

**Arizona High School Science  
Curriculum Standards, 2005**

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<b>Life Science</b>	<b>Boardworks High School Biology Presentations</b>
<b>Concept 1: The Cell</b>	
PO 1. Describe the role of energy in cellular growth, development, and repair.	Aerobic Respiration
PO 2. Compare the form and function of prokaryotic and eukaryotic cells and their cellular components.	Eukaryotic Cells Prokaryotic Cells Organelles
PO 3. Explain the importance of water to cells.	Water
PO 4. Analyze mechanisms of transport of materials (e.g., water, ions, macromolecules) into and out of cells:	
passive transport	Diffusion Osmosis
active transport	Active Transport
PO 5. Describe the purposes and processes of cellular reproduction.	Cell Differentiation Mitosis The Stages of Mitosis Asexual Reproduction
<b>Concept 2: Molecular Basis of Heredity</b>	
PO 1. Analyze the relationships among nucleic acids (DNA, RNA), genes, and chromosomes.	Nucleic Acids DNA
PO 2. Describe the molecular basis of heredity, in viruses and living things, including DNA replication and protein synthesis.	DNA Replication 1 DNA Replication 2 Controlling Protein Synthesis Protein Synthesis Transcription and Translation Asexual Reproduction
PO 3. Explain how genotypic variation occurs and results in phenotypic diversity.	Genetic Variation Genetic Mutations Meiosis The Stages of Meiosis Genes and Alleles Patterns of Inheritance Population Genetics

PO 4. Describe how meiosis and fertilization maintain genetic variation.	Meiosis The Stages of Meiosis
<b>Concept 3: Interdependence of Organisms</b>	
PO 1. Identify the relationships among organisms within populations, communities, ecosystems, and biomes.	Decomposers Describing Populations Ecosystems Ecosystems and Succession Food Chains Food Webs Host-Parasite Relationships Predator-Prey Relationships Introduction to Biodiversity
PO 2. Describe how organisms are influenced by a particular combination of biotic (living) and abiotic (nonliving) factors in an environment.	Ecosystems
PO 3. Assess how the size and the rate of growth of a population are determined by birth rate, death rate, immigration, emigration, and carrying capacity of the environment.	Describing Populations
<b>Concept 4: Biological Evolution</b>	
PO 1. Identify the following components of natural selection, which can lead to speciation:	
• potential for a species to increase its numbers	
• genetic variability and inheritance of offspring due to mutation and recombination of genes	The Process of Evolution
• finite supply of resources required for life	The Process of Evolution
• selection by the environment of those offspring better able to survive and produce offspring	The Process of Evolution Extinction
PO 2. Explain how genotypic and phenotypic variation can result in adaptations that influence an organism's success in an environment.	Evolution The Process of Evolution Extinction
PO 3. Describe how the continuing operation of natural selection underlies a population's ability to adapt to changes in the environment and leads to biodiversity and the origin of new species.	Evolution The Process of Evolution Extinction
PO 4. Predict how a change in an environmental factor (e.g., rainfall, habitat loss, non-native species) can affect the number and diversity of species in an ecosystem.	Extinction Loss of Diversity Population Genetics

PO 5. Analyze how patterns in the fossil record, nuclear chemistry, geology, molecular biology, and geographical distribution give support to the theory of organic evolution through natural selection over billions of years and the resulting present day biodiversity.	Fossil Record Evolution Population Genetics
PO 6. Analyze, using a biological classification system (i.e., cladistics, phylogeny, morphology, DNA analysis), the degree of relatedness among various species.	–
<b>Concept 5: Matter, Energy, and Organization in Living Systems (Including Human Systems)</b>	
PO 1. Compare the processes of photosynthesis and cellular respiration in terms of energy flow, reactants, and products.	Photosynthesis 1 Photosynthesis 2 Aerobic Respiration
PO 2. Describe the role of organic and inorganic chemicals (e.g., carbohydrates, proteins, lipids, nucleic acids, water, ATP) important to living things.	Aerobic Respiration Lipids Proteins Nucleic Acids Monosaccharides Polysaccharides Water
PO 3. Diagram the following biogeochemical cycles in an ecosystem:	
• water	Water Cycle
• carbon	Carbon Cycle
• nitrogen	Nitrogen Cycle
PO 4. Diagram the energy flow in an ecosystem through a food chain.	Energy Transfer in Food Chains Energy Loss in Food Chains
PO 5. Describe the levels of organization of living things from cells, through tissues, organs, organ systems, organisms, populations, and communities to ecosystems.	Cells to Organisms Describing Populations