



Cyberarts Studio Academy

Valrie Wauchope, Principal ♦ Jamin Harris, Assistant Principal
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Biology Curriculum Calendar

Fall Semester

Dates	#Days	Unit Title/ Due Dates / Essential Questions/ Instructional Objective	Core Content & NG Standards	Learning Target	Resources/Materials / Assessments
	6-7 weeks	UT: Marathon Runner (Homeostasis and Feedback Mechanisms in Humans) DD: Unit Essential Question: How does the human body maintain dynamic equilibrium and respond to internal and external changes in its environment?	Core Content: Gas Exchange, Cellular Respiration, Thermoregulation, Diffusion & Osmosis NG Standards: HS-LS1-2 HS-LS1-3 HS-LS1-7	1. Gas Exchange & Cellular Respiration "I can develop and use a model to show how body systems work together to support gas exchange and cellular respiration." "I can explain cellular respiration as a process that transfers energy by breaking down food and oxygen into energy, carbon dioxide, and water." 2. Muscles & Energy "I can plan and conduct an investigation to gather evidence of how feedback mechanisms help maintain energy balance (e.g., examining pulse rate,	Resources: New Visions Assessment: <ul style="list-style-type: none"> - Each section has a quiz on what they learned for that week(ish) - Each unit ends with a unit test that comprises of all the information that is found on



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				<p>breathing rate, or CO₂ output during exercise).”</p> <p>“I can create and interpret an input-output model for muscle cells that shows how energy (ATP) is produced and used at rest versus during exercise.”</p> <p>3. Blood Glucose Regulation</p> <p>“I can investigate and model how blood glucose is regulated in the body, including how feedback mechanisms (like insulin release) help maintain homeostasis.”</p> <p>“I can explain how energy is stored and used—distinguishing between glycogen, lipids, and glucose during long-duration activity.”</p> <p>4. Thermoregulation</p> <p>“I can investigate how the body responds to temperature changes and explain how feedback mechanisms (e.g., sweating, blood flow adjustments) help maintain stable internal conditions.”</p> <p>5. Water Balance & Dehydration</p>	<p>quizzes and from labs/ classwork activities</p> <ul style="list-style-type: none">- Homework is assigned 3-4 times a week to asses what the students are learning- Exit tickets almost daily to check for understanding
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				<p>“I can investigate water balance in the body and explain why maintaining proper salt concentration is essential—such as what happens when someone drinks too much plain water and risks hyponatremia.”</p> <p>“I can compare different hydration strategies (plain water vs. sports drinks) and describe their effects on the body’s osmotic balance.”</p> <p>6. Unit Closure – Making Sense of the Phenomenon</p> <p>“I can use evidence from my investigations to build a multi-system model that explains why the marathon runner became disoriented and collapsed.”</p> <p>“I can write an explanation that links feedback mechanisms across systems (e.g., respiratory, circulatory, thermoregulatory, and hydration) to what happened to the runner.”</p>	
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				<p>"I can propose safety recommendations (such as hydration guidelines) to help prevent similar collapses in the future."</p>	
	6-7 weeks	<p>UT: Humans vs. Bacteria (Natural Selection and Evolution) DD: Unit Essential Question: How has evolution shaped how humans and bacteria interact? How can we prevent future outbreaks of bacterial infections?</p>	<p>Core Content: The Black Death, Antibiotic Resistance, The Microbiome, Cooperation and Survival</p> <p>NG Standards: HS-LS4-2, HS-LS4-3, HS-LS4-4, HS-LS4-5, HS-LS2-8</p>	<p>1. Introduction to Bacteria and Pathogens</p> <p>"I can describe the structure of bacteria and how bacteria differ from human cells."</p> <p>"I can explain the role of bacteria in health and disease, including the difference between pathogenic and non-pathogenic bacteria."</p> <p>2. The Immune System Response</p> <p>"I can identify and describe the key components of the human immune system (e.g., white blood cells, antibodies, and the lymphatic system)."</p> <p>"I can explain how the body's immune system responds to bacterial infections using both the innate and adaptive immune systems."</p> <p>"I can illustrate the process of phagocytosis and how white blood cells engulf and destroy pathogens."</p>	<p>Resources:</p> <p>Assessment:</p> <ul style="list-style-type: none"> - Each section has a quiz on what they learned for that week(ish) - Each unit ends with a unit test that comprises of all the information that is found on quizzes and from labs/ classwork activities - Homework is assigned 3-4 times a week to asses what the



