

**Jefferson County High School
Biology II Syllabus**

A. Course: Biology II

B. Department: Science

C. Course Description: Biology II is primarily intended for students who have attained a grade of 85 or higher in Biology I and plan to attend college. The course will include a study of the anatomy and physiology of animals and plants. Emphasis will be placed on laboratory work, including many dissection activities.

D. Grade Term: Semester

E. Grading Scale

<u>Range</u>	<u>Regular</u>
93-100 A	4.0
85-92 B	3.0
75-84 C	2.0
70-74 D	1.0

F. Term Dates

- a. 1st 9 Weeks August 5, 2016 – October 7, 2016
- b. 2nd 9 Weeks October 8, 2016 – December 16, 2016
- c. 3rd 9 Weeks January 5, 2017 – March 15, 2017
- d. 4th 9 Weeks March 16, 2017 – May 25, 2017

G. Textbook(s): Glencoe Biology 2010

H. Other Resources

- a. Odysseyware

I. Major Assignments

- a. Lab Reports
- b. Dissections

J. Procedures for Parental Access to Instructional Materials

- a. Aspen Parent Portal
- b. Instructor's Website
- c. Email Instructor
- d. Parent Teacher Conference
 - a. There are two designated conference dates during the school year. Parents who would like to request additional meetings may make appointments for conferences with the teachers (during their planning periods), counselors, or a principal by telephoning the school office.

K. Field Trips

- a. Any schedule fieldtrip will have a definite educational purpose and will reflect careful planning. Signed permission forms will be obtained when an off campus trip is planned.

L. Standards & Objectives

	CLE	I can...
Cells		
1 Week	CLE 3216.1.1 Compare the characteristics of prokaryotic and eukaryotic cells.	I can compare the organization and function of prokaryotic and eukaryotic cells.
	CLE 3216.1.2 Describe how fundamental life processes depend on chemical reactions that occur in specialized cells.	I can relate the chemical processes that occur in specialized cell types to their biological significance.
	CLE 3216.1.3 Explain how materials move into and out of cells.	I can conduct an experiment or simulation to demonstrate the movement of molecules through diffusion, facilitated diffusion, and active transport.
	CLE 3216.1.4 Describe the enzyme-substrate relationship.	I can describe the composition and function of enzymes. I can analyze the rate of reactions in which variables such as temperature, pH, and substrate and enzyme concentration are manipulated.
	CLE 3216.1.5 Investigate how proteins regulate the internal environment of a cell through communication and transport.	I can develop a flow chart that tracks a protein molecule from transcription through export from the cell. I can describe the role of the ribosomes, endoplasmic reticulum, and Golgi apparatus in the production and packaging of proteins. Describe how carbohydrates, proteins, lipids, and nucleic acids function in the cell.
	CLE 3216.1.6 Describe the relationship between viruses and their host cells.	I can illustrate the interactions between a virus and a host cell.

Interdependence

1 Week	CLE 3216.2.1 Describe how the stability of an ecosystem is maintained.	I can analyze the ecological impact of a change in climate, human activity, introduction of non-native species, and changes in population size over time.
	CLE 3216.2.2 Investigate the major factors that influence population size and age distribution.	Investigate how fluctuations in population size in an ecosystem are determined by the relative rates of birth, death, immigration, and emigration.
	CLE 3216.2.3 Describe the varying degrees to which individual organisms are able to accommodate changes in the environment.	I can investigate how human changes to the environment have led populations to adapt, migrate, or become extinct.
	CLE 3216.2.4 Distinguish between the accommodation of individual organisms and the adaptation of a population to environmental change.	I can contrast accommodations of individual organisms with the adaptation of a species.

Flow of Matter and Energy

1 Week	CLE 3216.3.1 Describe the role of biotic and abiotic factors in the cycling of matter in the ecosystem.	I can describe how water, carbon, oxygen, and nitrogen cycle between the biotic and abiotic elements of the environment. I can calculate the amount of energy transfer through an ecosystem.
	CLE 3216.3.2 Explain how sunlight is captured by plant cells and converted into usable energy.	I can design an experiment to separate plant leaf pigments. I can develop a concept map or flow chart to compare the sequence of molecular events during photosynthesis and cellular respiration. I can sequence the steps involved in sugar production during photosynthesis.
	CLE 3216.3.3 Describe how mitochondria make stored chemical energy available to cells.	I can trace the breakdown of sugar molecules during cellular respiration.
	CLE 3216.3.4 Examine how macromolecules are synthesized from simple precursor molecules.	I can build models of macromolecules from simple precursors.
	CLE 3216.3.5 Analyze the role of ATP in the storage and release of cellular energy.	I can compare the amount of ATP produced during aerobic and anaerobic respiration.

