

**General Brown Central School District  
Curriculum Map**

<p>Course Title: <b>LIVING ENVIRONMENT</b></p>	<p>Prepared By: LISA FOWLER</p>
<p>Time Frame: 15-20 days</p>	<p>Unit/Theme Unit 1: Characteristics of Living Things</p>
<p><b>All living things share a set of unique characteristics and processes that define life. While reviewing basic laboratory and microscopy techniques, students will explore the similarities and differences between cell types. Deeply investigating different domains and kingdoms of life allows for an introduction to the history of life on Earth, common ancestry, and evolution, which are key concepts spiraled throughout the remainder of the course.</b></p> <p>Essential Questions:          What makes things living?          How can we differentiate between life and non-life?          How are living things both similar to and different from each other?          How can we use evidence to understand the evolution of life on Earth?</p>	
<p>NYS Standards:          HS-LS4-1          9-10.R.ST.2          9-10.R.ST.3          9-10.R.ST.9          9-10.W.HST.10</p>	<p>Vocabulary:          Biotic, abiotic, organism, homeostasis, cells, inorganic/organic, reproduce, evolve/evolution, heredity, stimulus, virus, cell, micrograph, kingdoms (of life), domains, eukaryotes/eukaryotic, prokaryotes/prokaryotic, organelles (DNA, cytoplasm, nucleus, plasma/cell membrane, ribosomes, mitochondria, chloroplast, vacuole, cell wall, flagellum), iodine, unicellular/multicellular, endosymbiotic theory, tissue/organ/organ system, amoeba</p>
<p>Student Objectives (The student will know...):</p> <ul style="list-style-type: none"> <li>⑩ Living things have certain characteristics-ability to reproduce, use of energy, response to stimuli, etc.</li> <li>⑩ All living things are made up of cells. There are structures that all cells have in common, and also differences between different types of cells.</li> <li>⑩ The similarities among living things can be traced to their common history on Earth.</li> </ul>	
<p>Assessments:          History of Life Performance Task (Characteristics of Life, Cell Theory)          Quizzes          NY State Regent Exam based test          CastleLearning Assignments          Labs:              1. Cell Comparison</p>	

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<p>Recommended Texts: Assorted Science Literacy Articles</p>	<p>Resources: Teacher developed PPT and notes Biology Textbook (Miller and Levine) TestWizard CastleLearning Unit 1 Regents Item Bank – NewVisions.org</p>
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<p>Course Title: <b>LIVING ENVIRONMENT</b></p>	<p>Prepared By: Lisa Fowler</p>
<p>Time Frame: 25-30 days</p>	<p>Unit/Theme Unit 2: Nutrients, Energy and Biochemistry</p>
<p><b>Food that humans eat are made of complex macromolecules that are broken down, transported, and rebuilt through the actions of physical and chemical changes. In this unit, students will investigate the contents of different foods, the breakdown of those foods through digestion, and the ways in which body systems supply nutrients and energy to cells. Students practice carrying out experiments to test biochemical processes including digestion and respiration, and they will design experiments by manipulating variables and posing questions.</b></p> <p>Essential Questions:            What kinds of food do humans need to consume in order to have a healthy diet?            Are there different ways to create a healthy diet?            How do substances move into and out of cells?            How is food broken down and used by the body to fuel life processes?            How do plants generate their own food?            How does food provide energy for life processes?</p>	
<p>NYS Standards:            HS-LS1-5            HS-LS1-6.6            HS-LS1-7            9-10.R.ST.2            9-10.R.ST.3            9-10.R.ST.9            9-10.W.HST.10</p>	<p>Vocabulary:            Photosynthesis, molecules, atoms, bonds, glucose, carbon dioxide, oxygen, water, chloroplast, chlorophyll, light energy, carbohydrates, producer/autotroph, consumer/heterotroph, food chain, sugar, adenosine triphosphate (ATP), mitochondrion, cellular respiration, aerobic, anaerobic, nutrients, macromolecules, protein, starch, iodine, building blocks, amino acid, monomer/polymer, lipids, fats, oils, fatty acid, glycerol, indicator, semipermeable, selectively permeable, concentration gradient, diffusion, passive/active transport, calories, calorimetry, protein channel, osmosis, acidic, basic, pH, enzyme, catalyst/catalyze, substrate, lock and key model,</p>

