General Syllabus for Biology 1 Science Conneaut School District

Course Description and Topics Covered:
This course will introduce the following subject matter to students: characteristics of life; scientific method; structure and function of the cell; cell growth, mitosis, specialization and meiosis; genetics, both molecular (DNA & RNA), and Mendelian (Punnet squares & patterns of inheritance); evolution; Taxonomy and introduction to the six kingdoms. This course is intended to prepare students for Biology 2, Anatomy & Physiology, and Microbiology.

Text Information: Miller & Levine Biology ©2010

Online Text Book: www.biology.com

Chapter 1 The Science of Biology (4 days @ 90 minutes/day)

- **Big Idea: Organisms share common characteristics of life.**

Chapter 2 The Chemistry of Life (10 days @ 90 minutes/day)

- **Big Idea: Life emerges due to the chemical organization of matter into cells.**

Chapter 7 Cell Structure and Function (10 days @ 90 minutes/day)

- **Big Idea: Cells have organized structures and systems necessary to support chemical reactions needed to maintain the living condition.**
- **Big Idea: Structure is related to function at all biological levels of organization.**
- **Big Idea: Through a variety of mechanisms organisms seek to maintain a biological balance between their internal and external environments.**

Chapter 8 Photosynthesis & Chapter 9 Cellular Respiration and fermentation (10 days @ 90 minutes/day)

- **Big Idea: Organisms obtain and use energy to carry out their life processes.**

Chapter 10 Cell Growth and Division (8 days @ 90 minutes/day)

- **Big Idea: New cells arise from the division of pre-existing cells.**
- **Big Idea: Eukaryotic cells can differentiate and organize making it possible for multicellularity.**

Chapter 12 DNA & Chapter 13 RNA and Protein Synthesis (12 days @ 90 minutes/day)

- **Big Idea: DNA segments contain information for the production of proteins necessary for growth and function of cells.**

Chapter 11 Introduction to Genetics & Chapter 14 Human Heredity (15 days @ 90 minutes/day)

- **Big Idea: Hereditary information in genes is inherited and expressed.**

Chapter 16 Darwin's Theory of Evolution (10 days @ 90 minutes/day)

- **Big Idea: Evolution is the result of many random processes selecting for the survival and reproduction of a population.**

Chapter 18 Classification (8 days @ 90 minutes/day)

- **Big Idea: Structure is related to function at all biological levels of organization.**
- **Big Idea: Through a variety of mechanisms organisms seek to maintain a biological balance between their internal and external environments.**

Preparation for Final Project/Exam and Final Exam/Presentation (3 days @ 90 minutes/day)

**indicated timeframes do not anticipate time lost to PSSA testing*

Instruction:

- Lecture
- Power point presentations
- Streaming Media
- Demonstrations
- Student inquiry labs/Guided labs
- Videos
- CD-ROM instruction
- Cooperative learning

Evaluation:

- Success Tracker (online testing and remediation)
- Projects/independent research (power point presentation, research paper)
- Lab activities with writing component
- Assessments:
    - Formative: informal teacher observation and feedback
    - Benchmark: tests and quizzes
    - Summative: PSSA, Keystone Exams

Parent/Student Resources:

- Online Textbook with audio capabilities
- Success Tracker (online assessment tool)
- Edline

Standards Assessed:

3.1.B.A Organisms and Cells

.1 Common Characteristics of Life
.2 Energy Flow
.3 Life Cycles
.4 Cell Cycles
.5 Form and Function
.6 Organization
.7 Molecular Basis of Life
.8 Unifying Themes
.9 Science as Inquiry

3.1.B.B Genetics

.1 Heredity
.2 Reproduction
.3 Molecular Basis of Life
.4 Biotechnology
.5 Unifying Themes
.6 Science as Inquiry

3.1.B.C Evolution

.1 Natural Selection
.2 Adaptation
.3 Unifying Themes
.4 Science as Inquiry

Assessment Anchors Addressed: (The Nature of Science and Biological Sciences)

S11.A.1.1 Reasoning and Analysis

.1 Analyze and explain the nature of science in the search for understanding the natural world and its connection to technological systems.

.2 Identify and analyze the scientific or technological challenges of societal issues; propose possible solutions and discuss implications.

.3 Describe and interpret patterns of change in natural and human-made systems.

S11.A.2 Processes, Procedures, and Tools of Scientific Investigations

.1 Apply knowledge of scientific investigation or technological design to develop or critique aspects of the experimental or design process.

.2 Evaluate appropriate technologies for a specific purpose, or describe the information the instrument can provide.

S11.A.3 Systems, Models, and Patterns

.1 Analyze the parts of a simple system, their roles, and their relationships to the system as a whole.

.2 Compare observations of the real world to observations of a constructed model.

.3 Compare and analyze repeated processes or recurring elements in patterns.

S11.B.1 Structure and Function of Organisms

.1 Explain structure and function at multiple levels of organization.

S11.B.2 Continuity of Life

.1 Explain the mechanisms of the theory of evolution.

.2 Describe how genetic information is inherited and expressed.

Essential Vocabulary

atom, molecule, organelle, cell, tissue, organ, organ system, organism, species, population, community, ecosystem, prokaryotic, eukaryotic, unicellular, multicellular, autotrophic, heterotrophic, food chain, food web, sexual reproduction, asexual reproduction, carbohydrate, protein, lipid, nucleic acid, enzyme, adenosine triphosphate (ATP), homeostasis, photosynthesis, cellular respiration, glycolysis, metabolism, deoxyribonucleic acid (DNA), ribonucleic acid (RNA), natural selection, microevolution, macroevolution, cytoplasm, protoplasm, microscopic, macroscopic, phospholipid bilayer, passive transport, active transport, osmosis, diffusion, concentration gradient, endocytosis, exocytosis, solute, solvent, replication, transcription, translation, monomer, polymer, heredity, gene, genome, allele, chromosome, chromatid, centromere, homologous, heterozygous, homozygous, dominant, recessive, codominance, incomplete dominance, sex-linkage, sex-influenced traits, multiple alleles, genotype, phenotype, Punnett square, mitosis, meiosis, somatic cell, sex cell, gamete, genetic recombination, mutation, speciation, adaptation, cell cycle, biotechnology, inquiry, equilibrium, organic, inorganic