

Biology A

SCOPE OF COURSE

This course is divided into two semesters of study (A & B) comprised of five units each. The first half of the course (A) provides a comprehensive exploration of the definition of life, the scientific method, cell structure, the chemical processes for energy production, life at the cellular and multicellular levels, and the various body systems that work together to sustain life. 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 – The Science Called Biology

- Introduction to Biology
- Problem Solving: The Scientific Method
- Laboratories:
 - Investigating the Scientific Method
 - Investigating Measurement
 - Investigating Changes in a Biological Material
 - Investigating the Compound Light Microscope
- Making, Organizing, and Analyzing Observations
- Line Graphs
- Bar Graphs
- Circle Graphs / Pie Charts
- Interview

UNIT 2 –The Characteristics of Life

- The Definition of Life
- Using Life's Characteristics to Define It
- Organizing the Characteristics of Life
- The Scientific Definition of Life
- Properties of Life
- Life Activities:
 - Nutrition
 - Respiration
 - Synthesis, Growth, Reproduction
 - Transport
 - Laboratory Activity: Investigating the Transport of Water in a Living Organism
 - Excretion
 - Regulation
- Are Viruses Alive?

UNIT 3 – The Chemistry of Life

- The Chemical Nature of Life
- What Are Living Things Made Of?
- The Making of Chemical Compounds:
 - Ionic Bonding
 - Covalent Bonding
- A Study of pH
- An Example of the Importance of pH to the Living World
- Acid Rain
- The Organic Compounds of Life
- Testing for the Compounds of Life
- Enzymes
- Investigating Enzyme Activity
- The Bag of Chemicals

Biology A

SEQUENCE OF SKILLS

UNIT 4 – The Cell

- Cells: The Basic Unit of Life
- Our City’s Outer Wall—The Cell Membrane
- Moving Around the City—Osmosis and Diffusion
- Laboratories:
 - Osmosis/Diffusion
 - Looking at Cells
 - Modeling Mitosis (Cell Division)
- How Cells Make Energy:
 - Step 1: Glycolysis
 - Step 2: The Mitochondrion
- Using ATP—The Making and Breaking of the City’s Energy Chips
- The City’s Factory and Packaging Plant—The Endoplasmic Reticulum and Golgi Apparatus
- The City’s Government Building and Control Center—The Nucleus
- The Reason Why Our City Is Small
- The Many Different Jobs of Cells

UNIT 5 – Life at the Cellular and Multicellular Levels

- Introduction
- Nutrition
- Transport
- Blood
- Respiration
- Excretion
- Regulation
 - Nervous System
 - Endocrine System
- Locomotion
 - Skeletal System
 - Muscular System
- Integumentary System
- Human Anatomy