

**Science Standards: Biology**

Any standard <b>highlighted in yellow</b> has been determined by our WCS D teachers, district and state content experts as essential for students to master.				This column relates to the further rigor of Honors Biology.
Standard 1 <i>Students will understand that living organisms interact with one another and their environment.</i>				<i>Further Rigor Points</i>
<b>Learning Targets</b>	<b>Academic Vocabulary</b>	<b>Questions Stems</b>	<b>Possible Assessments</b>	
<p>1- Create models to explain how energy flows through an ecosystem</p> <p>2- Classify and predict interactions among organisms.</p>	<p><b>predator-prey, symbiosis, competition, ecosystem, carbon cycle, nitrogen cycle, oxygen cycle, population, diversity, energy pyramid, consumers, producers, limiting factor, competition, decomposers, food chain, biotic, abiotic, community, variable, evidence, inference, quantitative, qualitative</b></p>	<p><b>Will climate change influence existing ecosystems?</b></p> <p><b>Is there economical value in protecting endangered native species by getting rid of invasive species?</b></p> <p><b>Why did introducing the wolves at Yellowstone increase the health of riparian systems, and change the behavior of the river?</b></p> <p><a href="#">Wolf Video</a></p>	<p><b>Starburst Activity</b>  <a href="https://drive.google.com/drive/u/0/folders/0B8yRZNfg1U_dY2pEVHJTYTNOcHM">https://drive.google.com/drive/u/0/folders/0B8yRZNfg1U_dY2pEVHJTYTNOcHM</a></p> <p><b>Energy Pyramid - cut &amp; paste</b></p> <p><b>Project Wild Oh Deer</b>  <a href="http://www.projectwild.org/documents/projectWILD.pdf">http://www.projectwild.org/documents/projectWILD.pdf</a></p> <p><b>How many Bears? Good Buddies</b></p> <p><b>Video Clip Activity</b></p>	<p>DOK 3 Hypothesize the effect of human activities on cycles.</p> <p>DOK 4 Predict effects of extinction on other species.</p> <p>Investigate local invasive species</p>
Standard 2 <i>Students will understand that all organisms are composed of one or more cells that are made of molecules, come from preexisting cells, and perform life functions.</i>				

<p><b><u>Learning Targets</u></b></p> <p>1- Understand the relationship between the components and functions of the major macromolecules in cells.</p> <p>2- Describe the properties of water and its role in maintaining life.</p> <p>3- Describe the flow of energy and matter in cellular function.</p> <p>4- Describe the relationship between the organelles in a cell and the functions of that cell.</p> <p>5- Describe how the transport of materials in and out of cells enables cells to maintain homeostasis.</p>	<p><b><u>Academic Vocabulary</u></b></p> <p><b>organelles, photosynthesis, respiration, cellular respiration, osmosis, diffusion, active transport, homeostasis, cell theory, organic, carbohydrate, fermentation, protein, lipid, nucleic acid, enzyme, chlorophyll, cell membrane, nucleus, cell wall, solvent, solute, adhesion, cohesion, microorganism, mitosis</b></p>	<p><b><u>Questions Stems</u></b></p> <p><b>How do trend diets influence metabolism and homeostasis?</b></p> <p><b>How do slugs do photosynthesis? Photosynthetic slugs</b>  <a href="https://drive.google.com/a/washk12.org/file/d/0B9jSdo5Fws43ZnQwVkfWm2xNckU/view?usp=sharing">https://drive.google.com/a/washk12.org/file/d/0B9jSdo5Fws43ZnQwVkfWm2xNckU/view?usp=sharing</a></p> <p><b>Why has life expectancy increased since the discovery of the cell?</b></p>	<p><b><u>Possible Assessments</u></b></p> <p><b>Murder Mystery Macromolecule Lab Water Lab Macromolecule Foldable Candy Atoms Photosynthesis/respiration Lab Osmosis/diffusion lab</b></p> <p><b>Cell analogy project Water Lab Edible Cell Model Build Your DNA project</b></p>	<p>Model bond types</p> <p>DOK 3 Know how pH and temperature affect enzyme and enzyme process.</p> <p>DOK 4 Interpreting data -Lab activity with enzymes Design enzyme experiment Organize/Compare macromolecule structure</p> <p>DOK 3 Categorize the general steps of photosynthesis and respiration. Understand how the energy transfers through molecules</p>
<p><b>Standard 3 <i>Students will understand the relationship between structure and function of organs and organ systems.</i></b></p>				
<p><b><u>Learning Targets</u></b></p> <p>1- Understand the relationship of human organs and organ systems in maintaining homeostasis.</p>	<p><b><u>Academic Vocabulary</u></b></p> <p><b>organ, organ system, organism, hormonal modification, stomata, tissue, homeostasis, structure,</b></p>	<p><b><u>Questions Stems</u></b></p> <p><b>How does your digestive system compare to that of a plant?</b></p> <p><b>How do organ malfunctions affect</b></p>	<p><b><u>Possible Assessments</u></b></p> <p><b>Comparative Anatomy Dissections</b></p> <p><b>Plant Lab</b></p>	<p>DOK 2 Investigate the cause and effect between organ function and health</p>

