit 9: Plants (6 days)**

**Description:** Unit 9 will study the Kingdom Plantae. Plant characteristics, structures, and processes will be investigated in this unit.

**Standards**

1. The students will study the taxonomy, characteristics, and examples of plants. (HS-LS1-1, HS-LS1-2, HS-LS3-1, HS-LS4-4)
2. The students will investigate the anatomy and physiology of plants. (HS-LS1-5, HS-LS1-5)
3. The students will explore how plants have changed over time. (HS-LS4-4)