

	<p>Course Title: Urban Ecology The major theme for this course is the study of living organisms and their interactions with humans and the environment. In this course, cities are investigated as an “urban ecosystem”. This course will focus on five main themes: (1) the ecological significance of organisms (2) the historical impact humans have had on the Earth, (3) Environmental Ethics and Policy, (4) Conservation of our natural resources and biodiversity, and (5) how all of these factors play a role in decisions made in urban and community development. Length of Course: Year-long</p>	
Unit	<p style="text-align: center;"><u>August/September</u> Unit 1: The Backbone of Science <u>Writing Focus: Explanatory</u></p>	
Essential Questions	<p>How do scientists provide answers to questions that I care about?</p>	
Standards	<p>SIS1. Make observations, raise questions, and formulate hypotheses. SIS2. Design and conduct scientific investigations. SIS3. Analyze and interpret results of scientific investigations. SIS4. Communicate and apply the results of scientific investigations.</p>	
Concepts and Skills	<ul style="list-style-type: none"> ➤ Formulate a testable hypothesis ➤ Design experiments to test hypotheses ➤ Conduct scientific investigations ➤ Construct a graph from data ➤ Analyze data using the various types of graphs ➤ Use scientific units of measurement 	<p>SIS1. Make observations, raise questions, and formulate hypotheses. SIS2. Design and conduct scientific investigations. SIS3. Analyze and interpret results of scientific investigations. SIS4. Communicate and apply the results of scientific investigations.</p> <p style="text-align: center;">Common Core Reading Standards</p> <p>CCRSL.2 Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.</p> <p>CCRSL.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.</p> <p>CCWSL.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p style="text-align: center;">Common Core Math Standards</p> <p>CCSS.Math.Content.7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.</p>

	<p>CCSS.Math.Content.7.SP.C.6 approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.</p> <p>CCSS.Math.Content.8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.</p> <p>CCSS.Math.Content.8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.</p>
<p>Content Objectives</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> ➤ Formulate a testable hypothesis ➤ Differentiate between qualitative and quantitative observations ➤ Identify three types of graphs and explain the ways they are used ➤ Distinguish between dependent and independent variables ➤ Analyze data using the various types of graphs ➤ Describe trends in graphs and/or tables ➤ Construct a graph from data ➤ Identify the steps scientists often use to solve problems (scientific method) ➤ Describe science as a dynamic process based on reproducibility, verifiability, and falsification ➤ Name the prefixes used in SI and indicate what multiple of ten each one represents ➤ Identify the SI units and symbols for length, volume, mass, density, time and temperature ➤ Convert related SI units
<p>Assessments/ Products/Practices</p>	<p>Laying the Foundations Labs:</p> <ul style="list-style-type: none"> ➤ Select lab equipment to be used during the year ➤ Gateway to Science workbooks ➤ Heart Rate/Music Lab materials ➤ Milk Lab materials ➤ Yeast lab materials <p>Standard Criteria of Assessment used in all Units:</p> <ul style="list-style-type: none"> ➤ Minimum 76% mastery on summative unit exams, including multiple choice and open response ➤ Class participation/engagement

- Performance-based mastery of lab activities
- Student-provided grading rubrics for projects and presentations
- Student-provided writing rubrics and exemplars for open response questions

Notebooks:

- **Content Notes (every day or close to it):** Students will identify topics; identify the main ideas and most important details and examples associated with each topic; include summaries as well as student-generated follow-up questions and answers, reflections, visualizations, and responses to the content, using higher order thinking skills (e.g., predict, connect, infer, analyze, evaluate, categorize, synthesize).
- **Vocabulary:** Students will highlight additional, key vocabulary in their notebooks; they will build an understanding of the vocabulary using vocabulary-development exercises (e.g., word webs, Frayer Model), as well as use the vocabulary in their daily work and conversations.
- **Narrative and Explanatory Essay (in response to one or more Essential and Guiding Questions)/Investigation Reports:** Student work will include evidence of planning: graphic organizers, brainstorming lists; editing of language, vocabulary, grammar, structure; organized and developed ideas utilizing precise and domain specific language; student sharing, student and teacher feedback, and revisions based on these conversations. Argumentative essays/investigation reports will include an explicit claim, scientific evidence in support of the claim (from reports, data, observations, etc.), and an explanation of how the evidence connects to and verifies the claim.
- **Other Sample Products:** KWL Charts. Venn Diagrams, Concept Maps, H.O.T. Boxes, Others?