<p>2- Understand the relationship of plant organs and plant systems in maintaining homeostasis.</p> <p>3- Compare the structure and function of organ systems in one organism to the structure and function in another organism</p>	<p><b>function</b></p>	<p><b>homeostasis?</b></p> <p><b>Why do some organs repair themselves and some do not?</b></p>	<p><b>Plant Dissection Lab Systems presentations comparative anatomy</b></p>	<p>disorders.</p> <p>Investigate technological advances in relation to artificial organs.</p>
<p><b>Standard 4</b> <i>Students will understand that genetic information coded in DNA is passed from parents to offspring by sexual and asexual reproduction. The basic structure of DNA is the same in all living things. Changes in DNA may alter genetic expression.</i></p>				
<p><b><u>Learning Targets</u></b></p> <p>1- Compare/contrast mitosis and meiosis and their role in reproduction.</p> <p>2- Describe patterns of inheritance.</p> <p>3- Explain how the structure and replication of DNA are essential to heredity and protein synthesis.</p> <p>4- Analyze bioethical issues and consider the role of science in determining public policy.</p>	<p><b><u>Academic Vocabulary</u></b></p> <p><b>DNA, replication, fertilization, dominant trait, recessive trait, genetic engineering, gene splicing, phenotype, genotype, sexual reproduction, asexual reproduction, chromosome, gene, mutation, cloning, inheritance, bioethics, pedigree, meiosis</b></p>	<p><b><u>Questions Stems</u></b></p> <p><b>What is the difference in identical twins and fraternal twins?</b></p> <p><b>Are all mutations bad?</b></p> <p><b>Why do some siblings look very similar and others do not?</b></p> <p><b>Why do some traits skip generations?</b></p>	<p><b><u>Possible Assessments</u></b></p> <p><b>Pedigrees</b>  <b>Mitosis Foldable</b>  <b>Mr. Potatoe Lab for Genetics</b>  <a href="https://docs.google.com/document/d/1I3Ma6pgtO_p eRxqPCpvfyhukA29XdOR mm2NgYKvEh9E/edit">https://docs.google.com/document/d/1I3Ma6pgtO_p eRxqPCpvfyhukA29XdOR mm2NgYKvEh9E/edit</a></p>	<p>I can critique the use of artificial selection in modern day agriculture. GMO's</p> <p>Bioethical Debates. (ie. designer babies, clones, stem cell research, GMO patenting, xenotransplantation, biological weapons)</p> <p>DOK 3</p> <p>Model the phases of meiosis</p>
<p><b>Standard 5</b> <i>Students will understand that biological diversity is a result of evolutionary processes.</i></p>				
<p><b><u>Learning Targets</u></b></p> <p>1- Relate principles of evolution to biological diversity.</p>	<p><b><u>Academic Vocabulary</u></b></p> <p><b>evolution, fossil record, geologic record, molecular, homologous, vestigial</b></p>	<p><b><u>Questions Stems</u></b></p> <p><b>Why do humans have tail bones?</b>  <b>Why do we have wisdom teeth?</b></p>	<p><b><u>Possible Assessments</u></b></p> <p><b>Make your own dichotomous key activity</b></p>	<p>DOK 4</p> <p>Using data from charts and graphs, analyze and predict the outcome of food supply</p>

<p>2- Cite evidence for changes in populations over time and use concepts of evolution to explain these changes.</p> <p>3- Classify organisms into a hierarchy of groups based on similarities that reflect their evolutionary relationships.</p>	<p><b>structures, mutation, recombination, hierarchy, classification scheme, theory, natural selection, adaptation, evidence, inference, speciation, biodiversity, taxonomy, kingdom, virus, protist, fungi, plant, animal, dichotomy</b></p>	<p><b>Whales have pelvic bones? Snakes have legs?</b></p> <p><b>How does the environment influence change in populations?</b></p> <p><b>Can a trait disappear from a population?</b></p>	<p><b>Make a shoe dichotomous key</b></p> <p><b>Chocolate Bar Cladogram</b>  <a href="https://drive.google.com/drive/folders/0B9jSdo5Fws43aWh3eWFwcWVQbkU">https://drive.google.com/drive/folders/0B9jSdo5Fws43aWh3eWFwcWVQbkU</a></p>	<p>and its effect on allele frequency.</p> <p>DOK 3 Use Hardy-Weinberg to draw conclusions on the effect of allele frequencies</p> <p>DOK 4 Apply and expand classification concepts to the different domains of life</p> <p>Use data to design and construct a phylogenetic tree or cladogram</p>
<p><i>ILOs or Intended Learning Outcomes</i></p>				
<p><b><u>Learning Targets</u></b>  <b>By the end of this course students should be able to...</b></p> <p>1- Use Science Process and Thinking Skills  2- Manifest Scientific Attitudes and Interests  3- Demonstrate Understanding of Science Concepts, Principles and Systems  4- Communicate Effectively Using Science Language and Reasoning  5- Demonstrate Awareness of Social and Historical Aspects of Science  6- Demonstrate Understanding of the Nature of Science</p>	<p><b><u>Academic Vocabulary</u></b></p> <p><b>generalize, conclude, hypothesis, theory, variable, measure, evidence, data, inference, infer, compare, predict, interpret, analyze, relate, calculate, observe, describe, classify, technology, experiment, investigation, tentative, assumption, ethical, replicability, precision, skeptical, methods of science</b></p>	<p><b><u>Question Stems</u></b></p> <p><b>How do you know if a source is reliable?</b></p> <p><b>Does peer review really matter?</b></p>	<p><b><u>Possible Assessments</u></b></p> <p><b>Independent vs. Dependent Variables</b>  <a href="https://drive.google.com/drive/folders/0B9jSdo5Fws43YkITd1IXV1A4V2c">https://drive.google.com/drive/folders/0B9jSdo5Fws43YkITd1IXV1A4V2c</a></p> <p><b>Graphing Practice</b>  <a href="https://drive.google.com/drive/folders/0B9jSdo5Fws43YkITd1IXV1A4V2c">https://drive.google.com/drive/folders/0B9jSdo5Fws43YkITd1IXV1A4V2c</a></p>	<p>Students are able to integrate technology and use Google to design graphs from the data obtained from my environment.</p>

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