

**New Jersey High School Science
Curriculum Standards Mapping**

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LIFE SCIENCE	Boardworks High School Biology Presentations
A. Organization and Development: Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.	
5.3.12 A.1 Cells are made of complex molecules that consist mostly of a few elements. Each class of molecules has its own building blocks and specific functions.	Lipids Monosaccharides Nucleic Acids Polysaccharides Proteins
5.3.12.A.2 Cellular processes are carried out by many different types of molecules, mostly by the group of proteins known as enzymes.	Enzymes Enzyme Shape Lipids Monosaccharides Nucleic Acids Polysaccharides Proteins
<i>5.3.12.A.3 Cellular function is maintained through the regulation of cellular processes in response to internal and external environmental conditions.</i>	-
5.3.12.A.4 Cells divide through the process of mitosis, resulting in daughter cells that have the same genetic composition as the original cell.	Mitosis The Stages of Mitosis
5.3.12.A.5 Cell differentiation is regulated through the expression of different genes during the development of complex multicellular organisms.	Cell Differentiation
5.3.12.A.6 There is a relationship between the organization of cells into tissues and the organization of tissues into organs. The structures and functions of organs determine their relationships within body systems of an organism.	Cells to Organisms
B. Matter and Energy Transformations: Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.	

5.3.12.B.1 As matter cycles and energy flows through different levels of organization within living systems (cells, organs, organisms, communities), and between living systems and the physical environment, chemical elements are recombined into different products.	Carbon Cycle Decomposers Energy Loss in Food Chains Energy Transfer in Food Chains Food Chains Nitrogen Cycle Recycling Nutrients Water Cycle
5.3.12.B.2 Each recombination of matter and energy results in storage and dissipation of energy into the environment as heat.	Energy Loss in Food Chains Energy Transfer in Food Chains
5.3.12.B.3 Continual input of energy from sunlight keeps matter and energy flowing through ecosystems.	Food Chains
5.3.12.B.4 Plants have the capability to take energy from light to form sugar molecules containing carbon, hydrogen, and oxygen.	Photosynthesis 1 Photosynthesis 2
5.3.12.B.5 In both plant and animal cells, sugar is a source of energy and can be used to make other carbon-containing (organic) molecules.	Aerobic Respiration
5.3.12.B.6 All organisms must break the high-energy chemical bonds in food molecules during cellular respiration to obtain the energy needed for life processes.	Aerobic Respiration Anaerobic Respiration
C. Interdependence: All animals and most plants depend on both other organisms and their environment to meet their basic needs.	
5.3.12.C.1 Biological communities in ecosystems are based on stable interrelationships and interdependence of organisms.	Decomposers Ecosystems Food Chains Food Webs Host-Parasite Relationships Predator-Prey Relationships
5.3.12.C.2 Stability in an ecosystem can be disrupted by natural or human interactions.	Extinction Loss of Diversity
D. Heredity and Reproduction: Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.	
5.3.12.D.1 Genes are segments of DNA molecules located in the chromosome of each cell. DNA molecules contain information that determines a sequence of amino acids, which result in specific proteins.	Controlling Protein Synthesis DNA Nucleic Acids Protein Synthesis Transcription and Translation

5.3.12.D.2 Inserting, deleting, or substituting DNA segments can alter the genetic code. An altered gene may be passed on to every cell that develops from it. The resulting features may help, harm, or have little or no effect on the offspring's success in its environment.	DNA Replication 2 Genetic Mutations Inherited Diseases
5.3.12.D.3 Sorting and recombination of genes in sexual reproduction result in a great variety of possible gene combinations in the offspring of any two parents.	Genetic Variation Meiosis
E. Evolution and Diversity: Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.	
5.3.12.E.1 New traits may result from new combinations of existing genes or from mutations of genes in reproductive cells within a population.	Genetic Variation Inherited Diseases
5.3.12.E.2 <i>Molecular evidence (e.g., DNA, protein structures, etc.) substantiates the anatomical evidence for evolution and provides additional detail about the sequence in which various lines of descent branched.</i>	–
5.3.12.E.3 The principles of evolution (including natural selection and common descent) provide a scientific explanation for the history of life on Earth as evidenced in the fossil record and in the similarities that exist within the diversity of existing organisms.	Darwin Evolution Fossil Record The Process of Evolution
5.3.12.E.4 Evolution occurs as a result of a combination of the following factors: <ul style="list-style-type: none"> • Ability of a species to reproduce • Genetic variability of offspring due to mutation and recombination of genes • Finite supply of the resources required for life • Natural selection, due to environmental pressure, of those organisms better able to survive and leave offspring 	Darwin Evolution The Process of Evolution