

Oxford Area School District Science Scope and Sequence – Quarter 1:

Grade 7

3.1.5-8.A1

3.1.5-8.A3

- Describe the similarities and differences of major physical characteristics in plants, animals, fungi, protists and bacteria.
- Describe the similarities and differences of physical characteristics in diverse organisms.
- Compare and contrast the similarities and differences in life cycles of different organisms.
- Explain why the life cycles of different organisms have varied lengths

3.1.5-8.A4

3.1.5-8.A5

- Recognize that all organisms are composed of cells and that many organisms are unicellular and must carry out all life functions in one cell
- Explain how cells arise from pre-existing cells
- Explain the concept of a cell as the basic unit of life. Compare and contrast plant and animal cells.
- Describe basic structures that plants and animals have that contribute to their ability to make or find food and reproduce
- Explain how the cell is the basic structural and functional unit of living things

3.1.5-8.A6

3.1.5-8.A7

- Identify examples of unicellular and multicellular organisms.
- Identify the levels of organization from cell to organism
- Compare life processes (e.g. growth, digestion) at the organism level with life processes at the cellular level.

Oxford Area School Science Scope and Sequence – Quarter 2:

Grade 7

3.1.5-8.A8

- SCALE Explain why the details of most cells are visible only through a microscope.
- MODELS Apply the appropriate models to show interactions among organisms in an environment
- CHANGE AND CONSTANCY Explain mechanisms organisms use to adapt to their environment.

3.1.7-8.B1  
3.1.5-8.B2

- Explain how genetic instructions influence inherited traits. Identify Mendelian patterns of inheritance.
- Compare sexual reproduction with asexual reproduction

3.1.5-8.B4  
3.1.5-8.B5

- Describe how selective breeding and biotechnology can alter the genetic composition of organisms.
- PATTERNS Compare and contrast observable patterns in the physical characteristics across families, strains and species.

3.1.7-8.C1  
3.1.5.7-8.C2

- Describe how natural selection is an underlying factor in a population's ability to adapt to changes
- Explain how reproductive success coupled with advantageous traits over many generations contributes to natural selection.
- Explain why the extinction of a species may occur when the environment changes. Explain that mutations can alter a gene and are the original source of new variations in a population.

3.1.7-8.C3

- CONSTANCY AND CHANGE Identify evidence drawn from geology, fossils, and comparative anatomy that provides the basis for the theory of evolution.

Oxford Area School District Science Scope and Sequence – Quarter 3:

Grade 7

4.1.7.A  
4.1.7.C

- Describe the relationships between biotic and abiotic components of an ecosystem.
- Compare and contrast different biomes and their characteristics.
- Describe symbiotic and predator/ prey relationships.
- Explain the flow of energy within an ecosystem.
- Compare and contrast the flow of energy between organisms in different habitats.
- Explain the concept of trophic levels.

4.1.5-8.D

- Explain the differences between threatened, endangered, and extinct organisms.
- Identify reasons why organisms become threatened, endangered, and extinct.
- Explain how biological diversity relates to the viability of ecosystems.
- Compare and contrast monoculture with diverse ecosystems.
- Explain how biological diversity relates to the ability of an ecosystem to adapt to change.
- Explain how an adaptation is an inherited, structure, function, or behavior that helps an organism survive and reproduce.
- Use the theory of natural selection to examine the causes and consequences of extinction.

4.1.7.E

- Identify factors that contribute to change in natural and human-made systems.
- Explain the processes of primary and secondary succession in a given ecosystem.

Oxford Area School District Science Scope and Sequence – Quarter 4:

Grade 7

4.2.5-8.C

- Identify physical, chemical, and biological factors that affect water quality.
- Identify natural and human made factors that affect water quality.
- Use appropriate tools and techniques to analyze a freshwater environment.
  - Interpret physical, chemical, and biological data as a means of assessing the environmental quality of a freshwater environment.
- Describe how a diversity index is used to assess water quality.

4.4.7.D  
4.5.7.B

- Identify the positive and negative effects of technology used in agriculture and its effects on the food and fiber system and the environment over time.
- Describe the impact of pests in different geographic locations and techniques used to manage those pests. • Identify introduced species that are classified as pests in their new environments. • Research integrated pest management practices.

4.5.7.E

- Describe how length and degree of exposure to pollutants may affect human health.
- Identify diseases/ conditions that have been associated with exposure to pollutants.

