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Biology

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Course Description

Biology is the study of life. This course introduces students to the study of cells, genetics, ecology and the 5 Kingdoms of Classification: Animalia, Plantae, Monera, Protista, and Fungi. Much time is spent with the Kingdom Animalia, doing a wide range of dissections with each group studied.

Course Objectives

- Students will know the six unifying themes of biology.
 - Students will know and apply the six characteristics that all living things share.
 - Students will know and apply the concepts, principles and processes of scientific inquiry.
 - Students will know and apply concepts that explain how living things function, adapt and change.
- Students will know and apply concepts that describe how living things interact with each other and with their environment.
 - Students will know and apply concepts from Mendelian genetics.
 - Students will know and apply concepts genetics in terms of DNA, RNA, and protein synthesis.
 - Students will demonstrate knowledge of bacteria and viruses and tell how they are different.
- Students will demonstrate knowledge of several species of the Kingdom Animalia and distinguish between them on the basis of their body systems.

Course Outline

- The Science of Life
- Themes of Biology
- The World of Biology
 - Scientific Methods
- Microscopy and Measurement
- Structure and Function of the Cell
 - Introduction to the Cell
 - Parts of a Eukaryotic Cell
 - Multicellular Organization
 - Homeostasis and Transport
 - Passive Transport
 - Active Transport
 - Cell Reproduction
 - Chromosomes
 - Cell Division
 - Meiosis
 - Fundamentals of Genetics
 - Mendel's Legacy
 - Genetic Crosses
- Nucleic Acids and Protein Synthesis
 - DNA
 - RNA
 - Protein Synthesis
 - Human Genetics
- Study of inheritance
 - Genetic Disorders
 - Ecology
- Species, Population, and Communities
 - Ecosystems
- Environmental Issues

- Bacteria and Viruses
- Specialization within the ecosystem
 - Structures of each
 - Bacteria and Humans
 - Viruses and Humans
 - Protists and Fungi
 - Structure and Functions
- Benefits and Disadvantages
 - Plants
 - Importance of Plants
 - Vascular and Nonvascular
 - Structure and Function
 - Invertebrates
 - Sponges and Cnidarians
 - Mollusks and Annelids
 - Arthropods
- Insects-Grasshopper Dissection
 - Vertebrates
 - Fishes
 - Amphibians
 - Frog Dissection
 - Reptiles
 - Birds
 - Mammals
 - Rat Dissection

Teaching Methods

This class will be taught through lecture, laboratory, demonstrations, videos and computer software. The students have daily assignments and certain assignments set aside for group work.

There will be a project or lab that goes with each chapter for which the student will be required to participate. Some require a written paper, others require an oral presentation.

Assessment

- Daily assignments will be assessed on the basis of content. Each chapter there will be approximately as many points for daily assignments as there will be for the chapter test.
- There will be a lab for almost every chapter we cover. The students will be graded on the basis of lab technique and skill as well as a lab write up for each. During the last quarter we will mainly spend time doing dissections for the labs. During these labs the students will also be assessed in the form of a lab practical.
 - There are several vocabulary terms that the students encounter in this class so there will be periodic vocabulary quizzes for a grade.
- There will be a chapter test for most chapters covered. During the animal science portion, there will be two different units (vertebrates and invertebrates) for which there will be several sections in each unit. After each section the students will be given a large quiz, and upon the completion of the unit they will be given a unit test.
- There is a biologist of the month assigned each month for which the students have the option to do research. If the student chooses to do this assignment it will be graded as extra credit. The biologists chosen have all received world-wide recognition for some area that relates to the field biology.

Text

Biology, Miller & Levine, 2010.