Heredity

1 Week	<p>CLE 3216.4.1 Describe how mutation and sexual reproduction contribute to the amount of genetic variation in a population.</p>	<p>I can illustrate the movement of chromosomes and other cellular organelles involved in meiosis.</p> <p>I can provide a detailed explanation of how meiosis and fertilization result in new genetic combinations.</p>
	<p>CLE 3216.4.2 Describe the relationship between phenotype and genotype.</p>	<p>I can describe the relationship between genotype and phenotype.</p>
	<p>CLE 3216.4.3 Predict the probable outcome of genetic crosses based on Mendel's laws of segregation and independent assortment.</p>	<p>I can compare the expected outcome with the actual results of a cross in an organism such as a fruit fly or fast plant.</p>
	<p>CLE 3216.4.4 Describe the relationship among genes, the DNA code, production of protein molecules, and the characteristics of an organism.</p>	<p>I can apply the genetic coding rules to predict the sequence of amino acids from a sequence of codons in RNA.</p>
	<p>CLE 3216.4.5 Explain how the different shapes and properties of proteins are determined by the type, number, and sequence of amino acids.</p>	<p>I can develop a model to illustrate the stages of protein synthesis.</p> <p>I can recognize how various types of mutations affect gene expression and the sequence of amino acids in the encoded protein.</p> <p>I can distinguish among the characteristics of various structural levels found in protein molecules.</p>
	<p>CLE 3216.4.6 Explain how the genetic makeup of cells can be engineered.</p>	<p>I can describe the formation of recombinant DNA molecules.</p> <p>I can recognize that genetic engineering can be applied to develop novel biomedical and agricultural products.</p>

Biodiversity and Change

1 Week	CLE 3216.5.1 Identify factors that determine the frequency of an allele in the gene pool of a population.	<p>I can predict how variation within a population affects the survival of a species.</p> <p>I can recognize that natural selection acts on an organism's phenotype rather than its genotype.</p> <p>I can analyze population changes in terms of the Hardy-Weinberg principle.</p>
	CLE 3216.5.2 Determine how mutation, gene flow, and migration influence population structure.	<p>I can describe how reproductive and geographic isolation affect speciation.</p> <p>I can explain how amount of biodiversity is affected by habitat alteration.</p> <p>I can use fossil evidence, DNA structure, amino acid sequences, and other data sources to construct a cladogram that illustrates evolutionary relationships.</p>

Comparative Anatomy and Physiology

7 Weeks	CLE 3216.6.1 Investigate the unity and the diversity among living things.	<p>I can describe how the activities of major body systems help to maintain homeostasis.</p> <p>I can distinguish between various methods of sexual and asexual reproduction.</p>
	CLE 3216.6.2 Describe the events associated with reproduction from gamete production through birth	<p>I can create a model that illustrates stages of embryological development.</p> <p>I can develop a representation of the different germ layers and the tissue type into which they develop.</p>
	CLE 3216.6.3 Compare organ systems of representative animal phyla that: regulate gas exchange, process and distribute nutrients, remove wastes, transmit chemical and electrical information, and respond to environmental stimuli.	<p>I can describe how the nervous and endocrine systems coordinate various body functions.</p> <p>I can observe, model, manipulate, and/or dissect representative specimens of major animal groups.</p> <p>I can compare and contrast the function of the major organ systems found in representative animal species.</p>

Botany

6 Weeks	CLE 3216.7.1 Describe different plant types plants based on their anatomy and physiology.	I can employ a dichotomous key to identify plants based on their structural characteristics. I can distinguish between the following: vascular and nonvascular plants, spore and seed, gymnosperms and angiosperms, and monocots and dicots.
	CLE 3216.7.2 Investigate the relationship between form and function for the major plant structures.	I can describe the function of plant cellular organelles. I can investigate the significance of structural and physiological adaptations of plants as related to function.
	CLE 3216.7.3 Examine the anatomical and physiological differences between plants and their growth, reproduction, survival, and co-evolution.	I can describe co-evolution among various plant and animal species. I can investigate the significance of structural and physiological adaptations of plants as related to reproduction.
	CLE 3216.7.4 Describe the difference between plants and fungi.	I can compare and contrast spore and seed production.
	CLE 3216.7.5 Investigate the impact of plants on humans.	I can prepare a presentation about plants that are harmful or beneficial to humans.