

Basic Biology

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Content	Skills	Learning Targets	Assessment	Resources & Technology
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<p>CEQ (tri 1)</p> <p>1. What are the parts of the biological scientific process?</p> <p>2. What are the essential molecules and elements in living organisms?</p> <p>3. How do cells perform all of life's functions & maintain homeostasis?</p> <p>(tri 2)</p> <p>4. What is DNA's role in hereditary, reproduction, cellular function and genetic engineer practices?</p> <p>5. What is Darwin's theory: Evolution by Natural Selection?</p>	<p><u>Nature of Biological Science & Cells</u></p> <p>Tri 1 Students will be able to (SWBAT)...</p> <p>1. Identify hypothesis, control, constant(s), independent & dependent variables in an experiment.</p> <p>2. Collect, analyze & create accurate conclusions from data.</p> <p>3. Explain the 5 characteristics of living things. (G.R.A.C.E.)</p> <p>4. Describe the basic molecular structures & primary functions of the 4 carbon based macromolecules (carbohydrates, lipids, proteins & nucleic acids).</p> <p>5. Using the molecular structure of a water molecule, explain the properties of water (cohesion, adhesion, capillary action, polarity &</p>	<p>TRI 1</p> <p><i>Scientific method</i></p> <p>1. <i>I can make observations and form a question into a testable hypothesis.</i></p> <p>2. <i>I can design, conduct and gather data in an experiment to test my hypothesis.</i></p> <p>3. <i>I can generate a data table & appropriate graph for the data set in my experiment.</i></p> <p>4. <i>I can analyze the data with appropriate calculations or observations made.</i></p> <p>5. <i>I can identify a constant, control group, independent & dependent variables in an experiment.</i></p> <p>6. <i>I can draw conclusions that are supported by the data and consider alternative explanations if needed.</i></p>	<p>weekly quizzes or chapter tests are in the shared folder on HS network</p>	

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<p>6. How are biotic and abiotic factors interdependent on Earth?</p> <p><u>SEMESTER 1</u></p> <p>UEQ</p> <p>SCIENTIFIC METHOD</p> <ul style="list-style-type: none"> How is the scientific method used for scientific study? <p>What characteristics do all living organisms share?</p> <p>MOLECULES OF LIFE</p> <p>What are the basic chemical properties &</p>	<p>pH) and why it makes a good solvent.</p> <p>6. Summarize the important role that enzymes play in chemical reactions and bonds in living organisms.</p> <p>7. Demonstrate effective use of compound microscopes.</p> <p>8. Compare & contrast: prokaryote cells, eukaryote cells & viruses.</p> <p>9. Identify these organelles and their functions: mitochondria, chloroplast, nucleus, ribosomes, chromosomes, cell membrane, vacuole, lysosomes, endoplasmic reticulum, golgi apparatus, cell wall.</p> <p>10. Define homeostasis.</p> <p>11. Explain how cells maintain homeostasis.</p> <p>12. Compare and contrast how cells convert light energy to chemical (ATP) energy through the</p>	<p>7. <i>I can analyze data for errors & its impact on the conclusion, to improve the experimental test.</i></p> <p>BioChem</p> <p>1. <i>I can name and describe the major characteristics of living things (GRACE).</i></p> <p>2. <i>I can define and give examples for the properties of water. (Polarity, cohesion, adhesion, surface tension, capillary action, hydrophobic & hydrophilic ends/molecules.)</i></p> <p>3. <i>For lipids, proteins, carbohydrates & nucleic acids, I can give examples, elements within & why the following molecules are essential for living organisms and why “its all about carbon”.</i></p> <p>4. <i>For the pH scale: I</i></p>		

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<p>functions for the molecules of life?</p> <p>Water, lipids, proteins, carbohydrates & nucleic acids</p> <ul style="list-style-type: none"> ▪ Why are enzymes essential to living organisms? <p>CELLS: TYPES, TISSUES & ORGANS</p> <p>How do viruses, prokaryote cells & eukaryote cells differ?</p> <ul style="list-style-type: none"> ▪ How do cells and organs help maintain homeostasis? <p>How do various cell organelles carry out the basic life processes?</p>	<p>processes of photosynthesis and respiration.</p> <p>13. Define photosynthesis and respiration in terms of reactants and products.</p> <p>14. Generalize how cells produce antibodies to fight diseases, how antibiotics fight disease and vaccines help with immunity.</p> <p>15. Prepare and analyze a scientific experiment with live bacteria to test the effectiveness of various antibiotics in a petri dish.</p> <p>Semester 2 Students will be able to (SWBAT)...</p> <p>DNA & genetics</p> <p>1. Describe the basic molecular structure of DNA molecules.</p> <p>2. Describe how DNA replicates itself.</p>	<p><i>can determine acids, basics, neutral on the 0-14 scale.</i></p> <p><i>I can tell how pH is measured in ions of OH- & H+ and with the universal indicator.</i></p> <p><i>I can conduct an experiment to determine the pH factors in common household items such as baking soda, milk, shampoo, flavored water, toothpaste, etc</i></p> <p><i>5. i can describe how the body maintains homeostasis with various molecules.</i></p> <p><i>6. I can summarize how enzymes aid in chemical reactions & help maintain homeostasis.</i></p> <p>Cells</p> <p><i>1. I can compare & contrast plant, animal & bacterial cells.</i></p> <p><i>2. I can identify cell</i></p>		