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				<p>3. Infection and Disease</p> <p>“I can explain how bacteria cause infections and describe the different ways they can harm the body (e.g., toxins, cell damage).”</p> <p>“I can compare and contrast bacterial and viral infections and explain why some bacteria are resistant to antibiotics.”</p> <p>4. Antibiotic Resistance</p> <p>“I can explain the concept of antibiotic resistance and how bacteria evolve to survive treatment.”</p> <p>“I can analyze case studies where bacteria became resistant to antibiotics and discuss the implications for public health.”</p> <p>5. Vaccines and Prevention</p> <p>“I can explain how vaccines work to prevent bacterial and viral infections by training the immune system.”</p>	<p>students are learning</p> <ul style="list-style-type: none">- Exit tickets almost daily to check for understanding
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				<p>"I can describe the process of creating and administering vaccines to protect against bacterial diseases."</p> <p>6. Human vs. Bacteria – Investigating a Real-World Scenario</p> <p>"I can investigate a real-world example of a bacterial infection outbreak (e.g., tuberculosis, MRSA) and explain how the immune system responds to the infection."</p> <p>"I can propose strategies for preventing the spread of bacterial infections in a community, such as hygiene practices, vaccination, and antibiotic stewardship."</p>	
	6-7 weeks	<p>UT: Evolution of Sick Humans DD: Unit Essential Question: How have our environments and culture changed over time? How have</p>	<p>Core Content: Lactase Persistence, Leptin Resistance, Circadian Rhythms, Common Ancestry</p>	<p>1. Introduction to Evolution and Disease</p> <p>"I can explain the basic principles of evolution by natural selection and how it leads to changes in populations over time."</p> <p>"I can describe how genetic mutations occur and how some mutations can offer an advantage in survival, while others may cause diseases."</p>	<p>Resources:</p> <p>Assessment:</p> <ul style="list-style-type: none"> - Each section has a quiz on what they learned for that week(ish)



