Course Syllabus

Biology I Accelerated

HMH Biology: Nowicki

SCIENCE IS THE SEARCH FOR UNDERSTANDING OF THE NATURAL WORLD THROUGH INQUIRY AND EXPERIMENTATION.

This is a molecular approach to biology and is designed to be an introductory course for college-bound students intending to major in a science or related field. Learning is emphasized by inquiry and application. Evaluation criteria include exams, quizzes, laboratory investigations, and out of class assignments. The Pennsylvania Keystone Exam will be given at the end of course.

The following is an outline of the material that is expected to be covered in this course. It may be altered as the course progresses, when necessary

1

CHEMICAL NATURE OF LIFE

Big Idea: Structure relates to function.

Scientific Method, Nature of Matter, Chemical Properties & Reactions, Properties of Water & Acids & Bases

1.3, 2.1, 2.2

2

ORGANIC AND BIOCHEMISTRY

Big Idea: Structure relates to function.

Carbon Compounds, Carbohydrates, Lipids, Proteins, Nucleic Acids, & Chemical Reactions with Enzymes

2.3-2.5

3

MICROBIOLOGY STRUCTURE & FUNCTION

Big Idea: Structure relates to function.

Characteristics of Life, Viruses, Bacteria, Cellular Structure & Function, Multicellular Life

19.1, 19.2, 19.4, 3.1, 3.2

4

HOMEOSTASIS & TRANSPORT

Big Idea: Life requires balance..

Cell Membrane Structure, Cellular Transport, Homeostasis, Positive & Negative Feedback Mechanisms

3.3-3.5, 24.2

5

CELLULAR ENERGETICS

Big Idea: Energy & matter cannot be created or destroyed only changed in form.

Energy, Plant Anatomy, Photosynthesis, Aerobic, Anaerobic Respiration, Cycles of Matter

4.1-4.6

6

DNA FORM & FUNCTION

Big Idea: DNA is the universal code for life.

DNA Structure, Replication & Function, Transcription, Translation, Mutations

8.1-8.7

7

CELL GROWTH

Big Idea: All cells must grow, develop, & divide.

Cell Cycle, Cell Differentiation, Cancer, Stem Cells, Multicellular Life

5.1-5.5

8

MEIOSIS & REPRODUCTION

Big Idea: Information is inherited & expressed.

Sexual Reproduction, Meiosis, Mutations, Nondisjunction, & Cloning

6.1-6.3, 6.6

9

GENETICS: MEIOSIS TO MENDEL

Big Idea: Information is inherited & expressed.

Traits, Genes, Alleles, Simple Patterns of Inheritance, Complex Patterns of Inheritance

6.4, 6.5, 7.1-7.5

10

BIOTECHNOLOGY

Big Idea: DNA is the universal code for life.

Genetic Engineering, DNA Fingerprinting, Gene Therapy & Other Manipulations

9.1-9.6

11

EVOLUTION

Big Idea: Change over time.

Darwin & Natural Selection, Microevolution, Macroevolution, Population Genetics

10.1-11.6

12

ECOLOGY

Big Idea: Life requires balance.

Food chains & webs, 10% rule, Bioaccumulation, Niches & Symbiosis, & Human Impact

13.1-13. 6, 14.1-14.5,

FINAL UNIT

This may include classification systems, biomes & biodiversity, history of life of Earth. It will be determined by amount of time & student interest.