**Texts, Materials,
and
Resources**

- Holt Biology 2008 - DeSalle/Heithaus
- Gateway to Science: Workbook with Labs 2008 - Collins
- Globe Biology 1998 - Globe Publishers
- Biology: A Community Context 1998 - Leonard/Penick
- Environmental Science: Systems and Solutions 1997 - McKinney/Schoch
- Interactive Textbook worksheets - Holt, Rinehart, and Winston
- Explorelearning Gizmos online resources
- Super Teacher Worksheets
- The Garbage Story 1996 - AGC/United Learning (readings, videos, worksheets)
- Current Science News Articles
- Plant Identification Guides
- Various Internet Resources, including
 - World Biomes: <http://www.worldbiomes.com/default.htm>
 - NASA: <http://earthobservatory.nasa.gov/Experiments/Biome/>
 - Blue Planet: http://www.blueplanetbiomes.org/world_biomes.htm

- UC Berkeley: <http://www.ucmp.berkeley.edu/glossary/gloss5/biome/>
- Missouri Botanical Garden: <http://www.mbgnet.net/index.html>
- Virginia Tech Leaf Identification Key: <http://dendro.cnre.vt.edu/dendrology/syllabus/key/location.htm>
- Arborday Foundation Tree ID key: <http://www.arborday.org/trees/whattree/whatTree.cfm?ItemID=E6A>
- Holt Online Interactive sites:
 - Evolution: http://my.hrw.com/sh2/sh07_10/student/flash/virtual_investigations/hx/hxevo_vi.html
 - Population Genetics: http://my.hrw.com/sh2/sh07_10/student/flash/virtual_investigations/hx/hxpop_vi.html
 - Classification: http://my.hrw.com/sh2/sh07_10/student/flash/virtual_investigations/hx/hxcls_vi.html
- PBS Teachers Domain interactive sites:
 - Darwin's Diary: <http://www.pbs.org/wgbh/evolution/humans/riddle/>
 - Riddle of the Bones: <http://www.pbs.org/wgbh/evolution/humans/riddle/>
 - Evolution Library: <http://www.pbs.org/wgbh/evolution/library/index.html>
- Scholastic. co Interactive sites:
 - Discover with Darwin: <http://teacher.scholastic.com/activities/explorations/adaptation/>

Essential Questions

How can we design buildings that are sustainable and preserve the environment?

Standards

Cell Biology: 2.4 Identify the reactants, products, and basic purposes of photosynthesis and cellular respiration. Explain the interrelated nature of photosynthesis and cellular respiration in the cells of photosynthetic organisms.

Ecology: 6.4 Explain how water, carbon, and nitrogen cycle between abiotic resources and organic matter in an ecosystem, and how oxygen cycles through photosynthesis and respiration.

Ecology 6.3 Use a food web to identify and distinguish producers, consumers, and decomposers, and explain the transfer of energy through trophic levels. Describe how relationships among organisms (predation, parasitism, competition, commensalism, mutualism) add to the complexity of biological communities.

Earth and Space Science 2.2 Describe the effects on the environment and on the carbon cycle of using both renewable and nonrenewable energy resources (eg. Fossil fuels, nuclear energy)

Earth and Space Science: 3.2 Describe the carbon cycle

Earth and Space Science: 3.3 Describe the nitrogen cycle

Biology: 6.4 Explain how water, carbon, and nitrogen cycle between abiotic resources and organic matter in an ecosystem, and how oxygen cycles through photosynthesis and respiration

Concepts and Skills

Concepts

- Identify the different levels and members of a food chain including: producer, consumer, herbivore, omnivore, carnivore, detritivore, decomposer
- Diagram food webs when given scenarios
- Predict how all species in a food web are affected when one species' population changes
- Identify tree species using botanical terminology
- Illustrate the flow of carbon, nitrogen, and water through an ecosystem
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- SIS1. Make observations, raise questions, and formulate hypotheses.
- SIS2. Design and conduct scientific investigations.
- SIS3. Analyze and interpret results of scientific investigations.
- SIS4. Communicate and apply the results of scientific investigations.