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	reaction rate, active site, binding, denature, hydrogen peroxide, lysosome, digestion
<p>Student Objectives (The student will know...):</p> <ul style="list-style-type: none"> <li>⑩ Only producers synthesize organic molecules from raw materials, but all organisms use these molecules to do respiration.</li> <li>⑩ Macronutrients are assembled in the cell using pieces that are broken down during digestion.</li> <li>⑩ For cellular processes to occur the right molecules need to be in the right place.</li> </ul>	
<p>Assessments:</p> <p>Anchor Phenomenon: Diverse Diets, Eating Crickets</p> <p>Performance Task: Crickets in Our Lunch??!</p> <p>Labs:</p> <ol style="list-style-type: none"> <li>1. Cellular Respiration and Experimental Design</li> <li>2. Diffusion Across a Membrane</li> <li>3. Enzyme Activity Lab</li> </ol>	<p>Quizzes</p> <p>NYS Regents based exam</p>
<p>Recommended Texts:</p> <p>Assorted Science Literacy Articles</p>	<p>Resources:</p> <p>Teacher developed PPT and notes</p> <p>Biology Textbook (Miller and Levine)</p> <p>TestWizard</p> <p>CastleLearning</p> <p>Unit 2 Regents Item Bank – NewVisions.org</p>

<p>Course Title:</p> <p><b>LIVING ENVIRONMENT</b></p>	<p>Prepared By:</p> <p>Lisa Fowler</p>
<p>Time Frame:</p> <p>20-25 days</p>	<p>Unit/Theme</p> <p>Unit 3: Homeostasis in Human Body Systems</p>
<p><b>Humans are complex organisms that maintain a narrow set of internal conditions through a system of feedback and communication mechanisms between multiple organ systems. In this unit, students will explore how body systems interact to effectively monitor and respond to both internal and external environmental changes. Students complete both Making Connections (NYS required lab) and a human thermoregulation laboratory, both of which focus on skills of experimental design.</b></p> <p>Essential Questions:</p> <p>How does a human body respond to internal and external changes in its environment?</p> <p>How do body systems interact to maintain a dynamic equilibrium?</p>	
<p>NYS Standards:</p> <p>HS-LS1-3</p> <p>HS-LS1-2</p> <p>9-10.R.ST.2</p> <p>9-10.R.ST.3</p> <p>9-10.R.ST.9</p>	<p>Vocabulary:</p> <p>Cell, tissue, organ, organ system, homeostasis, dynamic equilibrium, feedback mechanism, stimulus, response, metabolic/metabolism, insulin, glycogen, carbohydrates, proteins, small intestine, hormone, target cell/organ, circulation,</p>

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9-10.W.HST.10	coordination, digestion, bias, conclusion, observation, control, control group, data, dependent variable, experimental design, experimental group, hypothesis, independent variable, peer feedback, peer review, problem, results, synthesis
<p>Student Objectives (The student will know...):</p> <ul style="list-style-type: none"> <li>⑩ The human body contains multiple organ systems that function to maintain biological processes.</li> <li>⑩ Human body systems interact to maintain a stable internal environment.</li> <li>⑩ Feedback mechanisms enable the human body to respond to internal and external stimuli.</li> <li>⑩ As a species, humans have adapted to diverse environmental conditions.</li> </ul>	
<p>Assessments: Anchor Phenomenon: Marathon Runner Collapse! Performance Task: Marathon Runner Problem Quiz NYS Regents-based exam</p> <p>Labs: 1. Human Thermoregulation 2. Making Connections (NYS required lab)</p>	
<p>Recommended Texts: Assorted Science Literacy Articles</p>	<p>Resources: Teacher developed PPT and notes Biology Textbook (Miller and Levine) TestWizard CastleLearning Unit 3 Regents Item Bank – NewVisions.org</p>

<p>Course Title: <b>LIVING ENVIRONMENT</b></p>	<p>Prepared By: Lisa Fowler</p>
<p>Time Frame: 20-25 days</p>	<p>Unit/Theme Unit 4: Disease and Disruption of Homeostasis</p>
<p><b>The incidence of disease at different point in history, and in differnet communities, is affected by lifestyle, access to healthy infrastructure, emerging pathogens, and new treatments. In this unit students will explore both the disappearance of certain diseases thanks to antibiotics and vaccines, and the emergence or growth of other diseases. Accessing data from maps, graphs, and other non-print texts – and using that data to draw conclusions and ask further questions – is a key component to this unit.</b></p> <p>Essential Questions: Why are certain diseases prevalent in our community, while others have completely disappeared? Why do some diseases only affect old people or young people?</p>	

