PETERS TOWNSHIP HIGH SCHOOL
COURSE SYLLABUS: BIOLOGY ACADEMIC

Course Overview and Essential Skills

Over the course of this year, students will be introduced to the many important topics in the world of biology. Topics covered include: the properties needed by all living things in order to survive, the wonders of the cell and its function, genetics and evolution. The class will be mixture of both direct instruction as well as lab based activities. During this year students will not only learn many important topics in biology that will prepare them for the Keystone Biology exam, but also develop important study habits and skills that will be important beyond this class.

Along with taking Biology, students will take the **Keystone Biology Exam** in May, a high stakes standardized test issued by the state which is required for graduation. It is imperative that you take this exam seriously, and begin preparation from day one this school year. Students not scoring at least proficient on the keystone exam will be required to take a semester remediation course the year after testing, followed by a Keystone Exam re-take in December and/or May.

Course Textbook and Required Materials

- Textbook: Starr, Evers, & Starr. (2018). Biology: Concepts and Applications, 10th edition. Boston: Cengage Learning
- Online Textbook/Supplemental Website: Cengage MindTap Biology for Starr, Evers, Starr's Biology: Concepts and Applications. login.cengage.com
- Required Materials: 3 ringed binder/dividers, notebook, pen/pencil, highlighter, colored pencils, & calculator.

Course Outline of Material Covered:

Unit or Topic	Concepts/Skills/Resources	Timeframe*
Unit 1: Basic Biology and Biochemistry Chapter 1 – The Science of Biology Chapter 2 – Life's Chemical Basis Chapter 3 – Molecules of Life	Concepts: Scientific Method, Characteristics of Life, Biochemistry, Properties of Water Labs: Scientific Method Lab, pH Lab,	28 days Aug –Oct
Unit 2: Cellular Structure, Function, & Transport Chapter 4 – Cell Structure & Function Chapter 5 – Cell Transport, Energy, & Enzymes	Concepts: Cell Theory, Prokaryotic vs. Eukaryotic, Microscopes, Cell Structure (organelles), Cell Transport, Energy, and Enzymes Labs: Microscope Lab, Diffusion & Osmosis Lab, Enzyme Lab	27 days Oct –Nov

Unit 3: Bioenergetics Chapter 6 - Photosynthesis Chapter 7 – Cellular Respiration	Concepts: Energy of Life & ATP, Photosynthesis, Chloroplast Structure, Cellular Respiration, Mitochondria Structure, Fermentation Labs: Photosynthesis Lab, Cellular Respiration Lab	19 days Nov - Dec
Unit 4: Cellular Reproduction & Genetics Chapter 11 - Cell Division and Reproduction Chapter 12 – Meiosis and Sexual Reproduction Chapter 13 – Patterns of Inheritance Chapter 14 – Human Inheritance	Concepts: Cell Cycle, Mitosis, Cancer, Meiosis, Karyotypes Chromosomal Abnormalities, History of Mendel, Patterns of Inheritance, Probability, Genetic Disorders Labs: Cell Cycle & Mitosis Inquiry Lab, Meiosis Inquiry Lab. Blood Typing Lab	37 days Jan - Feb
Unit 5: Molecular Biology of the Gene Chapter 8 – DNA Structure and Function Chapter 9 – From DNA to Protein	Concepts: History of Molecular Biology, DNA Replication, Protein Synthesis, Mutations, Cloning. Genetic Engineering, GMO's. Labs: DNA Modeling Lab, Protein Synthesis and Mutations Lab, Paper Plasmids Activity	15 days March
Unit 6: Evolution and Continuity of Life Chapter 16 – Evidence of Evolution Chapter 17 – Process of Evolution	Concepts: History of the Theory of Natural Selection, The Process of Natural Selection, Evidence for Evolution, Types of Selection, Types of Isolation Labs: Population Evolution Lab, Evolving STEM Lab	19 days March – April
Unit 7: Ecology Chapter 40 – Populations Chapter 41 – Communities Chapter 42 – Ecosystems Chapter 43 – The Biosphere Chapter 44 – Human Impact	Concepts: Levels of Ecology, Biomes, Energy Flow (Food Web/Food Chains), Niches, Community Interactions, Carrying Capacity, Human Impact.	13 days May
Keystone Review	Concepts: Review of all concepts and skills for preparation of the Keystone Exam.	12 days May
Unit 8: Biological Classification Chapter 23 – Invertebrate Classification Chapter 24 – Vertebrate Classification	Concepts: Taxonomy, Invertebrate and Vertebrate Hierarchy, Homologous Structures, Vertebrate and Invertebrate Anatomy Labs: Leopard Frog Dissection	10 days May - June

****Depending on the needs of the class or changes in the school year, the course outline is subject to change.***