Common Core Reading Standards

CCRSL.2 Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.

CCRSL.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

CCWSL.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Common Core Math Standards

CCSS.Math.Content.7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.

CCSS.Math.Content.7.SP.C.6 approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.

CCSS.Math.Content.8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

CCSS.Math.Content.8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.

Unit	September/October/November <u>Unit 2: ECOSYSTEMS: TREES AND THE TRANSFER OF ENERGY</u> Writing Focus: Explanatory
Content Objectives	<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> ➤ Identify the five different levels of organization in ecology ➤ Identify the importance of models to ecology ➤ Compare and contrast abiotic factors with biotic factors ➤ Describe some adaptations that allow organisms to avoid unfavorable conditions ➤ Detail the differences between the major biomes ➤ Use a food web to identify and distinguish between producers, consumers and decomposers ➤ Explain the concept of trophic levels ➤ Identify trophic levels ➤ Examine the relationships between organisms ➤ Explain the transfer of energy from one trophic level to the next ➤ Explain the concept of the niche ➤ Identify the different levels and members of a food chain including: producer, consumer, herbivore, omnivore, carnivore, detritivore, decomposer ➤ Diagram food webs when given scenarios ➤ Predict how all species in a food web are affected when one species' population changes ➤ Integrate different food chains to compose a food web as a combination of many different food chains in an ecosystem ➤ Describe the role of chlorophylls and other pigments in photosynthesis ➤ Describe what happens to a water molecule in photosynthesis ➤ Describe the process of photosynthesis (i.e. purpose, reactants, products) ➤ Indicate key factors in a riparian ecosystem (river ecosystem) ➤ Identify trees using tree terminology ➤ Describe the environmental impact of the major trees locally ➤ Outline the steps of the three environmental cycles and outline them cyclically ➤ Explain the theme of interconnectedness (with regards to ecological models) ➤ Illustrate the flow of carbon, nitrogen, and water through an ecosystem
Assessments/ Products/Practices	<p>Laying the Foundations Labs:</p> <ul style="list-style-type: none"> ➤ Soil Erosion Quick Lab ➤ Carbon Cycle Quick Lab ➤ Greenhouse Effect Inquiry Lab ➤ Using a Microscope Lab <p>Extended Labs:</p> <ul style="list-style-type: none"> ➤ Owl Pellets Lab

	<ul style="list-style-type: none"> ➤ Biotic Factors Lab ➤ Compost Columns ➤ Community/Ecosystem Inventory ➤ Plant Cell Lab ➤ Bread Mold Lab ➤ Biome Powerpoint Presentations ➤ Food Web Models ➤ Environmental cycles group presentations ➤ Merrimack River Water Quality - Service Learning Project ➤ Leaf Guidebook <p>Notebooks:</p> <ul style="list-style-type: none"> ➤ Content Notes (every day or close to it): Students will identify topics; identify the main ideas and most important details and examples associated with each topic; include summaries as well as student-generated follow-up questions and answers, reflections, visualizations, and responses to the content, using higher order thinking skills (e.g., predict, connect, infer, analyze, evaluate, categorize, synthesize). ➤ Vocabulary: Students will highlight additional, key vocabulary in their notebooks; they will build an understanding of the vocabulary using vocabulary-development exercises (e.g., word webs, Frayer Model), as well as use the vocabulary in their daily work and conversations. ➤ Narrative and Explanatory Essay (in response to one or more Essential and Guiding Questions)/Investigation Reports: Student work will include evidence of planning: graphic organizers, brainstorming lists; editing of language, vocabulary, grammar, structure; organized and developed ideas utilizing precise and domain specific language; student sharing, student and teacher feedback, and revisions based on these conversations. Argumentative essays/investigation reports will include an explicit claim, scientific evidence in support of the claim (from reports, data, observations, etc.), and an explanation of how the evidence connects to and verifies the claim. ➤ Other Sample Products: KWL Charts. Venn Diagrams, Concept Maps, H.O.T. Boxes, Others?
Unit	<p><u>December/January</u> Unit 3: SUSTAINABILITY: ECO ART Writing Focus: Research</p>
Essential Questions	<p>How can we design buildings that are sustainable and preserve the environment?</p>