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<p>NYS Standards:          HS-LS1-2          HS-LS1-3          9-10.R.ST.2          9-10.R.ST.3          9-10.R.ST.9          9-10.W.HST.10</p>	<p>Vocabulary:          Phagocyte, engulf, white blood cell, pathogen, microbe, inflammation, enzymes, denature, mucus, secrete, virus/viral, immune response, T cells, helper T, killer T, B cells, plasma, memory, antigens, antibody, mutation, vaccine/vaccination, bacteria/bacterial, antibiotic, antibiotic resistance, variation, diabetes/diabetic, glucose, regulation, urinalysis, insulin, glucagon, pancreas, liver blood sugar, cancer, disease prevalence, immunodeficiency</p>
<p>Student Objectives (The student will know...):</p> <ul style="list-style-type: none"> <li>⑩ Two major causes of the disruption of homeostasis in human beings are:              Toxins: substances which, in excess, interfere with human body systems              Pathogens: living things that cause disease in the human body.</li> <li>⑩ The immune system fights disease.</li> <li>⑩ Disease may be prevented through vaccination, medical interventions, and lifestyle choices.</li> </ul>	
<p>Assessments:          Anchor Phenomenon: Prevalence of Diseases          Performance Task: Community Health PSA          Quiz          Regents-based exam          Labs:              1. Antibiotic Resistance Simulation              2. Urinalysis Lab</p>	
<p>Recommended Texts:          Assorted Science Literacy Articles</p>	<p>Resources:          Teacher developed PPT and notes          Biology Textbook (Miller and Levine)          TestWizard          CastleLearning          Unit 4 Regents Item Bank – NewVisions.org</p>

<p>Course Title:  <b>LIVING ENVIRONMENT</b></p>	<p>Prepared By:          Lisa Fowler</p>
<p>Time Frame:          18-25 days</p>	<p>Unit/Theme          Unit 5: Comparative Reproduction</p>
<p><b>Reproduction and development are necessary for the continuation of any species, and as such, all species have unique but related strategies for reproduction. In this unit, students learn about continuity and diversity of life in a variety of organisms, including humans, and use their findings to discern evolutionary relationships. Exploring print texts, visuals, and hands-on experiences, students compare the mechanisms through which different living things reproduce, with a focus on comparisons to human reproduction.</b></p> <p>Essential Questions:</p>	

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<p>Why do organisms have different types of reproductive strategies?          How can comparing reproductive strategies provide us with evidence for the evolution of all life?          How are humans uniquely suited for the reproductive demands of our species?</p>	
<p>NYS Standards:          HS-LS4-1          HS-LS3-2          HS-LS1-3          9-10.R.ST.2          9-10.R.ST.3          9-10.R.ST.9          9-10.W.HST.10</p>	<p>Vocabulary:          Eggs, salinity, osmoregulator, sexual reproduction, adaptation, natural selection, competition, predation, genetic diversity, enzymes, osmosis, internal/external development, meiosis, gametes, somatic, chromosomes, nucleus, sperm, hormones (estrogen, progesterone, testosterone, FSH, LH), reproductive structures, pollen, egg/sperm, fertilization, ovary, ovulation, menstrual cycle, uterus, testes, fallopian tube, vas deferens, common descent, embryo, common ancestor, vertebrate, environmental condition, placenta, vagina, umbilical cord, zygote, fetus, diffusion, substances, gas/nutrient/waste exchange, amniotic fluid, teratogen/toxin/carcinogen, differentiation, sexual reproduction, asexual reproduction, binary fission, genetic variation, mitosis, genetic clones, offspring, cladogram</p>
<p>Student Objectives (The student will know...):</p> <ul style="list-style-type: none"> <li>⑩ Cells make copies of their DNA and divide during growth, repair, and reproduction.</li> <li>⑩ In sexual reproduction, organisms produce sex cells that contain half of the genetic information of the parent cell.</li> <li>⑩ The development and health of a fetus is impacted by a variety of factors.</li> <li>⑩ Organisms are both similar and different to one another, providing evidence of both common descent and adaptation to environmental conditions.</li> </ul>	
<p>Assessments:          Anchor Phenomenon: Comparative Reproduction as Evidence of Evolution          Performance Task: Cladograms          Quiz          NYS Regents-based exam          Labs:              1. Brine Shrimp Hatching Success Lab              2. Flower Dissection Lab              3. Time for Mitosis Lab</p>	
<p>Recommended Texts:          Various Science Literacy Articles</p>	<p>Resources:          Teacher developed PPT and notes          Biology Textbook (Miller and Levine)          TestWizard          CastleLearning          Unit 5 Regents Item Bank – NewVisions.org</p>

