

	Grade Level: 7 Team Members: Olivia Couturier and Jessica Philbrick Number of Days of Unit: 3 months (dependent on field trips)
	Life Science
Essential Questions	• What is a population? • Do populations change in size? • How does a population change over time? • How do you graph a population? • What factors limit population growth? • What are adaptations? • How do adaptations help an organism survive? • What is an organism's niche? (job) • What are the 3 examples of symbiosis? • What are the energy roles in an ecosystem? • How does energy move through an ecosystem? (food chains and food webs) • How do human activities affect ecosystems? •
Content Standards	• 7.MS-LS1-4. Construct an explanation based on evidence for how characteristic animal behaviors and specialized plant structures increase the probability of successful reproduction of animals and plants. • 7.MS-LS2-1. Analyze and interpret data to provide evidence for the effects of periods of abundant and scarce resources on the growth of organisms and the size of populations in an ecosystem. • 7.MS-LS2-2. Describe how relationships among and between organisms in an ecosystem can be competitive,

	predatory, parasitic, and mutually beneficial and that these interactions are found across multiple ecosystems. ● 7.MS-LS2-3. Develop a model to describe that matter and energy are transferred among living and nonliving parts of an ecosystem and that both matter and energy are conserved through these processes. ● 7.MS-LS2-4. Analyze data to provide evidence that disruptions (natural or human-made) to any physical or biological component of an ecosystem can lead to shifts in all its populations. ● 7.MS-LS2-5. Evaluate competing design solutions for protecting an ecosystem. Discuss benefits and limitations of each design.* ● Explain how changes to the biodiversity of an ecosystem—the variety of species found in the ecosystem—may limit the availability of resources humans use. ● <i>*8.MS-LS4-4. Use a model to describe the process of natural selection, in which genetic variations of some traits in a population increase some individuals' likelihood of surviving and reproducing in a changing environment. Provide evidence that natural selection occurs over many generations.</i>		
Concepts and subskills	<table> <tr> <td data-bbox="390 638 1266 1458"> Students will understand that... 1. relevant questions related to the environment can be answered through direct research and data gathering. 2. Human interactions with the environment can impact the health of the Earth. 3. Like a multicellular living organism, the Earth is a dynamic interconnected array of specialized systems. 4. It is important to act as a steward of our environment with knowledge of our community's history (natural and human) and ecology. 5. Students will be able to conduct quadrant population data collection and analysis. Students will be able to create and interpret data tables and graphs and use them to communicate with others. Students will be able to explain how the environment and human interactions can affect the population of the species being studied. </td><td data-bbox="1266 638 1990 1458"> Practices 1. Asking questions. 2. Defining problems 3. Developing and using models 4. Planning and carrying out investigations 5. Analyzing and interpreting data 6. Using mathematics and computational thinking 7. Constructing explanations 8. Engaging in argument from evidence 9. Obtaining, evaluating, and communicating information </td></tr> </table>	Students will understand that... 1. relevant questions related to the environment can be answered through direct research and data gathering. 2. Human interactions with the environment can impact the health of the Earth. 3. Like a multicellular living organism, the Earth is a dynamic interconnected array of specialized systems. 4. It is important to act as a steward of our environment with knowledge of our community's history (natural and human) and ecology. 5. Students will be able to conduct quadrant population data collection and analysis. Students will be able to create and interpret data tables and graphs and use them to communicate with others. Students will be able to explain how the environment and human interactions can affect the population of the species being studied.	Practices 1. Asking questions. 2. Defining problems 3. Developing and using models 4. Planning and carrying out investigations 5. Analyzing and interpreting data 6. Using mathematics and computational thinking 7. Constructing explanations 8. Engaging in argument from evidence 9. Obtaining, evaluating, and communicating information
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	6. Students should be able to identify adaptations in organisms and be able to explain how these adaptations make it easier for the organism to survive. Students should be able to identify and explain how relationships among different organisms may affect the way an organism needs to survive and how this can lead to changing adaptations. 7. Students will be able to create food webs and food chains and understand how energy flows throughout an ecosystem. Students will understand how the sun is the original source of energy. Students will be able to distinguish between producers and consumers and decomposers and these organisms obtain their energy.	
Content Objectives "I Can Statements"	• I can given an example of an organism and its habitat • I can distinguish between biotic and abiotic factors in a habitat • I can put the levels of ecological organization in the correct order → organism, population, community, ecosystem • I can make a bar graph showing births and deaths in a population over time. • I can make a graph digitally to show how a population changes over time. • I can interpret a population graph and make inferences about what has happened to a population over time. • I can solve population change problems. • I can describe how change to the physical and biological components of an ecosystem can affect populations. • I can calculate the population density of a given area. • I can provide examples of how organisms are adapted for survival • I can explain how resource availability can affect populations of organisms in an ecosystem. • I can identify patterns of interactions between organisms in an ecosystem. • I can describe examples of behavioral and structural adaptations on an organism. • I can hypothesize how changes to the predator/prey relationship negatively affect an ecosystem. • I can explain how species in an ecosystem interact through symbiotic relationships. • I can distinguish between the three types of symbiosis and give an example of each one (commensalism, parasitism, and mutualism) • I can describe the flow of matter and energy through the living and nonliving parts of an ecosystem. • I can interpret evidence on how natural selection affects a population over time. • I can distinguish between producers, consumers and decomposers. • I can explain how food chains show the flow of energy • I can identify populations within an ecosystem.	