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<p><u>SEMESTER 2 UEQ</u></p> <p><u>DNA & GENETICS</u></p> <p><i>§ How does DNA's structure provide information for assembling proteins, making new cells (mitosis) and express genetic traits?</i></p> <p><i>§ How do Mendel's laws and meiosis increase genetic variation and determine various patterns of inheritance?</i></p> <p><i>§ How do mutations affect organisms?</i></p> <p><i>§ What are some pros and cons of using biotechnology and genetically modified organisms?</i></p>	<ol style="list-style-type: none"> 3. Describe the phases of mitosis. 4. Outline the steps of protein synthesis with transcription and translation. 5. Explain and recognize the forms of RNA (m, t & r) 6. Explain the relationships amongst DNA, genes & chromosomes. 7. Apply the terms of phenotype, genotype, allele, homozygous, heterozygous in genetic crosses with Punnett squares. 8. Recognize how uncontrolled mitosis results in cancer cells. 9. Explain how mutations affect organisms. 10. Critique the risks & benefits of genetically modified organisms or 	<p><i>organelles & their functions (mitochondria, chloroplast, nucleus, ribosomes, chromosomes, cell membrane, vacuoles, lysosomes, endoplasmic reticulum, golgi apparatus, cell wall)</i></p> <ol style="list-style-type: none"> 3. <i>I can describe the basic organs of the human body and how they are made of various tissues & work as part of a system to maintain homeostasis within the body.</i> 4. <i>I can compare & contrast how cells convert sunlight energy to ATP & into glucose molecules using chemical equations, organelles & electrons in the molecules.</i> 5. <i>I can generalize how cells produce antibodies to fight diseases and how antibiotics kill bacteria cells & how vaccines help with immunity.</i> 6. <i>I can prepare and</i> 		

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<p><u>DARWIN: VARIATION & GENES</u></p> <p>§ How did Darwin use his observations & Natural Selection theory to describe the historical changes of life on Earth?</p> <p><u>ECOLOGY: ENERGY NUTRIENT CYCLES & TROPHIC LEVELS</u></p> <p>§ <i>How does energy flow through an ecosystem?</i></p> <p>§ <i>How does matter recycle in the biogeochemical cycles and provide molecules for living organisms?</i></p> <p><u>ISSUES HUMAN IMPACT</u></p> <p>§ <i>How do humans impact</i></p>	<p>biotechnology techniques in our food supply.</p> <p>Darwin & Evolution</p> <ol style="list-style-type: none"> Summarize Darwin’s theory of natural selection with terms: variation, adaptation, struggle for existence, survival of the fittest and evolution. Evaluate how various pieces of evidence support Darwin’s theory and connect to DNA. (homologous structures, embryology, fossils & DNA) <p>Ecology</p> <ol style="list-style-type: none"> Trace the energy flow through an ecosystem via trophic levels of producers and consumers. Compare and contrast nutrient cycles and explain their importance to molecules that are vital to 	<p><i>analyze a scientific experiment with live bacteria to test the effectiveness of various antibiotics.</i></p> <p><u>Semester 2</u></p> <p>DNA & Genetics</p> <ol style="list-style-type: none"> I can describe how the structure of DNA molecule. I can describe how DNA unzips to make a copy of itself in replication. I can identify & describe what is happening to DNA during the phase of mitosis (cell division). I can describe how cancer is uncontrolled cell division and how chemotherapy or radiation stops the cell cycle. I can describe how DNA makes RNA and the steps in protein synthesis. 		

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<p><i>the natural world around them and an ecosystems' sustainability?</i></p>	<p>living things. 3. Critique how current ecological issues are influenced by human actions.</p>	<p>6.I can describe how DNA varies to create mutations to the genetic code. 7. I can use punnett squares to determine the genetic probability of offspring by the genotypic or phenotypic ratios. 8. I can define homozygous, heterozygous, genotype & phenotype of genetic traits. 9. I can describe the relationship between chromosomes, genes, DNA and traits.</p> <p>Darwin & Evolution</p> <p>1. I can summarize Darwin's theory of natural selection with terms: variation, adaptation, struggle for existence, survival of the fittest and evolution. 2. I can describe how various pieces of evidence</p>		

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		<p>support Darwin’s theory and connect to DNA. (homologous structures, embryology, fossils & DNA)</p> <p>Ecology</p> <ol style="list-style-type: none"> 1. I can trace the energy flow through an ecosystem via trophic levels of producers and consumers. 2. I can compare and contrast nutrient cycles and explain their importance to molecules that are vital to living things. (C, N, P & water) 3. I can research and critique how current ecological issues are influenced by human actions. (local and global) 		