<p>Standards</p>	<p>Technology and Engineering: 4.4 Identify and explain alternatives to non-renewable energies</p> <p>Technology and Engineering: 4.3 Explain how environmental conditions such as wind, solar angle and temperature, influence the design of buildings</p> <p>Earth and Space Science: 2.1 Recognize, describe, and compare renewable energy resources (eg. Solar, wind, water, biomass) and non-renewable energy resources (eg. Fossil fuels, nuclear energy)</p>	
<p>Concepts and Skills</p>	<p><i>Concepts</i></p> <ul style="list-style-type: none"> ➤ Identify and analyze the materials used to build eco-friendly houses ➤ Design eco-friendly houses ➤ Develop materials for community outreach on environmental issues 	<p>SIS1. Make observations, raise questions, and formulate hypotheses. SIS2. Design and conduct scientific investigations. SIS3. Analyze and interpret results of scientific investigations. SIS4. Communicate and apply the results of scientific investigations.</p> <p style="text-align: center;">Common Core Reading Standards</p> <p>CCRSL.2 Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.</p> <p>CCRSL.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.</p> <p>CCWSL.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p style="text-align: center;">Common Core Math Standards</p> <p>CCSS.Math.Content.7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.</p> <p>CCSS.Math.Content.7.SP.C.6 approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.</p> <p>CCSS.Math.Content.8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.</p> <p>CCSS.Math.Content.8.SP.A.3 Use the equation of a linear model to solve problems in the context of</p>

	<p>bivariate measurement data, interpreting the slope and intercept.</p>
<p>Content Objectives</p>	<ul style="list-style-type: none"> ➤ Analyze changes in an ecosystem resulting from natural causes, changes in climate, human activity, or introduction of non-native species ➤ Describe the process of Global warming and Climate change ➤ Describe how energy conservation leads to sustainable ecosystems ➤ Evaluate the importance of the 3Rs (reduce, recycle and reuse) ➤ Identify and analyze the materials used to build eco-friendly houses ➤ Construct ECO art using “stuff” that is no longer used
<p>Assessments/ Products/Practices</p>	<p>Laying the Foundations Labs: Trash Inventory</p> <p>Extended Labs: Bottle Biosphere Lab Eco Art Project Design-a-House Architecture Project Design-a-School Architecture Project Community Water Conservation Outreach School Recycling/Composting Initiative</p> <p>Notebooks:</p> <ul style="list-style-type: none"> ➤ Content Notes (every day or close to it): Students will identify topics; identify the main ideas and most important details and examples associated with each topic; include summaries as well as student-generated follow-up questions and answers, reflections, visualizations, and responses to the content, using higher order thinking skills (e.g., predict, connect, infer, analyze, evaluate, categorize, synthesize). ➤ Vocabulary: Students will highlight additional, key vocabulary in their notebooks; they will build an understanding of the vocabulary using vocabulary-development exercises (e.g., word webs, Frayer Model), as well as use the vocabulary in their daily work and conversations. ➤ Narrative and Explanatory Essay (in response to one or more Essential and Guiding Questions)/Investigation Reports: Student work will include evidence of planning: graphic organizers, brainstorming lists; editing of language, vocabulary, grammar, structure; organized and developed ideas utilizing precise and domain specific language; student sharing, student and teacher feedback, and revisions based on these conversations. Argumentative essays/investigation reports will include an explicit claim, scientific evidence in support of the claim (from reports, data, observations, etc.), and an explanation of how the evidence

Unit	<u>February/March/April</u>
	Unit 4: GOING GREEN Writing Focus: Argument ➤ Other Sample Products: KWL Charts, Venn Diagrams, Concept Maps, H.O.T. Boxes, Others?

