



Advanced Life Science - Animals  
High School

**1.0 Understands and applies the skills of scientific inquiry.**

- 1.1 Uses scientific inquiry to design, conduct, and analyze scientific investigations.
- 1.2 Identifies questions and concepts that guide scientific investigations.
- 1.3 Understands that different kinds of questions suggest different kinds of investigations.
- 1.4 Uses appropriate models when necessary.
- 1.5 Develops hypothesis.
- 1.6 Identifies controls and variables.
- 1.7 Designs and executes scientific investigations.
- 1.8 Selects and uses appropriate tools, technology and techniques to gather data.
- 1.9 Makes appropriate qualitative and quantitative observations.
- 1.10 Recognizes the importance of multiple trials with reproducible results.
- 1.11 Organizes data and observations efficiently, including creating appropriate tables and graphs.
- 1.12 Analyzes and evaluates the data and observations.
- 1.13 Integrates data and observations to draw appropriate conclusions.
- 1.14 Accounts for errors in investigations.
- 1.15 Uses evidence to infer possible applications or extensions for further inquiry.
- 1.16 Uses various methods to communicate experimental methods, observations, results, and interpretations.
- 1.17 Uses appropriate safety procedures when conducting investigations.
- 1.18 Recognizes that safety concerns change with different procedures.
- 1.19 Knows locations and appropriate uses of the safety equipment in the classroom.

**3.0 Understands and applies concepts, principles and theories pertaining to life and its interactions.**

- 3.1 Understands and applies knowledge of the cell and its processes.
  - Applies knowledge of prokaryotic cell organization and eukaryotic cell organization to the principle of classification.
  - Analyzes the importance of cell specialization in the identification and function of the major phyla of animals.

3.2 Understand the cycling of matter and the flow of energy through ecosystems.

Utilizes knowledge of energy requirements to differentiate between the kingdoms of life.

Describes how the biodiversity of a particular biome is influenced by autotroph diversity.

3.3 Understand and apply knowledge of the molecular basis of heredity.

Utilizes knowledge of molecular basis of heredity to explain why genetic variation exists.

Provides example of how species change over time as a consequence of genetic variation.

3.4 Understands and applies knowledge of biological evolution.

Diagrams and explains how species change over time as a consequence of a variety of factors: genetic variation, overpopulation, competition for resources, natural selection (survival of fittest).

Understands that evolution is a shift in gene frequencies.

Describes how current diverse species are related by descent from common ancestors.

Provides examples of how the evolution of one species can impact the evolution of another.

Develops cladograms to organize groups or organisms based on evolutionary relationships.

3.5 Understands and applies knowledge of the behavior of organisms.

Applies the characteristics that all living things share in common to identify living things.

Compares the current classification system with previous models.

Explains that biological classification is based on evolutionary relationships.

Applies differing levels of classification to group organisms based on evolutionary relationships.

Describes the importance and apply the concepts of binomial nomenclature.

Develops cladograms to organize groups or organisms based on evolutionary relationships.

Identifies and explains key characteristics that distinguish the major plant, protist, fungi, and bacterial phyla.

Defends the classification of a living thing based on key characteristics and evolutionary descent.

Explains how embryonic development indicates body complexity.

Discusses the levels of tissue development seen in the animal kingdom and use them to relate to complexity.

Identifies different body plans seen in the animal kingdom and use them to relate to complexity of each phylum.

Identifies and explain key characteristics that distinguish the major animal phyla.

Identifies challenges that each major animal phylum is confronted with and determines the body systems/organs involved in overcoming the challenge.

Relates specific cell structures to life functions for each animal phylum.

Identifies key structures/organs in each phylum and describe their function in relation to their structure.

Explains the increase in evolutionary complexity seen in the major animal phyla over earlier life.

Compares and contrasts body systems/organs between each major animal phylum and use them to defend evolutionary advancement.

3.6 Understands and applies knowledge of the interdependence of organisms and their interactions with the environment.

Describes the multiple ways plant biodiversity is measured and discuss the importance of biodiversity for a stable system.

Uses data to predict which regions will have greater biodiversity based on solar input (periodicity and angle), precipitation and temperature.

Discusses how humans have altered ecosystem interactions and predict the consequences.