

SYLLABUS

SUBJECT: Biology I

TEXTBOOK: Biology, Pearson Prentice Hall, Miller, K. & Levine, J., 2010
ISBN# 0-13-036701-X

COURSE

DESCRIPTION: Prerequisite: None

The intent of biology is to open the door to a lifetime of understanding of and appreciation for nature. It will also provide a variety of opportunities to develop and practice the art of “doing science”. Units of study include: characteristics of living things, chemical basis of living things, cytology, heredity and genetics, the history of living organisms, taxonomy, plants, animals, dynamics of ecosystems, reproduction current (controversial) science issues, and the environmental awareness.

IN ACCORDANCE TO ILLINOIS STATE LEARNING STANDARDS, STUDENTS WILL

- Formulate hypotheses referencing prior research and knowledge (11.A.4a)
- Conduct controlled experiments or simulations to test hypotheses. (11.A.4b)
- Collect, organize and analyze data accurately and precisely. (11.A.4c)
- Formulate alternative hypotheses to explain unexpected results. (11.A.4e)
- Using available technology, report, display and defend to an audience conclusions drawn from investigations. (11.A.4f)
- Explain how genetic combinations produce visible effects and variations among physical features and cellular functions of organisms. (12.A.4a)
- Describe the structures and organization of cells and tissues that underline basic life functions including nutrition, respiration, cellular transport, biosynthesis and reproduction. (12.A.4b)
- Describe processes by which organisms change over time using evidence from comparative anatomy and physiology, embryology, the fossil record, genetics and biochemistry. (12.A.4c)
- Compare physical, ecological, and behavioral factors that influence interactions and interdependence of organisms. (12.B.4a)
- Simulate and analyze factors that influence the size and stability of populations within ecosystems. (12.B.4b)
- Estimate and suggest ways to reduce the degree of risk involved in science activities. (13.A.4a)

- Assess the validity of scientific data by analyzing the results, sample set, sample size, similar previous experiments, possible misrepresentations of data presented and potential sources of error. (13.A.4b)
- Describe how scientific knowledge, explanations and technological designs may change with new information over time (e.g., the understanding of DNA, the design of computers) (13.A.4c)
- Explain how peer review helps to assure the accurate use of data and improves the scientific process. (13.A.4d)
- Compare and contrast scientific inquiry and technological design as pure and applied sciences. (13.B.4a)
- Analyze a particular occupation to identify decisions that may be influenced by a knowledge of science, (13.B.4b)
- Evaluate claims derived from purported scientific studies used in advertising and marketing strategies. (13.B.4e)

LOCAL ASSESSMENT: 1st semester - * Timed cell drawing with labels/definitions
 * Semester Pretest
 * Semester Post-test / exam

2nd semester - * Semester Pretest
 * Semester Post-test / exam

REQUIRED TECHNOLOGY ASIGNMENTS:

PowerPoint – Classification
 Spreadsheet – Phenotypes
 Internet research – Project
 Word processing – Project

SUGGESTED ASIGNMENTS:

Oral quizzing
 Labs - microscope, experiments, explorations
 Group discussions
 Daily exercises (written/oral)
 Teacher evaluation
 Drawings
 Creating 3-D models (cell, DNA)
 Research projects
 Tests
 Quizzes
 Collaborative teaming
 Power point presentations
 Composition assessment

Internet activities

Open ended experiments (long term, multiple days)
with results stated in a written lab report

**FIRST SEMESTER
TOPICS:**

Chapter 1: The Science of Biology
Chapter 2: The Chemistry of Life
Chapter 3: The Biosphere
Chapter 6: Humans in the Biosphere
Chapter 7: Cell Structure and Function
Chapter 8: Photosynthesis
Chapter 9: Cellular Respiration
Chapter 10: Cell Growth and Division

**SECOND SEMESTER
TOPICS:**

Chapter 11: Introduction to Genetics
Chapter 12: DNA and RNA
Chapter 13: Genetic Engineering
Chapter 14: The Human Genome
Chapter 15: Darwin's Theory of Evolution
Chapter 16: Evolution of Populations
Chapter 17: The History of Life
Chapter 18: Classification