Mount Pleasant Central School District

8th Grade, Science

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How does the human body heal? Why do children resemble parents? What did life look like million years ago? Students in this course will be introduced to major life science concepts, aligned with the Next Generation Science Standards. This course will have students explore the structure and function of living things and how these systems carry out life processes. They'll investigate how body systems work together to maintain health and stability, examine processes of reproduction, and how genetic traits are passed down and inherited. Students will also investigate the principles of evolution and natural selection to understand how species change over time. Later in the year, students will examine relationships between organisms and their environments, including energy flow, ecosystems, and impact of human activity. Throughout the year, students will build scientific thinking through hands-on labs, modeling, data analysis, and collaborative learning. This course lays the foundation for Regents level biology and encourages students to think critically about the living world around them.

Unit Title	Month	Content	Vocabulary	Standards	Skills	Big Ideas	Assessments
Next Generation Science	September	- Controlled experiments - Engineering design	-Scientific variables - Criteria - Constraints - Data	WHST.6-8.7 RST.6-8.1 6.EE.C.9 MS-LS2-5 MS-ETS1-1	- Solve an engineering design challenge. -Think critically to develop and design a reliable science experiment.	Scientists carry out systematic investigations in order to answer questions with reliable evidence. Engineers work collaboratively to solve problems. Engineers must identify criteria, constraints, and test and evaluate designs in order to determine the optimal solution.	Project: Engineering Water Filters Lab: Investigating Paper Towel Brands
Cells & Cellular	September	- Cells	- Unicellular	MS-LS1-1	- Plan and carry out	All living things are	NYS Lab: It's Alive!

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Process	-October	- Cellular processes (photosynthesis/ Cellular respiration) - Levels of Organization (cells to organisms)	- multicellular - Organelles - Products - Reactants	MS-LS1-2 MS-LS1-6	investigations to determine if something is a living thing. - Use systems thinking to describe how the parts of a cell contribute to its function as a whole. - Identify and explain relationships between photosynthesis and cellular respiration. - Describe an organism on different levels of scale.	made of cells, the smallest unit of life. Each cell has structures that carry out specific functions. In multicellular organisms, cells work together to form specialized tissues and functions.	Project: Cellular Energy Models

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Human Body Systems	October-November	- Human body systems - Homeostasis	- Musculoskeletal system - Endocrine system - Circulatory system - Respiratory system - Digestive system	MS-LS1-3 MS-LS1-7 MS-LS1-8	- Use models to make connections between human body systems - Create evidence based statements to explain how the body is a system of interacting subsystems composed of groups of cells	Cells form tissues and tissues form organs specialized for particular body functions. Each body system carries out a particular function. All body systems work together to maintain homeostasis.	Lab: Chicken Wing Dissection CER: Growth Lab: Removing Waste Lab: Modeling the Digestive System Lab: Measuring Reaction Rate
Reproduction & Heredity	December-January	-Structure & function of DNA - Cell division -Sexual vs. asexual reproduction	- DNA - cell division - sexual reproduction - asexual reproduction - reproductive	MS-LS1-4 MS-LS3-2	- Describe how organisms grow, develop, and reproduce.	Organisms reproduce, either sexually or asexually, and transfer their genetic information to their	Project: DNA Puzzle Project: Designing Medicines

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		- Reproductive strategies	strategy		- Demonstrate understanding of the genetic implications for sexual and asexual reproduction through models.	offspring. Animals engage in characteristic behaviors that increase the odds of reproduction. Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction.	Lab: Sexual vs. Asexual Reproduction

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Genetics	January-February	- Laws of Inheritance - Mendelian genetics - Mutations - Pedigree charts - Biotechnology	- trait - gene - allele - genotype - phenotype - mutation	MS-LS1-5 MS-LS3-1 MS-ETS1-2	-Describe laws of inheritance. -Use a punnett square to predict the probability of traits. -Analyze pedigree charts to determine ancestry. - Describe how mutations can lead to helpful, harmful, or neutral impacts on an organism.	Humans can select for specific traits, the role of technology, genetic modification, and the nature of ethical responsibilities related Structures, functions, and behaviors of organisms change in predictable ways as they progress from birth to old age.	Lab: Monster Genetics Lab: Famous Family Trees CER: Mutations - Helpful, harmful, or neutral? Debate: Should GMO's have stronger regulations?

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					-Describe the implications and uses of selective breeding and genetic engineering.		
Evolution: Unity & Diversity	March-April	- Evolution - Adaptation - Natural selection - Fitness - Fossils - Fossil record - Comparative anatomy	- Genetic variations - Gene frequency - Law of Superposition - Index Fossil	MS-LS4-1 MS-LS4-2 MS-LS4-3 MS-LS4-4 MS-LS4-5	- Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that	The collection of fossils and their placement in chronological order (e.g., through the location of the sedimentary layers in which they are found or through radioactive dating) is known as the fossil record. It	Lab: Exploring Mutations CER: Evolution of the Peppered Moth Project: Building Pangea Lab: Darwin's Finches

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					natural laws operate today as in the past. - Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. - Construct an explanation based on	documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth Anatomical similarities and differences between various organisms living today and between them and organisms in the fossil record, enable the reconstruction of evolutionary	CER: Evolutionary Relationships

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					evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	history and the inference of lines of evolutionary descent. Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become	

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						more common; those that do not become less common. Thus, the distribution of traits in a population changes.	
Ecology	May-June	- Levels of Organization - Energy & matter cycling -Ecological Relationships - Disruptions in Ecosystems	- abiotic/biotic -carrying capacity - food webs - symbiosis - ecological succession -invasive species	MS-LS2-1 MS-LS2-2 MS-LS2-3 MS-LS2-4	-Create and use models of food webs and energy pyramids to explain how matter and energy is transferred between producers, consumers, and decomposers. -Analyze and interpret data to describe how	Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors In any ecosystem,	Scavenger Hunt: Exploring the Westlake Ecosystem Lab: Pond Populations Case Study: The Wolves & Moose of Isle Royale

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					growth of organisms and population increases are limited by access to resources. -Analyze and interpret food webs to describe and predict ecological relationships.	organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction.	Project: Invasive Species Research Model: Modeling Ecological Succession