

**Missouri Science Standard VII & VIII
Curriculum Standards**

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Living Systems & Ecology	Boardworks High School Biology Presentations
Standard VII: Living Systems	
A. Structure/Function/Characteristics	
1. Cells are the fundamental structural and functional units of all living organisms and take highly varied forms in different plants, animals and microorganisms.	Cell Differentiation Cell Theory Eukaryotic Cells Prokaryotic Cells
2. Cells have distinct and separate structures that perform and monitor processes essential for the survival of the cell and/or organism, such as chemical synthesis, energy conversion, material transport, and cell replication.	Organelles Controlling Protein Synthesis Protein Synthesis Proteins DNA DNA Replication 1 DNA Replication 2 Diffusion Active Transport Osmosis Aerobic Respiration Photosynthesis 1 Photosynthesis 2 Meiosis Mitosis The Stages of Meiosis The Stages of Mitosis
3. DNA indirectly controls what cells do and when they do it by conveying encoded information directing the cell's synthesis of protein molecules.	Controlling Protein synthesis DNA Protein Synthesis Proteins Transcription and Translation
4. Organisms are classified into a hierarchy of groups and subgroups, based on their structural similarities and reflecting as much as possible their evolutionary relationships.	Classification
B. Life Processes	

1. Cells carry out chemical transformations that allow conversion of energy from one form to another, the breakdown of molecules into smaller units, and the building of larger molecules from smaller ones.	Photosynthesis 1 Photosynthesis 2 Aerobic Respiration Anaerobic Respiration Nucleic Acids Proteins Protein Synthesis Monosaccharides Digestion Enzymes Polysaccharides
2. Photosynthesis and cellular respiration are complementary processes.	Photosynthesis 1 Photosynthesis 2 Aerobic Respiration The Respiratory System
3. Optimum conditions are maintained in an organism as a result of special functions performed at the cellular level.	Glucoregulation Homeostasis Thermoregulation Body Temperature
C. Diversity	
1. Similarities in DNA and protein structure can be used to classify and determine degrees of kinship among organisms.	Evolution Understanding Genomes
2. Variations of organisms within a species and diversity among species increase the likelihood that at least some organisms will survive in the face of large changes in the environment.	The Process of Evolution Extinction Evolution
D. Reproduction/Heredity	
1. Heredity/genetic information is contained in molecules of DNA that consist of various combinations of four different subunits that encode this information.	DNA Nucleic Acids
2. The pattern of inheritance for many traits can be predicted by using the principles of Mendelian genetics.	Gregor Mendel Patterns of Inheritance
3. Coding error in DNA synthesis (mutation) can occur randomly during replication and can also be caused by heat, radiation, and certain chemicals.	Genetic Mutations DNA Replication 1
4. In asexual reproduction of unicellular organisms (and mitosis in multicellular organisms), DNA of parent cells replicates to form identical chromosomes and genes as the cell divides into two identical offspring cells.	Asexual Reproduction Mitosis The Stages of Mitosis

5. Embryological development in plants and animals involves a series of orderly changes in cell division and differentiation.	Development Cell Differentiation
E. Adaptation/Evolution	
1. Evidence for the nature and rates of evolution can be found in anatomical and molecular characteristics of living organisms and in the fossil record.	Fossil Record Evolution Darwin
2. The process of natural selection provides that some heritable variations that arise from mutation and recombination give individuals within a species some advantage over others for survival.	The Process of Evolution Evolution Genetic Variation Genetic Mutation Meiosis
3. Evolution does not proceed at the same rate in all organisms; nor does it progress in any set direction.	Evolution
VIII: Ecology	
A. Interactions	
1. No two species occupy the same niche in an ecosystem so that different species can coexist and help maintain the stability of that system.	—
2. Human decisions concerning the use of resources can alter the stability and biodiversity of ecosystems.	Human Impact on the Environment Loss of Diversity Air Pollution Water Pollution Climate Change The Impact of Mining The Impact of Using CFCs Over-fishing Extinction Fossil Fuels
3. Increased demand for natural resources require global cooperation and long-term planning to ensure the resource needs of successive generations will be met.	Climate Change
B. Changes	
1. Ecosystems are interconnected by biological, chemical, and physical processes so that changes in one ecosystem can have local or global consequences.	Food Webs Extinction Loss of Diversity
2. Overpopulation in an ecosystem can lead to depletion of resources and elimination of a species.	Extinction Loss of Diversity Ecosystems