

Course: Living Environment

Teacher(s): Raven Mena & Jennifer Bennett

Grade: 8th

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Course Overview

Welcome to the Living Environment course! This is a full year (two semesters) **high school** level course that will prepare you for the **New York State Regents Living Environment** exam in June. This class covers diverse subject matter associated with the NYS curriculum, and provides knowledge of several topics including ecology, biochemistry, evolution, molecular and human genetics, DNA technology, human physiology and human reproduction. In the lab you will have hands-on opportunities to practice and experiment with many of the concepts that you learn in class. Regents Biology is a rigorous course. **A significant amount of studying must be completed at home to allow time for discussion, labs, and inquiry during class time.** Living Environment is a course designed to provide us with authentic scientific experiences, and requires us to utilize our space as not only our classroom, but also as our collaboration center, research hub, and laboratory.

Materials Needed for Class:

- 3 subject Notebook
- 2-pocket folder
- Pencil

BUGS Proficiency Scale (General)

Rating Scale	Level of Mastery	Explanation of Mastery Levels
4.0	Exceeds Level 3 Expectation	Advanced: Clearly indicates knowledge and skills above Level 3 expectation.
3.5		Mastery with components of more complex concepts
3.0	Meets Expectations for Mastery	Proficient: Clearly demonstrates knowledge and skills that meet level 3 expectations for mastery
2.5		Knowledge and skills beyond the foundation. Moving towards proficiency in the standards required for mastery.
2.0	Approaching Grade Level	Progressing: Knowledge and skills of the foundational concepts of the standards required for mastery.
1.5		Evidence indicates growth in student knowledge and skills beyond beginning levels of understanding.
1.0	Far Below Grade Level	Beginning: Indicates beginning knowledge of standards and skills
0.0		Insufficient or no evidence

*****Lab Eligibility/Requirements/rules/procedures*****

The NYSED requires all students enrolled in laboratory based science class to complete 1,200 minutes of laboratory experiences. Students must submit the corresponding laboratory reports as evidence of satisfactory content mastery and task completion. This equates to approximately 30 labs.

All 30 lab reports must have a passing grade. If you fail to meet the minimum requirements, you will be prevented from taking the Living Environment Regents Examination in June.

The Living Environment course and Regents Exam are required to graduate with any New York State High School Diploma.

Timeframe	Units of Study	Unit Overview	Prioritized Standards to be Assessed
September -	<i>Characteristics of Living Things</i>	<ul style="list-style-type: none"> • <i>Characteristics of life</i> • <i>Cell Theory</i> • <i>History of life on Earth</i> • <i>Common Ancestry (Evolution of Species)</i> • <i>DNA</i> • <i>Respiration and photosynthesis</i> • <i>Dynamic equilibrium</i> 	HS-LS4-1. Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.
October -	<i>Unit 2: Nutrients, Energy, & Biochemical Processes</i>	<ul style="list-style-type: none"> • <i>Macronutrients assembly, breakdown, and transport</i> • <i>Respiration and photosynthesis</i> • <i>Human digestive system; enzymes</i> • <i>Cycles of matter and energy flow</i> • <i>Human circulatory system</i> • <i>Cell Theory and organelles</i> 	<p>HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.</p> <p>HS-LS1-6. 6. Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.</p>
November -	<i>Unit 3 : Homeostasis in Human Body Systems</i>	<ul style="list-style-type: none"> • <i>Interaction of all human body systems</i> • <i>Dynamic equilibrium and feedback</i> • <i>levels of organization in humans</i> • <i>human adaptations and comparison to other species (thermoregulation, water regulation, etc.)</i> • <i>toxins vs. pathogens causing disease</i> 	<p>HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.</p> <p>HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.</p>
December -	<i>Unit 4: Disease & Disruption of Homeostasis</i>	<ul style="list-style-type: none"> • <i>Causes of disease: pathogenic genetic, exposure to toxins, lifestyle</i> • <i>Treatment/prevention: vaccines, antibiotics, healthy choices</i> • <i>Mitosis and cell division/ replication</i> • <i>Antibiotic resistance and disease</i> • <i>Interaction of all human body</i> 	<p>HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.</p> <p>HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.</p>
January -	<i>Unit 5: Comparative Reproduction</i>	<ul style="list-style-type: none"> • <i>Mitosis and cell division/replication</i> • <i>Factors affecting reproduction and development</i> • <i>Asexual and sexual reproduction</i> • <i>Human adaptations and comparison to other species (asexual vs. sexual reproduction)</i> • <i>Genetics of asexual vs. sexual reproduction</i> 	<p>HS-LS4-1: Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.</p> <p>HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.</p> <p>HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.</p>
February -	<i>Unit 6: Genetics, Biotech, & Decision Making</i>	<ul style="list-style-type: none"> • <i>structures and mechanisms of genetics</i> • <i>protein synthesis</i> • <i>Biotechnology</i> • <i>mutations; natural selection and selective breeding</i> • <i>Preserving diversity and habitats</i> 	<p>HS-LS4-1: Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.</p> <p>HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of</p>

		<ul style="list-style-type: none"> • <i>Human decision-making and environment</i> 	<p>proteins, which carry out the essential functions of life through systems of specialized cells.</p> <p>HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.</p> <p>HS-LS4-4. Construct an explanation based on evidence for how natural selection leads to adaptation of populations.</p>
March -	<i>Unit 7: Ecosystems and Invasive Species</i>	<ul style="list-style-type: none"> • <i>Components of ecosystem</i> • <i>Interdependence of species</i> • <i>Cycles of matter and energy transformations</i> • <i>Relationships between species and their environment</i> • <i>Ecological succession</i> • <i>Dynamic equilibrium</i> • <i>Respiration and photosynthesis</i> • <i>Characteristics of life</i> • <i>Cell Theory</i> 	<p>HS-LS2-6. Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.</p> <p>HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.</p> <p>HS-LS2-1: Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.</p> <p>HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.</p>
April -	<i>Unit 8: Climate Change & Human Impact</i>	<ul style="list-style-type: none"> • <i>human impact: climate change</i> • <i>human impact on ecosystems</i> • <i>Evolution</i> • <i>Carbon cycle</i> • <i>Cycling of matter and flow of energy through ecosystems</i> 	<p>HS-LS4-1. Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.</p> <p>HS-LS4-2: Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.</p> <p>HS-LS4-4: Construct an explanation based on evidence for how natural selection leads to adaptation of populations.</p> <p>HS-LS4-5: Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.</p>
May -	<i>Unit 9: Regents Review</i>	<ul style="list-style-type: none"> • <i>Review of previous units</i> 	

