IB Higher Level Biology Course Outline

Louisiana State University Laboratory School

www.uhighbiology.com

Instructor: M. Loupe

Course Description: *Ideal for students who plan to major in science, agriculture, or education.* The course is divided into two series of topics which are interconnected but can be taught in either order. Year one includes general concepts in cellular st ructure, cellular metabolism, cellular communication, and genetics. Year two includes general concepts in evolution, ecology, and the function of organisms. **Biology Laboratory.** Topics include biochemistry, enzymes, cell structures, osmosis, cellular respiration, photosynthesis, cell division, genetics, human systems, evolution, and ecology.

IB Requirements:

Core [80h]
Additional Higher Level [55h]
Practical Scheme of Work [60h]
Options [22h] x 2

YEAR ONE

UNIT I: INTRO TO EXPERIMENTAL SCIENCES

UNIT II: INTRO TO BIOCHEMISTRY

Topic 2 The chemistry of life
Topic 6 Nucleic Acids and Proteins

- 2.1 Chemical elements and water
- 2.2 Carbohydrates, lipids and proteins
- 6.5 Proteins
- 2.3 Enzymes
- 6.6 Enzymes

UNIT III: CELL STRUCTURE & FUNCTION

Topic 1 Cells

- 1.1 Cell theory
- 1.2 Prokaryotic cells
- 1.3 Eukaryotic cells
- 1.4 Membranes
- 1.5 Cell division

UNIT IV: CELL ENERGY

Topic 2 The chemistry of life
Topic 7 Cell respiration and photosynthesis

- 2.7 Cell respiration
- 7.1 Cell respiration
- 2.8 Photosynthesis
- 7.2 Photosynthesis

UNIT V: DNA

Topic 2 The chemistry of life
Topic 6 Nucleic Acids and Proteins

- 2.4 DNA structure
- 6.1 DNA structure
- 2.5 DNA replication
- 6.2 DNA replication
- 2.6 Transcription and translation
- 6.3 Transcription
- 6.4 Translation

UNIT VI: GENETICS

Topic 3 Genetics
Topic 8 Genetics

- 3.1 Chromosomes, genes, alleles and mutations
- 3.2 Meiosis
- 8.1 Meiosis
- 3.3 Theoretical genetics
- 3.4 Genetic engineering/biotechnology
- 8.2 Dihybrid crosses
- 8.3 Autosomal gene linkage
- 8.4 Polygenic inheritance

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YEAR TWO:

UNIT VII: ECOLOGY
Topic 4 Ecology and evolution
- 4.1 Communities and ecosystem
- 4.2 Populations
- 4.3 Evolution
- 4.4 Classification
- 4.5 Human impact

UNIT X: HUMAN PHYSIOLOGY I
Topic 5 Human health and physiology
- 5.1 Digestion
- 5.2 The transport system
- 5.5 Gas exchange

UNIT XI: HUMAN PHYSIOLOGY 2
Topic 11 Nerves, muscles and movement
- 11.1 Nerves
- 11.2 Muscles and movement

UNIT XII: REPRODUCTION & ENDOCRINOLOGY
Topic 9 Human Reproduction
- 9.1 Production of gametes/Meiosis
- 5.7 Reproduction
- 9.2 Fertilization and pregnancy

UNIT XIII: IMMUNITY & EXCRETION
Topic 10 Defense against infectious disease
- 10.1 Types of defense
- 5.3 Pathogens and disease
- 5.4 Defense against infectious disease

Topic 12 Excretion
- 5.6 Homeostasis and excretion
- 12.1 Excretion
- 12.2 The human kidney

UNIT XIV: PLANTS
Topic 13 Plant Science
- 13.1 Plant structure
- 13.2 Transport in angiospermophytes
- 13.3 Reproduction in flowering plants

UNIT VIII: EVOLUTION
Option D Evolution
Core (SL + HL)
- D.1 Origin of life on Earth
- D.2 Origin of species
- D.3 Evidence for evolution
- D.4 Human evolution

Extension (HL only)
- D.5 Neo-Darwinism
- D.6 The Hardy-Weinberg principle

UNIT IX: Applied Plant & Animal Science
Option F Applied plant and animal science
Core (SL + HL)
- F.1 Applied plant science
- F.2 Applied animal science
- F.3 Plant growth regulators
- F.4 Plant and animal breeding