

Biology (Year Long) Standard Division Document 2017-2018

First 9 weeks

1.1.1 Summarize the structure and function of organelles in eukaryotic cells (including the nucleus, plasma membrane, cell wall, mitochondria, vacuoles, chloroplast and ribosomes) and ways that these organelles interact with each other to perform the function of the cell.

1.1.2 Compare prokaryotic and eukaryotic cells in terms of their general structures (plasma membrane and genetic material) and degree of complexity.

1.2.1 Explain how homeostasis is maintained in the cell and within an organism in various environments (including temperature and pH).

1.2.3 Explain how specific cell adaptations help cells survive in particular environments (focus on unicellular organisms).

4.1.1 Compare the structures and functions of the major biological molecules (carbohydrates, proteins, lipids and nucleic acids) as related to the survival of living organisms.

4.1.3 Explain how enzymes act as catalysts for biological reactions.

3.1.1 Explain the double-stranded, complementary nature of DNA as related to its function in the cell.

4.2.1 Analyze photosynthesis and cellular respiration in terms of how energy is stored, released and transferred within and between these systems.

Second 9 weeks

4.2.2 Explain ways that organisms use released energy for maintaining homeostasis (active transport).

1.1.3 Explain how instructions in DNA lead to cell differentiation and result in cells specialized to perform specific functions in multicellular organisms

1.2.2 Analyze how cells grow and reproduce in terms of interphase, mitosis and cytokinesis.

3.1.2 Explain how DNA and RNA code for proteins and determine traits.

	<p>3.1.3 Explain how mutations in DNA that result from interactions with the environment (i.e. radiation and chemicals) or new combinations in existing genes lead to change in function and phenotype.</p>
	<p>3.2.1 Explain the role of meiosis in sexual reproduction and genetic variation.</p>
	<p>3.2.2 Predict offspring ratios based on a variety of inheritance patterns (including dominance, co-dominance, incomplete dominance, multiple alleles, and sex-linked traits).</p>
	<p>3.2.3 Explain How the environment can influence the expression of genetic traits.</p>
<p>Third 9 weeks</p>	<p>4.1.2 Summarize the relationship among DNA, proteins and amino acids in carrying out the work of cells and how this is similar in all organisms.</p>
	<p>3.3.1 Interpret how DNA is used for comparison and identification of organisms.</p>
	<p>3.3.2 Summarize how transgenic organisms are engineered to benefit society.</p>
	<p>3.3.3 Evaluate some of the ethical issues surrounding the use of DNA technology (including cloning, genetically modified organisms, stem cell research and Human Genome Project).</p>
	<p>3.4.2 Explain how natural selection influences the change in species over time.</p>
	<p>3.4.1 Explain how fossil, biochemical and anatomical evidence support the theory of evolution.</p>
	<p>2.1.2 Analyze the survival and reproductive success of organisms in terms of behavioral, structural and reproductive adaptations.</p>
	<p>2.1.3 Explain various ways organisms interact with each other (including predation, competition, parasitism, mutualism) and with their environments resulting in stability within ecosystems.</p>
	<p>2.2.1 Infer how human activities (including population growth, pollution, global warming, burning of fossil fuels, habitat destruction and introduction of nonnative species) may impact the environment.</p>

Fourth 9 weeks

2.2.2 Explain how the use, protection and conservation of natural resources by humans impact the environment from one generation to the next.

2.1.4 Explain why ecosystems can be relatively stable over hundreds or thousands of years, even though populations may fluctuate (emphasizing availability of food, availability of shelter, number of predators and disease).

3.4.3 Explain how various disease agents (bacteria, viruses, chemicals) can influence natural selection.

3.5.1 Explain the historical development and changing nature of classification systems.

3.5.2 Analyze the classification of organisms according to their evolutionary relationships (including dichotomous keys and phylogenetic trees).

2.1.1 Analyze the flow of energy and cycling of matter (water, carbon, nitrogen and oxygen) through ecosystems relating the significance of each to maintaining the health and sustainability of an ecosystem.