3.1.A: Organisms and Cells			
<b>Big Idea</b> <b>The cell is the basic unit of structure and function for all living things.</b>			
Standard - 3.1.6.A8		Essential Question: How can one cell function as an organism?	
<u>SCALE</u>  Explain why the details of most cells are visible only through a microscope.			
Concepts	Competencies	Resources	Assessments
<p>S6.A.1.1.1 Explain how certain questions can be answered through scientific inquiry and/or technological design (e.g., consumer product testing, common usage of simple machines, modern inventions).</p> <p>S6.A.1.1.2 Use evidence to support inferences and claims about an investigation or relationship (e.g., common usage of simple machines).</p> <p>S6.A.1.1.3 Predict the outcome of an experiment based on previously collected data.</p> <p>S6.A.1.2.1 Use evidence, observations, or explanations to make inferences about changes in systems over time.</p> <p>S6.A.2.2.1 Describe ways technology extends and enhances</p>	<p>Identify examples of the relationship(s) between structure and function in the living world.</p>	<p><b>Science Fusion 2017 Module A Discovery Streaming BrainPOP</b></p>	

<p>human abilities for specific purposes (e.g., make observations of cells with a microscope and planets with a telescope).</p>			
<p><b>Vocabulary</b>  <i>Magnification, lense, objective, nosepiece, arm, base, scale</i></p>			

<p>3.1.A: Organisms and Cells</p>			
<p><b>Big Idea</b>  <b>The cell is the basic unit of structure and function for all living things.</b></p>			
<p>Standard - 3.1.6.A4</p> <p>Recognize that all organisms are composed of cells and that many organisms are unicellular and must carry out all life functions in one cell.</p> <p>Standard - 3.1.7.A4</p> <p>Explain how cells arise from pre-existing cells.</p>	<p>Essential Question: How can one cell function as an organism?</p>		
<p><b>Concepts</b></p>	<p><b>Competencies</b></p>	<p><b>Resources</b></p>	<p><b>Assessments</b></p>
<p>S6.A.3.1.1 Describe a system as a group of related parts with specific roles that work together to achieve an observed result.</p> <p>S6.B.1.1.1 Describe how cells carry out the many functions needed to sustain life.</p> <p>S6.B.1.1.2 Identify examples of unicellular and multi-cellular organisms (i.e., plants, fungi,</p>	<p>Identify examples of the relationship(s) between structure and function in the living world.</p>	<p><b>Science Fusion 2017                  Module A                  Discovery Streaming                  BrainPOP</b></p>	

<p>bacteria, protista, and animals).</p> <p>S6.B.1.1.3 Explain how many organisms are unicellular and must carry out all life functions in one cell.</p> <p>S7.B.1.2.1 Explain how cells arise from the division of a pre-existing cell.</p>			
<p><b>Vocabulary</b>  <i>Cell, Organism, Organelle</i></p>			

<p>3.1.A: Organisms and Cells</p>	
<p><b>Big Idea</b>  <b>The cell is the basic unit of structure and function for all living things.</b></p>	
<p>Standard - 3.1.5.A5</p> <p>Explain the concept of a cell as the basic unit of life.</p> <p>Compare and contrast plant and animal cells.</p> <p>3.1.6.A5</p> <p>Describe basic structures that plants and animals have that contribute to their ability to make or find food and reproduce.</p> <p>3.1.7.A5</p> <p>Explain how the cell is the basic structural and functional unit of living</p>	<p>Essential Question: How can one cell function as an organism?</p>

things.			
Concepts	Competencies	Resources	Assessments
<p>S5.B.1.1.1 Recognize that all organisms are composed of cells.</p> <p>S5.B.1.1.2 Explain the concept of the cell as the basic structural unit of all living things.</p> <p>S5.B.1.1.3 Compare the structure and function of basic cell parts in organisms (i.e., plants and animals).</p> <p>S6.B.1.1.1 Describe how cells carry out the many functions needed to sustain life.</p> <p>S6.B.1.1.3 Explain how many organisms are unicellular and must carry out all life functions in one cell.</p> <p>S7.A.3.1.2 Explain the concept of order in a system (e.g., first to last manufacturing steps; trophic levels; simple to complex—levels of biological organization from cell to organism).</p> <p>S7.B.1.1.1 Describe levels of biological organization from cell to organism.</p> <p>S7.B.1.1.2 Describe how specific structures in living things (from cell</p>	<p>Identify examples of the relationship(s) between structure and function in the living world.</p> <p>Describe the flow of energy from the sun, throughout the earth system, living and non-living, from the cellular scale to the global scale, and describe the transformations of that energy as it moves through the system.</p>	<p><b>Science Fusion 2017 Module A Discovery Streaming BrainPOP</b></p>	