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<p>Course Title: <b>LIVING ENVIRONMENT</b></p>	<p>Prepared By: Lisa Fowler</p>
<p>Time Frame: 20-28 days</p>	<p>Unit/Theme Unit 6: Genetics, Biotech, and Bioethics</p>
<p><b>DNA, as students learned earlier in the year, is found in all living things, and has a common role in heredity. In this unit, students investigate genetic processes including protein synthesis, inheritance, and gene expression. They then learn about modifications of these processes through the lens of genetic engineering, biotechnology, and natural selection. Students will investigate these concepts through background readings, interactive simulations, and hands-on experience with biotechnology labs analyzing DNA samples using gel electrophoresis.</b></p> <p>Essential Questions: What are the advantages and possible risks of using biotechnology approaches? How can biotechnology be used to identify relationships and conserve endangered species?</p>	
<p>NYS Standards: HS-LS4-1 HS-LS1-1 HS-LS3-1 HS-LS4-4 9-10.R.ST.2 9-10.R.ST.3 9-10.R.ST.9 9-10.W.HST.10</p>	<p>Vocabulary: Genetic material, traits, nucleus, DNA, chromosomes, gene, code, protein, allele/genotype/phenotype, expression, genetic relationships, nucleotides (ATCG), nucleic bases, complementary base pairing, phosphate-sugar backbone, double helix, chromatography, RNA, transcription, translation, protein synthesis, amino acid, trait, molecular, proteins/enzymes, DNA replication, mutations, gene expression, identical vs. fraternal twins, genetic variation, natural selection, adaptations, overproduction, speciation, biotechnology, DNA sequence, gel electrophoresis, restriction enzymes, DNA fragments, plasmid, clone, asexual reproduction, genetic modification, genetically modified organism, natural vs. artificial selection, selective breeding, biodiversity, physical vs. molecular, ecosystem</p>
<p>Student Objectives (The student will know...):</p> <ul style="list-style-type: none"> <li>⑩ The genetic information stored in DNA is used to direct the synthesis of proteins which determine an organism's traits.</li> <li>⑩ Heredity is the passage of genetic information from one generation to another.</li> <li>⑩ Technology allows for the analysis and modification of genetic information.</li> <li>⑩ Individuals and society must consider both the benefits and ramification of using biotechnology.</li> </ul>	
<p>Assessments:</p>	

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<p>Anchor Phenomenon: Biotechnology as a Tool for Conservation</p> <p>Performance Task: Conserving the Endangered <i>Botana curus</i></p> <p>Quiz</p> <p>NYS Regents-based Exam</p> <p>Labs:</p> <ol style="list-style-type: none"> <li>1. Relationships and Biodiversity (NYS required lab)</li> <li>2. DNA structure Lab</li> <li>3. Gel Electrophoresis Lab</li> </ol>	
<p>Recommended Texts:</p> <p>Various Science Literacy Articles</p>	<p>Resources:</p> <p>Teacher developed PPT and notes</p> <p>Biology Textbook (Miller and Levine)</p> <p>TestWizard</p> <p>CastleLearning</p> <p>Unit 6 Regents Item Bank – NewVisions.org</p>

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<p>Time Frame:</p> <p>20-28 days</p>	<p>Unit/Theme</p> <p>Unit 7: Ecosystems and Invasive Species</p>
<p><b>Energy flows and matter cycles among organisms, and between organisms and their environment, creating dynamic interconnected systems. In this unit, students learn about the biotic and abiotic factors in a river ecosystem, using the Hudson River as a case study. They then investigate the impact of an invasive species (zebra mussels) on this ecosystem, using teaching case materials created by scientists at the American Museum of Natural History. Students then make hypotheses about how the presence of zebra mussels might affect a specific biotic or abiotic factor. Finally, using data collected by the Cary Institute, students write scientific explanations confirming or rejecting their hypotheses, thus building an understanding of the role of data and collaboration in the scientific community.</b></p> <p>Essential Questions:</p> <p>In what way are organisms and their environment interdependent?</p> <p>How can altered ecosystems recover to a point of long-term stability?</p>	
<p>NYS Standards:</p> <p>HS-LS2-6</p> <p>HS-LS2-4</p> <p>HS-LS2-1</p> <p>HS-LS2-2</p> <p>9-10.R.ST.2</p> <p>9-10.R.ST.3</p> <p>9-10.R.ST.9</p> <p>9-10.W.HST.10</p> <p>9-10.W.HST.10</p>	<p>Vocabulary:</p> <p>ecosystem, biotic factor, abiotic factor, food chain, food web, energy arrows, symbiosis (mutualism, commensalism, parasitism), predator/prey, consumer/heterotroph, producer/autotroph, carnivore, herbivore, omnivore, primary/secondary/tertiary consumer, decomposer, saprovore, scavenger, competition, trophic level, energy pyramid, nutrients/resources, nutrient cycling, carbon,</p>



