

# Biology B

## SCOPE OF COURSE

This course is divided into two semesters of study (A & B) comprised of five units each. The second half of the course (B) provides a comprehensive exploration of reproduction, genetics, classification of various organisms, evolution, and ecology. Laboratory activities embedded within each unit allow for hands-on, practical applications of various concepts and the interrelationships that exist at different levels within the living world.

## SEQUENCE OF SKILLS

### UNIT 1 – Reproduction

- Introduction
- Asexual vs. Sexual Reproduction
- Asexual Reproduction
- Sexual Reproduction in Plants
- Investigating a Typical Flower
- Plant Growth and Development
- Investigating Seed and Plant Development
- Sexual Reproduction
- Male Reproductive System
- Female Reproductive System
- Development and Embryology
- Reproductive Technology

### UNIT 2 – Genetics

- Genetics – What Makes Us Each Unique?
- Determining Phenotypes
- Asexual Reproduction
- Sexual Reproduction
- Meiosis and Sexual Reproduction
- Laboratories:
  - Meiosis
  - DNA Separation Simulation
  - Karyotyping
- Components of DNA – The Stuff We Are Made Of
- Constructing a DNA Model
- Genes to Proteins
- DNA Mutations
- Genetic Engineering

### UNIT 3 – Classification

- The Need for Classification
- What is Biological Classification?
- Naming Organisms: The Principles of Taxonomy
- How to Classify: Use a Classification Key
- Classifying Trees by Using Their Leaves
- Laboratory: Animal Classification
- More Applications of the Animal Classification Lab
- Modern Taxonomy: Biosystematics
- Biosystematics Today
- A Species Problem: Are the wolf and dog members of the same species?
- The Science of Biosystematics: Evidences of Relationship
- Modern Classification: Problem Solving

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## SEQUENCE OF SKILLS

### UNIT 4 – Evolution

- Where It All Began
- Evidence of Evolution From Fossils
- Evolution: Change Over Time
- Evidence of Evolution In the Fossil Record
- Laboratories:
  - Finch
  - Comparative Similarities
  - Constructing a Cladogram
- Modern Evolution
- Natural Selection of Alleles
- Mechanisms of Change
- The Peppered Moth - Survival of the Fittest
- Comparative Similarities of Evolution
- Path of Humans

### UNIT 5 – Ecology

- Levels of Organization
- Laboratories:
  - Biodiversity
  - Foreign Invaders: Ecological Succession
  - Saving a Habitat
  - Ecosystem in a Bottle
  - Ecosystem Damage
- Energy Systems
- Competition Shapes Communities
- Cycling of Ecosystem Materials
- Limits to Growth
- Human Impact
- Dangers to the Ecosystem