<p>Essential Questions</p>	<p>What actions can I take to preserve the environment for current and future generations?</p>	
<p>Standards</p>	<p>Biology: 6.1 Explain how birth, death, immigration, and emigration influence population size</p>	
<p>Concepts and Skills</p>	<p><i>Content</i></p> <ul style="list-style-type: none"> ➤ Create graphs showing population changes. ➤ Evaluate the impacts of natural causes, climate change, and human interference on a species' population growth. ➤ Debate about current and future environmental problems (pesticides, runoff, overfishing) ➤ Debate about the pros and cons of organic living 	<p>SIS1. Make observations, raise questions, and formulate hypotheses. SIS2. Design and conduct scientific investigations. SIS3. Analyze and interpret results of scientific investigations. SIS4. Communicate and apply the results of scientific investigations.</p> <p style="text-align: center;">Common Core Reading Standards</p> <p>CCRS.2 Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.</p> <p>CCRS.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.</p> <p>CCWSL.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p style="text-align: center;">Common Core Math Standards</p> <p>CCSS.Math.Content.7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.</p> <p>CCSS.Math.Content.7.SP.C.6 approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.</p> <p>CCSS.Math.Content.8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.</p>

		<p>CCSS.Math.Content.8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.</p>
<p>Content Objectives</p>	<ul style="list-style-type: none"> ➤ Analyze graphs showing birthrate and death rate. ➤ Create graphs showing population changes. ➤ Contrast exponential and logistic growth. ➤ Explain how birth, death, immigration and emigration influence population size ➤ Analyze population changes that result from natural causes, climate change, and human interference. ➤ Examine current and future problems of our oceans and rainforests (pesticides, runoff, overfishing) ➤ Describe green business and technology (fair trade and consumer choices) ➤ Evaluate the effects of world human overpopulation (food demands, fossil fuel demands and carrying capacity) ➤ Explain environmental justice ➤ Evaluate the pros and cons of organic living (organic foods, vegan/vegetarian, local farming, sustainable agriculture) 	
<p>Assessments/ Products/Practices</p>	<p>Laying the Foundations Labs: Population Growth Quick Lab Population Size Inquiry Lab</p> <p>Extended Labs: Yeast Population Lab Human Population Project Organic Garden Project Outdoor Composting Green Business Proposal Fair Trade Project Water Quality Conference</p> <p>Notebooks:</p> <ul style="list-style-type: none"> ➤ Content Notes (every day or close to it): Students will identify topics; identify the main ideas and most important details and examples associated with each topic; include summaries as well as student-generated follow-up questions and answers, reflections, visualizations, and responses to the content, using higher 	

	<p>order thinking skills (e.g., predict, connect, infer, analyze, evaluate, categorize, synthesize).</p> <ul style="list-style-type: none"> ➤ Vocabulary: Students will highlight additional, key vocabulary in their notebooks; they will build an understanding of the vocabulary using vocabulary-development exercises (e.g., word webs, Frayer Model), as well as use the vocabulary in their daily work and conversations. ➤ Narrative and Explanatory Essay (in response to one or more Essential and Guiding Questions)/Investigation Reports: Student work will include evidence of planning: graphic organizers, brainstorming lists; editing of language, vocabulary, grammar, structure; organized and developed ideas utilizing precise and domain specific language; student sharing, student and teacher feedback, and revisions based on these conversations. Argumentative essays/investigation reports will include an explicit claim, scientific evidence in support of the claim (from reports, data, observations, etc.), and an explanation of how the evidence connects to and verifies the claim. ➤ Other Sample Products: KWL Charts. Venn Diagrams, Concept Maps, H.O.T. Boxes, Others?
Unit	<p><u>May/June</u> Unit 5: BIODIVERSITY AND CONSERVATION Writing Focus: Research</p>
Essential Questions	<p>What actions can I take to preserve the world's biodiversity?</p>
Standards	<p>Biology 6.2 Analyze changes in population size and biodiversity (speciation and extinction) that results from the following: natural causes, changes in climate, human activity, and the introduction of invasive, non-native species</p> <p>Biology 5.1 Explain how evolution is demonstrated by evidence of fossil record, comparative anatomy, genetics, molecular biology, and examples of natural selection</p> <p>Biology 5.2 Describe species as reproductively distinct groups of organisms. Recognize that species are further classified as hierarchical taxonomic system (kingdom, phylum, class, order, family, genus, species) based on morphological, behavioral, and molecular similarities. Describe the role that geographic isolation can play in speciation</p> <p>Biology 5.3 Explain how evolution through natural selection can result in changes in biodiversity through the increase or decrease of genetic diversity within a population</p>