<p>to organism) help them function effectively in specific ways (e.g., chlorophyll in plant cells— photosynthesis; root hairs— increased surface area; beak structures in birds— food gathering; cacti spines—protection from predators).</p> <p>S7.B.1.2.1 Explain how cells arise from the division of a pre-existing cell.</p> <p>S7.B.1.2.2 Compare various basic sexual and asexual reproductive processes (e.g., budding, cuttings).</p>			
<p><b>Vocabulary</b> <i>Nucleus, Cell Membrane, Prokaryote, Cytoplasm, Eukaryote, cytoskeleton, cell wall, mitochondrion, vacuole, ribosome, chloroplast, endoplasmic reticulum, lysosome, golgi complex, homeostasis, diffusion, photosynthesis, osmosis, cellular respiration, active transport, mitosis, endocytosis, passive transport, exocytosis, chlorophyll,</i></p>			

<p>3.1.A: Organisms and Cells</p>	
<p><b>Big Idea</b>  <b>The cell is the basic unit of structure and function for all living things.</b></p>	
<p>Standard - 3.1.6.A6</p> <p>Identify examples of unicellular and multicellular organisms.</p> <p>Standard - 3.1.7.A6</p>	<p>Essential Question: How can one cell function as an organism?</p>

<p>Identify the levels of organization from cell to organism.</p> <p>3.1.7.A7</p> <p>Compare life processes (e.g. growth, <b>digestion</b>) at the organism level with life processes at the cellular level.</p>			
Concepts	Competencies	Resources	Assessments
<p>S6.B.1.1.2 Identify examples of unicellular and multi-cellular organisms (i.e., plants, fungi, bacteria, protista, and animals).</p> <p>S6.B.1.1.3 Explain how many organisms are unicellular and must carry out all life functions in one cell.</p> <p>S7.A.3.1.1 Describe a system (e.g., ecosystem, circulatory system, agricultural system) as a group of related parts with specific roles that work together to achieve an observed result.</p> <p>S7.A.3.1.2 Explain the concept of order in a system (e.g., first to last manufacturing steps; trophic levels; simple to complex—levels of biological organization from cell to organism).</p> <p>S7.B.1.1.1 Describe levels of biological organization from cell to</p>	<p>Describe the flow of energy from the sun, throughout the earth system, living and non-living, from the cellular scale to the global scale, and describe the transformations of that energy as it moves through the system.</p> <p>Identify examples of the relationship(s) between structure and function in the living world.</p>	<p><b>Science Fusion 2017 Module A &amp; Module D Discovery Streaming BrainPOP</b></p>	

<p>organism.</p> <p>S7.B.1.1.2 Describe how specific structures in living things (from cell to organism) help them function effectively in specific ways (e.g., chlorophyll in plant cells— photosynthesis; root hairs— increased surface area; beak structures in birds— food gathering; cacti spines—protection from predators).</p> <p>S7.B.1.1.3 Explain how characteristic similarities and differences (from cell to organism) are used to identify and/or categorize organisms.</p>			
<p><b>Vocabulary:</b> <i>organism, organ system, tissue, structure, organ, function</i></p>			

<p>3.1.B: Genetics</p>	
<p><b>Big Idea</b>  <b>Hereditary information in genes is inherited and expressed.</b></p>	
<p>Standard - 3.1.7.B1</p> <p>Explain how <b>genetic</b> instructions influence inherited traits.</p> <p>Identify <b>Mendelian patterns of inheritance.</b></p>	<p><b>Essential Question:</b> How is the hereditary information in genes inherited and expressed?</p>

<p>Standard - 3.1.7.B2</p> <p>Compare <b>sexual reproduction</b> with <b>asexual reproduction</b>.</p> <p>3.1.7.B4</p> <p>Describe how selective breeding and <b>biotechnology</b> can alter the <b>genetic</b> composition of <b>organisms</b>.</p> <p>3.1.7.B5</p> <p><u>PATTERNS</u></p> <p>Compare and contrast observable patterns in the physical characteristics across <b>families, strains</b> and <b>species</b>.</p>			
Concepts	Competencies	Resources	Assessments
<p>S7.B.1.1.1 Describe levels of biological organization from cell to organism.</p> <p>S7.B.2.2.1 Identify and explain differences between inherited and acquired traits.</p> <p>S7.B.2.2.2 Recognize evidence that the gene is the basic unit of inheritance and explain the effect of dominant and recessive genes on inherited traits.</p> <p>S7.B.2.2.3 Explain how mutations can alter a gene and are a source of new variations in a population.</p>	<p>Describe the role of DNA in protein synthesis, reproduction and evolution.</p> <p>Pose questions and provide evidence-based explanations about understanding and observations of biological phenomena and processes.</p> <p>Identify and describe various ways models are used to explain, interpret, and predict, biological phenomena/systems.</p>	<p><b>Science Fusion 2017 Module A &amp; Module B Discovery Streaming BrainPOP</b></p>	