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		<p>these changes impacted our health?</p>	<p>NG Standards: HS-LS1-1, HS-LS3-1, HS-ETS1-2, HS-ETS1-3, HS-LS4-1</p>	<p>2. Human Genetics and Inheritance</p> <p>“I can explain how traits are inherited through generations and how genetic disorders like sickle cell anemia are passed down.”</p> <p>“I can use Punnett squares to predict the inheritance of genetic traits, including genetic diseases.”</p> <p>3. Sickle Cell Anemia and Malaria Resistance</p> <p>“I can explain how sickle cell anemia, a genetic disorder, provides a selective advantage in regions where malaria is common.”</p> <p>“I can compare the evolutionary advantages and disadvantages of genetic mutations, using sickle cell anemia and malaria resistance as examples.”</p> <p>“I can describe how natural selection has led to higher frequencies of certain genetic mutations in populations exposed to specific diseases.”</p>	<ul style="list-style-type: none"> - Each unit ends with a unit test that comprises of all the information that is found on quizzes and from labs/ classwork activities - Homework is assigned 3-4 times a week to asses what the students are learning - Exit tickets almost daily to check for understanding
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				<p>4. Genetic Mutations and Evolutionary Trade-offs</p> <p>“I can analyze the concept of evolutionary trade-offs, where a mutation that confers a survival advantage against one disease may result in a disadvantage against another condition.”</p> <p>“I can evaluate the impact of mutations like those that cause cystic fibrosis, Huntington’s disease, or hemophilia on human health and evolutionary fitness.”</p> <p>5. Co-Evolution of Humans and Pathogens</p> <p>“I can describe how human populations and pathogens (e.g., bacteria, viruses) evolve in response to each other, leading to changes in both humans and diseases over time.”</p> <p>“I can explain how the evolution of antibiotic resistance in bacteria impacts human health and the ongoing struggle between human defenses and evolving pathogens.”</p>	
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				<p>6. Real-World Applications – Disease and Evolution</p> <p>“I can use evidence from real-world examples (e.g., malaria, tuberculosis, HIV) to explain how human populations evolve in response to infectious diseases.”</p> <p>“I can propose strategies for public health based on the principles of evolution, such as vaccination programs and the management of antibiotic resistance.”</p> <p>7. Ethical Considerations in Genetic Engineering</p> <p>“I can discuss the ethical implications of genetic engineering and gene therapy in humans, considering both potential benefits and risks.”</p> <p>“I can evaluate how genetic engineering could alter the evolutionary trajectory of humans and other species.”</p>	
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	<p>6-7 weeks</p>	<p>UT: Saving the Mountain Lion (Genetics and Variation) DD: Unit Essential Question: How can we save the mountain lion?</p>	<p>Core Content: Mountain Lion Population, Sexual Reproduction (optional), Genetic Variation, Engineering Gene Flow</p> <p>NG Standards: HS-LS3-2, HS-LS1-8, HS-LS1-4, HS-LS4-3, HS-LS3-3</p>	<p>1. Introduction to Species Conservation</p> <p>“I can describe what it means for a species to be endangered and identify factors that contribute to a species becoming endangered.”</p> <p>“I can explain the importance of preserving biodiversity and the role of keystone species like the mountain lion in an ecosystem.”</p> <p>2. Population Dynamics and Ecosystems</p> <p>“I can describe the concept of an ecosystem and explain how populations of species interact with each other and with their environment.”</p> <p>“I can explain how factors like food availability, habitat size, and human intervention affect the population size and survival of a species.”</p> <p>“I can interpret population data to determine if a species’ population is stable, increasing, or decreasing over time.”</p>	<p>Resources:</p> <p>Assessment:</p> <ul style="list-style-type: none"> - Each section has a quiz on what they learned for that week(ish) - Each unit ends with a unit test that comprises of all the information that is found on quizzes and from labs/ classwork activities - Homework is assigned 3-4 times a week to asses what the students are learning
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				<p>3. Human Impact on Ecosystems</p> <p>“I can explain how human activities like urban development, hunting, and deforestation impact species like the mountain lion.”</p> <p>“I can identify the role of habitat fragmentation in limiting the movement of species and reducing genetic diversity.”</p> <p>“I can describe how roads and other human-made barriers can disrupt animal migration patterns and affect survival.”</p> <p>4. Conservation Strategies</p> <p>“I can investigate and evaluate conservation strategies that have been used to protect endangered species, including habitat restoration and wildlife corridors.”</p> <p>“I can describe the role of conservation laws, wildlife protection programs, and endangered species lists in the protection of species like the mountain lion.”</p>	<p>- Exit tickets almost daily to check for understanding</p>
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				<p>“I can propose a conservation plan for saving the mountain lion, including specific actions and strategies to address key threats.”</p> <p>5. Ecological Relationships and Food Webs</p> <p>“I can explain how the mountain lion fits into its food web and why its role as an apex predator is critical to maintaining balance in its ecosystem.”</p> <p>“I can analyze the impact of removing an apex predator like the mountain lion on the overall health of an ecosystem.”</p> <p>6. Real-World Problem Solving – Applying Knowledge</p> <p>“I can synthesize scientific data and propose a plan to address the challenges facing the mountain lion, using evidence-based reasoning to support my ideas.”</p> <p>“I can communicate a scientific argument for the importance of protecting</p>	
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				endangered species and ecosystems to a broader audience.”	
	6-7 weeks	<p>UT: Food for All (Energy and Matter in Ecosystems) DD: Unit Essential Question: What caused an epidemic of pellagra in the early 20th century?</p>	<p>Core Content: Neolithic Revolution, The SuperFood That Changed The World, Infectious Agent or Insufficient Diet, Food For Plants NG Standards: HS-LS2-1, HS-LS1-5, HS-LS2-4, HS-LS2-3, HS-LS1-6</p>	<p>1. Introduction to Food Systems and Sustainability</p> <p>“I can describe how food systems work from production to consumption, including agriculture, transportation, and distribution.”</p> <p>“I can explain the difference between sustainable and unsustainable food practices and how these affect both the environment and human health.”</p> <p>“I can identify the environmental, economic, and social factors that influence food production and distribution.”</p> <p>2. The Science of Agriculture and Food Production</p> <p>“I can explain the role of agriculture in providing food for humans and how different farming methods (e.g., industrial agriculture vs. organic farming) impact food production and sustainability.”</p>	



