

RCSD Foundations of Biology * Quick Reference Pacing Guide * 2024-2025

***Note: This document is meant to be a quick reference of the standards covered each nine weeks.**

For a complete description of the course, standards and detailed performance objectives,

see the [MS College and Career Readiness Standards for Science](#)

1st Term: Aug. 1 - Oct. 4 <i>July 25-26;29-31 - Staff Development Aug. 1 - First Day of School Sept 2 -Labor Day/Holiday Oct. 7-11 - School Holiday/Fall Break Oct. 14 - Staff Development</i>	2nd Term: Oct. 15 - Dec. 20 <i>Nov. 25-29 - Thanksgiving Break Dec. 16 - 20 - Exams Dec. 20 - Reduced Day Dec. 23 - Jan. 3 - Christmas Break</i>	3rd Term: Jan. 7 - Mar 7 <i>Jan. 6 - Staff Development Jan. 7 - Students Return Jan. 20 - MLK Day/Holiday Feb. 17 - Presidents' Day/Holiday March 10 - 14 - Spring Break</i>	4th Term: March 17 - May 23 <i>April 18, 21 - Easter/Holiday *STATE TESTING Window opens mid-April* May 19-23 - Exams May 23 - Reduced Day May 23 - Last Teacher Day</i>
<p>Science and Engineering Practices *Tools and Technology; Safety *Norms of Scientific Investigations *Introduction to Labs and Lab Reports *Unifying Themes in Biology</p> <p>*These are concepts and skills that should be incorporated in lessons throughout the year.</p> <p><u>FB.1 Students will relate the importance of significant historical biological experiments and their impact of these on research, development, and society.</u></p> <p><i>FB.1.1 - Identify and communicate the contributions of famous scientists and their experiments that formed fundamental biological principles.</i></p> <p><i>FB.1.2 - Trace and model the historical development of scientific ideas and theories related to life science through a timeline (e.g. creation of the microscope, discovery of cells/cell theory, structure of DNA, etc.)</i></p>	<p><u>FB.2 Students will demonstrate an understanding of the structure and interactions of matter and how the organization of matter supports living organisms.</u></p> <p><i>FB.2.5 - Investigate how the properties of water contribute to the maintenance of living cells and organisms.</i></p> <p><i>FB.2.6 - Explain the role of the major biomolecules to the survival of organisms (proteins, carbohydrates, lipids, nucleic acids).</i></p> <p><i>FB.2.7 - Explore the structure of these biomolecules; relate the structure to their function in living things.</i></p> <p><u>FB.3 Students will demonstrate an understanding of how the structure of living organisms supports the essential functions of life.</u></p> <p><i>FB.3.1 - Compare and contrast prokaryotic and eukaryotic cells and plant/animal/bacterial cells.</i></p>	<p><u>FB.4 Students will demonstrate an understanding of how genetic information is transferred from parent to offspring.</u></p> <p><i>FB.4.1 - Compare and contrast the basic structure and function of nucleic acids.</i></p> <p><i>FB.4.2 - Obtain and communicate information illustrating the relationship among DNA, genes, chromosomes, and proteins.</i></p> <p><i>FB.4.3 - Use models (Punnett squares) and mathematical reasoning (probability) to describe and predict patterns of inheritance of single genetic traits from parents to offspring (e.g. dominant/recessive traits, incomplete dominance, codominance, multiple alleles, sex-linkage)</i></p> <p><i>FB.4.4 - Obtain and communicate information to describe how mutations may affect genetic expression and provide examples.</i></p> <p><i>FB.4.5 - Research and report genetic</i></p>	<p><u>FB.5 Students will demonstrate an understanding of Earth's fossil record and its indication of the diversity of life over time.</u></p> <p><i>FB.5.4 Investigate how biological adaptations and genetic variations of traits in a population enhance the probability of survival in an environment (natural selection).</i></p> <p><i>FB.5.5 Enrichment: Create and analyze models that illustrate the relatedness between all living things (cladograms/phylogenetic trees).</i></p> <p><u>FB.6 Students will understand the interdependence of living organisms and their environment.</u></p> <p><i>FB.6.1 Compare and contrast abiotic and biotic factors.</i></p> <p><i>FB.6.2 Use models to analyze the cycling of matter in an ecosystem (e.g. water, carbon, oxygen, nitrogen)</i></p> <p><i>FB.6.3 Obtain, evaluate, and communicate information to explain</i></p>