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	<p>nitrogen, energy loss, species, population, community, biomagnification, bioaccumulation, population dynamic, carrying capacity, dynamic equilibrium, interdependence, exponential growth, adaptation, co-evolution, competition, ecological succession, climax community, stability, stable ecosystem, biodiversity, invasive species, foreign species, native/non-native, invasive, interconnected, interdependent</p>
<p>Student Objectives (The student will know...):</p> <ul style="list-style-type: none"> <li>• Ecosystems are made up of living and nonliving things that interact in complex ways.</li> <li>• A single change to an ecosystem can affect all different parts of that ecosystem. Eventually, the ecosystem will get to a new equilibrium.</li> </ul>	
<p>Assessments: Anchor Phenomenon: Zebra Mussel Invasion Performance Task: Hudson River Ecology Quiz Reading assignments NYS Regents-base exam Labs: 1. Bottle Biology Lab 2. Water Testing 3. Deer: Predation</p>	
<p>Recommended Texts: Various Science Literacy Articles</p>	<p>Resources: Teacher developed PPT and notes Biology Textbook (Miller and Levine) TestWizard CastleLearning Unit 7 Regents Item Bank- NewVisions.org</p>

<p>Course Title: <b>LIVING ENVIRONMENT</b></p>	<p>Prepared By: Lisa Fowler</p>
<p>Time Frame: 21-26 days</p>	<p>Unit/Theme Climate Change and Human Impact</p>
<p><b>Human population growth, globalization, and industrialization are having profound impacts on the long term health and stability of ecosystems, permanently altering the products of billions of years of evolutionary history on planet Earth. In this unit, students create plans to address the population decline of endangered species, gaining a greater understanding of how humans have altered ecosystems and what actions may be taken (including the use of biotechnology) to preserve biodiversity. Students create models and utilize simulations to gain a deeper understanding of large scale geological and biological processes.</b></p>	

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<p>Essential Questions: How are human activities altering the physical and living environment? Is it possible to save species from extinction?</p>	
<p>NYS Standards: HS-LS4-1 HS-LS4-2 HS-LS4-4 HS-LS4-5 HS-LS2-2 HS-LS2-3 HS-LS2-4 HS-LS2-5 HS-LS2-8 HS-LS2-1 HS-LS2-2 HS-LS2-7 HS-LS4-6 9-10.R.ST.2 9-10.R.ST.3 9-10.W.HST.10 9-10.R.ST.9</p>	<p>Vocabulary: adapt, acclimate, tolerate, adaptation, natural selection, extinction, climate change, carbon/carbon dioxide, biosphere, geosphere, atmosphere, carbon cycle, greenhouse gases, climate, human population growth, renewable vs. nonrenewable, fossil fuels, biodiversity, conservation, keystone species,</p>
<p>Student Objectives (The student will know...):</p> <ul style="list-style-type: none"> <li>• Organisms have adaptations that enable them to survive in their environments.</li> <li>• A species can change, through evolution, but this takes a very long time.</li> <li>• Humans have extensive impact on ecosystems both because of the exponential growth of the human population, and because of humans' unsustainable use of resources.</li> </ul>	
<p>Assessments: Anchor Phenomenon: Human Impact Performance Task: Species Survival Plans Quiz NYS Regents-based exam Labs: 1. Beaks of Finches State Lab</p>	
<p>Recommended Texts:</p>	<p>Resources: Teacher developed PPT and notes Biology Textbook (Miller and Levine) TestWizard CastleLearning Unit 8 Regents Item Bank- newvisions.org</p>



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Time Frame:	Unit/Theme
Essential Questions:	
NYS Standards:	Vocabulary:
Student Objectives (The student will...):	
Assessments:	

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Recommended Texts:	Resources:

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Recommended Texts:	Resources: