

**North Carolina High School Science
Objectives Mapping**

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BIOLOGY	Boardworks High School Biology Presentations
Competency Goal 2: The learner will develop an understanding of the physical, chemical and cellular basis of life.	
2.01 Compare and contrast the structure and functions of the following organic molecules:	
Carbohydrates	Digestion Monosaccharides Polysaccharides
Proteins	Digestion Protein Synthesis Proteins
Lipids	Digestion Lipids
Nucleic acids	Digestion DNA Nucleic Acids
2.02 Investigate and describe the structure and functions of cells including:	
Cell organelles	Eukaryotic Cells Organelles Prokaryotic Cells Specialized Plant Cell
Cell specialization	Cell Differentiation Specialized Plant Cell
Communication among cells within an organism	Eukaryotic Cells Hormones
2.03 Investigate and analyze the cell as a living system including:	
Maintenance of homeostasis	Homeostasis
Movement of materials into and out of cells	Active Transport Diffusion Eukaryotic Cells Organelles Osmosis Prokaryotic Cells

Energy use and release in biochemical reactions	Aerobic Respiration
2.04 Investigate and describe the structure and function of enzymes and explain their importance in biological systems.	Enzymes Enzyme Shape
2.05 Investigate and analyze the bioenergetic reactions:	
Aerobic Respiration	Aerobic Respiration
Anaerobic Respiration	Anaerobic Respiration
Photosynthesis	Photosynthesis1 Photosynthesis2
Competency Goal 3: The learner will develop an understanding of the continuity of life and the changes of organisms over time.	
3.01 Analyze the molecular basis of heredity including:	
DNA replication	DNA DNA Replication 1
Protein synthesis (transcription, translation)	Protein Synthesis Transcription and Translation
Gene regulation	Controlling Protein Synthesis
3.02 Compare and contrast the characteristics of asexual and sexual reproduction.	Asexual Reproduction Genetic Variation Meiosis The Stages of Meiosis
3.03 Interpret and predict patterns of inheritance.	
Dominant, recessive and intermediate traits	Genes and Alleles Gregor Mendel Inherited Diseases Incomplete Dominance and Codominance
Multiple alleles	Genes and Alleles Gregor Mendel
<i>Polygenic inheritance</i>	–
Sex-linked traits	Boy or Girl
Independent assortment	Meiosis The Stages of Meiosis
Test cross	Genes and Alleles Gregor Mendel
<i>Pedigrees</i>	–
Punnett squares	Genes and Alleles

3.04 Assess the impact of advances in genomics on individuals and society.	
Human genome project	Understanding Genomes
Applications of biotechnology	Genetic Engineering Genetic Engineering for Health Care GM Organisms
3.05 Examine the development of the theory of evolution by natural selection including:	
Development of the theory	Darwin Fossil Record
The origin and history of life	Evolution Fossil Record
Fossil and biochemical evidence	Fossil Record
Mechanisms of evolution	Evolution The Process of Evolution
Applications (pesticide and antibiotic resistance)	Superbugs
Competency Goal 4: The learner will develop an understanding of the unity and diversity of life.	
4.01 Analyze the classification of organisms according to their evolutionary relationships.	Classification Eukaryotic Cells Prokaryotic Cells
The historical development and changing nature of classification systems.	Classification
Similarities and differences between eukaryotic and prokaryotic organisms.	Eukaryotic Cells Prokaryotic Cells
Similarities and differences among the eukaryotic kingdoms: Protists, Fungi, Plants, Animals.	Classification
Classify organisms using keys.	Classification What is a species?
4.02 Analyze the processes by which organisms representative of the following groups (unicellular protists, annelid worms, insects, amphibians, mammals, non vascular plants, gymnosperms and angiosperms) accomplish essential life functions including: transport, excretion, respiration, regulation, nutrition, synthesis, reproduction, and growth and development.	Cells to Organisms Eukaryotic Cells Prokaryotic Cells The Endocrine System The Respiratory System The Kidneys
4.03 Assess, describe and explain adaptations affecting survival and reproductive success.	
Structural adaptations in plants and animals (form to function).	Animal Adaptations Plant Adaptation Specialized Plant Cells

Disease-causing viruses and microorganisms.	HIV and AIDS Infectious Disease Superbugs
Co-evolution.	Host-Parasite Relationships
4.04 Analyze and explain the interactive role of internal and external factors in health and disease:	
Genetics.	Genetic Mutations Genetic Variation Inherited Diseases
Immune response.	Antibodies and Vaccinations Immune Responses Immune System
Nutrition.	Nutrition
Parasites.	Host-Parasite Relationships
Toxins.	Infectious Disease
4.05 Analyze the broad patterns of animal behavior as adaptations to the environment.	
Innate behavior	Behavior
Learned behavior	Behavior
Social behavior	Behavior
Competency Goal 5: The learner will develop an understanding of the ecological relationships among organisms.	
5.01 Investigate and analyze the interrelationships among organisms, populations, communities, and ecosystems.	
<i>Techniques of field ecology</i>	–
Abiotic and biotic factors	Ecosystems Ecosystems and Succession
Carrying capacity	Describing Populations
5.02 Analyze the flow of energy and the cycling of matter in the ecosystem	
Relationship of the carbon cycle to photosynthesis and respiration.	Carbon Cycle Recycling Nutrients
Trophic levels - direction and efficiency of energy transfer.	Ecosystems Energy Loss in Food Chains Energy Transfer Food Chains Food Webs
5.03 Assess human population and its impact on local ecosystems and global environments:	
Historic and potential changes in population.	Human Impact on the Environment

Factors associated with those changes.	Human Impact on the Environment
Climate change.	Climate Change
Resource use.	Over-fishing
Sustainable practices/stewardship.	Sustainability