<p>S7.B.1.2.1 Explain how cells arise from the division of a pre-existing cell.</p> <p>S7.B.1.2.2 Compare various basic sexual and asexual reproductive processes (e.g., budding, cuttings).</p> <p>S7.B.1.2.3 Explain why the life cycles of different organisms have varied lengths.</p> <p>S7.B.2.1.1 Explain how inherited traits (genes) and/or behaviors help organisms survive and reproduce in different environments.</p> <p>S7.B.2.2.4 Describe how selective breeding or biotechnologies can change the genetic makeup of an organism (e.g., domesticated dogs, horses, cows; crops, hybrid plants; integrated pest management).</p>			
<p><b>Vocabulary:</b> <i>DNA, interphase, chromosome, mitosis, cell cycle, cytokinesis, homologous chromosomes, meiosis, asexual reproduction, sexual reproduction, fertilization, heredity, dominant, gene, recessive, allele, incomplete dominance, genotype, phenotype, codominance, Punnett Square, ratio, probability, pedigree</i></p>			

3.1.C: Evolution			
<b>Big Idea</b> Populations of organisms evolve by natural selection.			
3.1.7.C1  Describe how natural selection is an underlying factor in a population's ability to adapt to changes.  3.1.8.C1  Explain how reproductive success coupled with advantageous traits over many generations contributes to natural selection.  3.1.5.C2  Give examples of how inherited characteristics (e.g., shape of beak, length of neck, location of eyes, shape of teeth) may change over time as adaptations to changes in the environment that enable organisms to survive.  3.1.8.A8  <u>CHANGE AND CONSTANCY</u>  Explain mechanisms organisms use to adapt to their environment.		<b>Essential Question:</b> What allows some populations of organisms to change and survive while others cannot?	
Concepts	Competencies	Resources	Assessments
S7.B.2.1.1 Explain how inherited traits (genes) and/or behaviors help organisms survive and reproduce in different environments.  S7.B.2.1.2 Describe how natural selection is an underlying factor in a population's ability to adapt to	Identify examples of the relationship(s) between structure and function in the living world.	<b>Science Fusion 2017 Module B &amp; Module D Discovery Streaming BrainPOP</b>	

<p>change.</p> <p>S7.B.2.1.3 Explain that adaptations within species (physical, behavioral, physiological) are developed over long periods of time.</p> <p>S7.B.2.2.1 Identify and explain differences between inherited and acquired traits.</p> <p>S7.B.2.2.3 Explain how mutations can alter a gene and are a source of new variations in a population.</p> <p>S8.B.2.1.2 Explain how different adaptations in individuals of the same species may affect survivability or reproduction success.</p> <p>S8.B.2.1.3 Explain that mutations can alter a gene and are the original source of new variations.</p> <p>S8.B.2.1.5 Explain that adaptations are developed over long periods of time and are passed from one generation to another.</p> <p>S5.B.2.1.4 Identify changes in environmental conditions that can affect the survival of populations and entire species.</p>			
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<b>Vocabulary: evolution, variation, adaptation, extinction, natural selection, mutation</b>			

3.1.C: Evolution			
<b>Big Idea</b>			
Populations of organisms evolve by natural selection.			
3.1.7.C2  Explain why the extinction of a species may occur when the environment changes.  Explain that mutations can alter a gene and are the original source of new variations in a population.  3.1.7.C3  <u>CONSTANCY AND CHANGE</u>  Identify evidence drawn from geology, fossils, and comparative anatomy that provides the basis for the theory of evolution.		Essential Questions: What allows some populations of organisms to change and survive while others cannot?	
<b>Concepts</b>	<b>Competencies</b>	<b>Resources</b>	<b>Assessments</b>

<p>S7.D.1.1.2 Explain how fossils are formed and how they can provide evidence about plants and animals that once lived on Earth.</p> <p>S7.B.2.1.2 Describe how natural selection is an underlying factor in a population’s ability to adapt to change.</p> <p>S7.B.2.1.3 Explain that adaptations within species (physical, behavioral, physiological) are developed over long periods of time.</p> <p>S7.B.2.2.3 Explain how mutations can alter a gene and are a source of new variations in a population.</p>	<p>Identify examples of the relationship(s) between structure and function in the living world.</p> <p>Provide examples of when it is correct to use the terms “scientific theory” as opposed to an opinion.</p>	<p><b>Science Fusion 2017 Module B Discovery Streaming BrainPOP</b></p>	
<p><b>Vocabulary: <i>DNA, mutation, nucleotide, RNA, replication, ribosome, adaptation, natural selection</i></b></p>			