<p>FB.1.3 - Research, analyze, explain, and communicate how scientific enterprise relates to society and classic inventions. (e.g. microscope, blood typing, gel electrophoresis, DNA sequencing)</p> <p>FB.1.4 - Enrichment: Research, analyze, explain and communicate the influence of society, including cultural components, on the direction and progress of science and technology.</p> <p><u>FB.2 Students will demonstrate an understanding of the structure and interactions of matter and how the organization of matter supports living organisms.</u></p> <p>FB.2.1 - Develop and use simple atomic models to describe the components of elements.</p> <p>FB.2.2 - Obtain and use information about elements (particularly those crucial to organisms) to describe the organization of the periodic table.</p> <p>FB.2.3 - Use information about those elements to determine what types of bonds will form between them (ionic, covalent, hydrogen)</p> <p>FB.2.4 - Analyze and interpret data to classify solutions as acids, bases or neutral. Communicate the importance of pH in living systems.</p>	<p>FB.3.2 - Use models to investigate and explain structure and function of cell organelles.</p> <p>FB.3.3 - Compare and contrast active and passive transport. Analyze the movement of water across a cell membrane in hypotonic, hypertonic and isotonic solutions.</p> <p>FB.3.4 - Analyze the relationship between photosynthesis and cellular respiration and explain that relationship in terms of the need for all living things to acquire energy from their environment.</p> <p>FB.3.5 - Use models to explain how ADP and ATP cycle to store and release chemical energy using inorganic phosphate.</p> <p>FB.3.6 - Compare and contrast the processes and results of mitosis and meiosis.</p> <p>FB.3.7 - Enrichment: Research and orally communicate the possible outcomes of errors in mitosis (cancer) or meiosis (nondisjunction).</p>	<p>technologies that may improve the quality of life (e.g. genetic engineering, cloning, gene splicing, DNA testing, etc).</p> <p>FB.4.6 Enrichment: Debate the pros and cons of using biotechnology to manipulate genetic information for human purpose.</p> <p><u>FB. 5 Students will demonstrate an understanding of Earth's fossil record and its indication of the diversity of life over time.</u></p> <p>FB.5.1 - Investigate through research the contributions of scientists to the theory of evolution and evolutionary processes (e.g. Needham, Spallanzani, Redi, Pasteur, Lyell, Lamarck, Malthus, Wallace, Darwin)</p> <p>FB.5.2 - Analyze and interpret data to support claims that different types of fossils provide evidence of the diversity of life that has existed on Earth and of the relationships between past and existing life on Earth.</p> <p>FB.5.3 - Obtain and communicate information to explain how DNA evidence and fossil records support Darwin's theory of evolution.</p>	<p>relationships that exist between abiotic and biotic components of an ecosystem. Explain how changes in biotic and abiotic components affect the balance of an ecosystem over time.</p> <p>FB.6.4 Develop and use models to discuss the climate, flora, and fauna of the terrestrial and aquatic biomes of the world.</p> <p>FB.6.5 Use models to analyze the flow of energy through food chains, food webs and pyramids.</p> <p>FB.6.6 Engage in scientific argument from evidence to distinguish organisms that exist in symbiotic (mutualism, parasitism, commensalism) or co-evolutionary (predator-prey, cooperation, competition, and mimicry) relationships within ecosystems.</p> <p>FB.6.7 Enrichment: Design solutions to reduce the impact of human activity on ecosystems.</p>
--	---	--	--