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				<p>“I can identify the main crops and animals that are critical to the global food supply, including the impact of monoculture farming.”</p> <p>“I can describe the biological processes involved in plant growth, including photosynthesis, nutrient uptake, and soil health, and how these processes affect crop yields.”</p> <p>3. Challenges in Food Production and Global Hunger</p> <p>“I can analyze the causes of food insecurity, including poverty, climate change, and unequal distribution of resources.”</p> <p>“I can explain the concept of food deserts and how lack of access to nutritious food affects public health.”</p> <p>“I can describe how climate change, water scarcity, and land degradation impact global food production and threaten food security.”</p>	
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				<p>4. Genetically Modified Organisms (GMOs) and Biotechnology</p> <p>“I can explain what genetically modified organisms (GMOs) are, how they are created, and the potential benefits and risks associated with their use in food production.”</p> <p>“I can evaluate the role of biotechnology in addressing global food challenges, including increasing crop yields and improving disease resistance.”</p> <p>“I can analyze the ethical, environmental, and health concerns surrounding the use of GMOs in agriculture.”</p> <p>5. Food and Human Health</p> <p>“I can explain the relationship between food choices, nutrition, and human health, and how diet impacts diseases such as obesity, diabetes, and heart disease.”</p> <p>“I can analyze the impact of processed foods, added sugars, and unhealthy fats on public health and the global burden of disease.”</p>	
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				<p>“I can discuss how cultural and socioeconomic factors influence food choices and dietary patterns around the world.”</p> <p>6. Sustainable Solutions and Innovations in Food Systems</p> <p>“I can propose sustainable agricultural practices that can help improve food production while minimizing environmental impact, such as crop rotation, permaculture, and agroforestry.”</p> <p>“I can explain how innovations like vertical farming, aquaponics, and lab-grown meat may contribute to solving food security challenges in urban environments.”</p> <p>“I can discuss how reducing food waste, improving food distribution, and supporting local food systems can help address food scarcity and inequality.”</p> <p>7. Global Perspectives on Food Security</p> <p>“I can analyze food systems in different parts of the world and explain how social,</p>	
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				<p>political, and economic factors influence food security in various countries.”</p> <p>“I can evaluate the role of international organizations (e.g., the United Nations, World Food Programme) in addressing global hunger and food security challenges.”</p> <p>“I can discuss how policies related to trade, subsidies, and agricultural practices impact food security and inequality on a global scale.”</p>	
	6-7 weeks	<p>UT: Woolly Mammoth (Ecology and Human Impact) DD: Unit Essential Question: What caused the woolly mammoth to go extinct? Should we bring the woolly mammoth back?</p>	<p>Core Content: Tuskless Elephants, Coral Bleaching, Kelp Forest, Passenger Pigeon</p> <p>NG Standards: HS-LS2-7, HS-LS4-6,</p>	<p>1. Introduction to Extinction and Evolution</p> <p>“I can explain what extinction is and identify the factors that contribute to the extinction of species.”</p> <p>“I can describe the process of natural selection and how it influences the evolution of species over time.”</p> <p>2. The Woolly Mammoth’s Ecology and Evolution</p> <p>“I can describe the physical characteristics of the woolly mammoth</p>	<ul style="list-style-type: none"> - Each section has a quiz on what they learned for that week(ish) - Each unit ends with a unit test that comprises of all the information that is found on quizzes and from labs/ classwork activities



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			<p>HS-LS2-2, HS-LS2-5, HS-LS2-6</p>	<p>and explain how these traits helped it survive in cold environments.”</p> <p>“I can explain the role of the woolly mammoth in its ecosystem, particularly in relation to other species and the environment during the Pleistocene Epoch.”</p> <p>“I can compare the woolly mammoth to its modern relatives, the elephant, and explain their evolutionary relationship.”</p> <p>3. Causes of Extinction</p> <p>“I can identify and explain the main factors that may have contributed to the extinction of the woolly mammoth, including climate change and human activity.”</p> <p>“I can evaluate the role of overhunting, habitat loss, and climate change in the extinction of the woolly mammoth.”</p> <p>“I can analyze how environmental changes during the end of the Ice Age might have contributed to the woolly mammoth's decline.”</p>	<ul style="list-style-type: none">- Homework is assigned 3-4 times a week to asses what the students are learning- Exit tickets almost daily to check for understanding
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				<p>4. De-Extinction and Genetic Engineering</p> <p>“I can explain the concept of de-extinction and the scientific approaches being used to bring back extinct species like the woolly mammoth.”</p> <p>“I can describe how scientists are using genetic technology (e.g., cloning and CRISPR) to attempt to revive the woolly mammoth or create a hybrid species.”</p> <p>“I can evaluate the ethical, ecological, and biological implications of de-extinct species, including how bringing back the woolly mammoth might impact modern ecosystems.”</p> <p>5. The Role of Technology in Studying Extinct Species</p> <p>“I can explain how genetic sequencing and fossil analysis are helping scientists learn more about extinct species like the woolly mammoth.”</p> <p>“I can evaluate the benefits and limitations of using ancient DNA to study</p>	
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				<p>extinct organisms and understand their biology.”</p> <p>6. Human Impact on Extinction</p> <p>“I can analyze the impact of human activity on species extinction, using the woolly mammoth as an example of how early humans may have contributed to the decline of a species.”</p> <p>“I can compare the extinction of the woolly mammoth with other extinct species (e.g., saber-toothed cats, dodo birds) and discuss the factors that led to their disappearance.”</p> <p>7. Ethical and Ecological Considerations</p> <p>“I can discuss the ethical considerations involved in efforts to resurrect extinct species, considering the potential consequences for biodiversity, ecosystems, and animal welfare.”</p> <p>“I can argue whether de-extinction is a worthwhile pursuit based on ecological, ethical, and scientific considerations.”</p>	
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