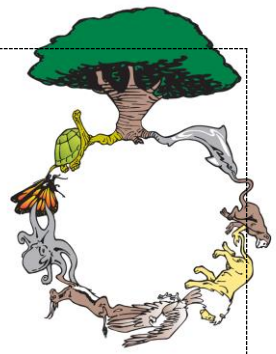


CARLE PLACE MIDDLE/HIGH SCHOOL SCIENCE DEPARTMENT

COURSE OUTLINE FOR HIGH SCHOOL HONORS LIVING ENVIRONMENT



The topics to be covered this year are listed below. The order may change.

Quarters 1 & 2

1. **Life Science Basics**

- a. Lab Safety
- b. Tools and techniques
- c. Microscope
- d. Measurement & Metric System
- e. Scientific method
- f. Graphing in science

2. **Organisms & Cells**

- a. Prokaryotes & Eukaryotes
- b. Unicellular & Multicellular Organization
- c. Life processes
- d. Metabolism
- e. Cells
 - i. The Cell Theory
 - ii. Structure of cells

3. **Maintenance of Homeostasis**

- a. Transport
 - i. Cell Transport
 1. Cell membrane structure & function
 2. Passive & Active transport
 - ii. Human Circulatory System
 1. Blood Components
 2. Blood vessels
 3. Types of circulation
 4. The Heart
 - a. Anatomy
 - b. Blood flow
 5. Disorders
 - iii. Plant transport
 1. Structures
 2. Properties of water
- b. Biochemistry
 - i. Organic & Inorganic compounds
 - ii. Acids & Bases
 - iii. Properties of water cont'd
 - iv. Macromolecules
 - v. Enzymes
- c. Heterotrophic Nutrition & Digestion
 - i. Nutrition
 1. Importance of nutrients

ii. The Human Digestive System

1. Types of digestion
2. Organs & functions
3. Disorders

d. Autotrophic Nutrition

- i. Chemosynthesis
- ii. Photosynthesis

e. Respiration

- i. Cellular Respiration
 1. Aerobic
 2. Anaerobic
- ii. Human Respiratory System
 1. Organs & airflow
 2. Gas exchange
 3. Disorders

f. Excretion

- i. Products of excretion
- ii. Excretory organs
- iii. Disorders

g. Immune System

- i. Blood typing
- ii. Infectious Disease
- iii. Disorders

h. Locomotion (time dependent)

- i. Skeletal System
- ii. Muscular System
 1. Types of muscle
 2. Muscle contraction

Quarters 3 & 4

Maintenance of Homeostasis Cont'd

- i. Regulation
 - i. Cell Communication
 - ii. Feedback Mechanisms
 - iii. Nervous system
 - 1. Divisions of the nervous system
 - 2. Impulse and Reflexes
 - a. Action potential propagation
 - iv. Endocrine System
 - 1. Glands & Hormones
 - 2. Disorders
 - v. Plant Regulation
 - 1. Guard Cells
 - 2. Hormones
- J. Reproduction and Development
 - i. Cell growth & Division
 - 1. Mitosis and Asexual Reproduction
 - 2. Gametogenesis/ Meiosis and Sexual Reproduction
 - ii. Human Reproduction
 - 1. Male & Female Systems
 - 2. Internal and External Fertilization & Development

4. Genetics

- a. Patterns of Heredity
 - i. Fundamentals of heredity
- b. Mendelian Genetics
 - i. Laws of dominance, segregation & independent assortment
 - ii. Test crosses
 - iii. Incomplete dominance
 - iv. Pedigrees
- c. Modern Genetics
 - i. Human Heredity
 - ii. Sex linkage
 - iii. DNA – The Material of Heredity
 - iv. Replication, transcription & translation
- d. Applied Genetics
 - i. Mutations
 - ii. Human Genetic Disorders
 - iii. Biotechnology
 - a. Gel electrophoresis & polymerase chain reaction
 - b. Genetic Engineering
 - c. Cloning

5. Evolution

- a. Theories of Evolution
 - i. Heterotrophic Hypothesis
 - ii. Natural Selection
- b. Evidence of Evolution
- c. Population Genetics
- d. Taxonomy
 - i. Finding order in Diversity
 - ii. Cladograms
 - iii. Dichotomous Keys

6. Ecology

- a. Ecosystems
- b. Nutritional & Symbiotic Relationships
- c. Land Biomes
- d. Material Cycles
- e. Succession
- f. Human Impact on Biodiversity
 - i. Importance of Biodiversity
 - ii. Threats to Biodiversity
 - iii. Human Population Growth
 - iv. Renewable & Nonrenewable Resources
 - v. Conservation Practices