<p>Concepts and Skills</p>	<p><i>Concepts</i></p> <ul style="list-style-type: none"> ➤ Identify species using taxonomic keys ➤ Construct a basic phylogenetic tree using morphological data ➤ Debate about the evidence that support evolution and theories about evolutionary processes 	<p>SIS1. Make observations, raise questions, and formulate hypotheses. SIS2. Design and conduct scientific investigations. SIS3. Analyze and interpret results of scientific investigations. SIS4. Communicate and apply the results of scientific investigations.</p> <p style="text-align: center;">Common Core Reading Standards</p> <p>CCRSL.2 Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.</p> <p>CCRSL.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.</p> <p>CCWSL.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p style="text-align: center;">Common Core Math Standards</p> <p>CCSS.Math.Content.7.SP.A.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.</p> <p>CCSS.Math.Content.7.SP.C.6 approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.</p> <p>CCSS.Math.Content.8.SP.A.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.</p> <p>CCSS.Math.Content.8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.</p>
<p>Content Objectives</p>	<ul style="list-style-type: none"> ➤ Define a species as reproductively distinct groups of organisms ➤ Recognize and identify species using the taxonomic system ➤ Describe the role that geographical isolation can play on speciation 	

	<ul style="list-style-type: none"> ➤ Analyze changes in population size and biodiversity from the following causes: changes in climate, human activity, and introduction of invasive and non-native species
<p>Assessments/ Products/Practices</p>	<p>Laying the Foundations Labs: Natural Selection Quick Lab Random Sampling Lab Classification Systems Lab Cladogram Construction Lab</p> <p>Extended Labs: Insect Camouflage Lab Amino Acid Analysis Lab Dichotomous Keys Lab "Long and Short Beaked Bird" Evolution Game Lake Victoria Fish Project</p> <p>Web-based Activities: Evolution and Natural Selection Population Genetics Virtual Lab Classification Virtual Lab (my.hrw.com) Darwin's Diary at PBS Teachers' Domain. Riddle of the Bones at PBS Teachers' Domain. Discover with Darwin at Scholastic.com includes several interactives involving the Galapagos Islands. Evolution Library at PBS Teachers' Domain.</p> <p>Notebooks:</p> <ul style="list-style-type: none"> ➤ Content Notes (every day or close to it): Students will identify topics; identify the main ideas and most important details and examples associated with each topic; include summaries as well as student-generated follow-up questions and answers, reflections, visualizations, and responses to the content, using higher order thinking skills (e.g., predict, connect, infer, analyze, evaluate, categorize, synthesize). ➤ Vocabulary: Students will highlight additional, key vocabulary in their notebooks; they will build an understanding of the vocabulary using vocabulary-development exercises (e.g., word webs, Frayer Model), as well as use the vocabulary in their daily work and conversations. ➤ Narrative and Explanatory Essay (in response to one or more Essential and Guiding Questions)/Investigation Reports: Student work will include evidence of planning: graphic organizers, brainstorming lists; editing of language, vocabulary, grammar, structure; organized and developed ideas utilizing precise and domain specific language; student sharing, student and teacher feedback, and revisions based on these conversations. Argumentative essays/investigation

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