	• I can identify the different energy roles in a food chain or food web. • I can identify a food web and a food chain and explain the difference between the two models. • I can identify the apex predator in a food web and explain its importance in a habitat.
Content Vocabulary	habitat biotic factor abiotic factor species population community ecosystem ecology dichotomous key Classification birth rate death rate immigration emigration population density limiting factor carrying capacity natural selection adaptation niche competition predation predator prey symbiosis mutualism commensalism parasitism parasite host producer consumer herbivore omnivore

	scavenger decomposer food chain food web energy pyramid
Text, Materials, and Resources	Resources:
Assessments, Products, Projects	

	Grade Level: 7 Team Members: Olivia Couturier and Jessica Philbrick Number of Days of Unit:
	Cell Unit
Essential Questions	Questions that students should be able to answer at the end of the class that indicate their understanding of the content that was presented and their mastery of skills.
Content Standards	● 6.MS-LS1-1. Provide evidence that all organisms (unicellular and multicellular) are made of cells.: ● 6.MS-LS1-2. Develop and use a model to describe how parts of cells contribute to the cellular functions of obtaining food, water, and other nutrients from its environment, disposing of wastes, and providing energy for cellular processes. ● <i>*6.MS-LS1-3. Construct an argument supported by evidence that the body systems interact to carry out essential functions of life.</i> ● <i>*8.MS-LS3-2. Construct an argument based on evidence for how asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. Compare and contrast advantages and disadvantages of asexual and sexual reproduction.</i> ● <i>*8.MS-LS3-3(MA). Communicate through writing and in diagrams that chromosomes contain many distinct genes and that each gene holds the instructions for the production of specific proteins, which in turn affects the traits of</i>

	<i>an individual.</i>	
Concepts and subskills	Strategies that students should be able to do. These are what teachers are assessing, observing, and documenting. Skills are expressed as verbs (write, calculate). These skills relate to the goals that the school has for their students beyond standards, although often expressed in similar language.	Practices Ex. Math, Literacy or Science
Content Objectives "I Can Statements"		
Content Vocabulary		
Text, Materials, and Resources	Resources – Additional information that can be accessed in order to enhance the student's understanding of content.	
Assessments, Products, Projects	• Which type of assessments will you use to assess understanding? • Which facets of understanding will you address with each assessment? • How will you ensure that have met the desired results identified in Step 1?	

	Grade Level: Team Members: Number of Days of Unit: Timelines – The expected time that it will take to teach each unit within the class.
	Chemistry/physical
Essential Questions	Questions that students should be able to answer at the end of the class that indicate their understanding of the content that was presented and their mastery of skills.
Content Standards	• 8.MS-PS1-1. Develop a model to describe that (a) atoms combine in a multitude of ways to produce pure substances which make up all of the living and nonliving things that we encounter, (b) atoms form molecules and compounds that range in size from two to thousands of atoms, and (c) mixtures are composed of different

	proportions of pure substances. ● 8.MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. ● 8.MS-PS1-5. Use a model to explain that atoms are rearranged during a chemical reaction to form new substances with new properties. Explain that the atoms present in the reactants are all present in the products and thus the total number of atoms is conserved. ● <i>*6.MS-PS1-8(MA). Conduct an experiment to show that many materials are mixtures of pure substances that can be separated by physical means into their component pure substances.</i> ● <i>*7.MS-PS3-3. Apply scientific principles of energy and heat transfer to design, construct, and test a device to minimize or maximize thermal energy transfer.*</i> ● <i>*7.MS-PS3-4. Conduct an investigation to determine the relationships among the energy transferred, how well the type of matter retains or radiates heat, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.</i> ● <i>*7.MS-PS3-6(MA). Use a model to explain how thermal energy is transferred out of hotter regions or objects and into colder ones by convection, conduction, and radiation.</i>	
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Content Objectives "I Can Statements"		
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Text, Materials, and Resources	Resources – Additional information that can be accessed in order to enhance the student's understanding of content.	
Assessments, Products, Projects	● Which type of assessments will you use to assess understanding? ● Which facets of understanding will you address with each assessment?	

	How will you ensure that have met the desired results identified in Step 1?
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	Grade Level: Team Members: Number of Days of Unit: Timelines – The expected time that it will take to teach each unit within the class.	
	Electricity and Magnetism	
Essential Questions	Questions that students should be able to answer at the end of the class that indicate their understanding of the content that was presented and their mastery of skills.	
Content Standards	7.MS-PS2-3. Analyze data to describe the effect of distance and magnitude of electric charge on the strength of electric forces. Clarification Statement: 7.MS-PS2-5. Use scientific evidence to argue that fields exist between objects with mass, between magnetic objects, and between electrically charged objects that exert force on each other even though the objects are not in contact. 7.MS-PS3-2. Develop a model to describe the relationship between the relative positions of objects interacting at a distance and their relative potential energy in the system.	
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Assessments, Products, Projects	• Which type of assessments will you use to assess understanding? • Which facets of understanding will you address with each assessment? • How will you ensure that have met the desired results identified in Step 1?
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	Grade Level: Team Members: Number of Days of Unit: Timelines – The expected time that it will take to teach each unit within the class.	
	Natural Resources -Renewable Energy/Fossil Fuels	
Essential Questions	Questions that students should be able to answer at the end of the class that indicate their understanding of the content that was presented and their mastery of skills.	
Content Standards	• 8.MS-ESS3-1. Analyze and interpret data to explain that the Earth’s mineral and fossil fuel resources are unevenly distributed as a result of geologic processes. • 7.MS-ESS3-4. Construct an argument supported by evidence that human activities and technologies can mitigate the impact of increases in human population and per capita consumption of natural resources on the environment.	
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	Grade Level: Team Members: Number of Days of Unit: Timelines – The expected time that it will take to teach each unit within the class.	
	Water Cycle	
Essential Questions	Questions that students should be able to answer at the end of the class that indicate their understanding of the content that was presented and their mastery of skills.	
Content Standards	• 7.MS-ESS2-4. Develop a model to explain how the energy of the Sun and Earth’s gravity drive the cycling of water, including changes of state, as it moves through multiple pathways in Earth’s hydrosphere. • 8.MS-ESS1-1b. Develop and use a model of the Earth-Sun system to explain the cyclical pattern of seasons, which includes Earth’s tilt and differential intensity of sunlight on different areas of Earth across the year. • 8.MS-ESS1-2. Explain the role of gravity in ocean tides, the orbital motions of planets, their moons, and asteroids in the solar system. • <i>*6.MS-PS2-4. Use evidence to support the claim that gravitational forces between objects are attractive and are only noticeable when one or both of the objects have a very large mass.</i> • <i>*7.MS-ESS2-2. Construct an explanation based on evidence for how Earth’s surface has changed over scales that range from local to global in size.</i>	
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