

Merton Community School District
5K-8 Science Curriculum

Grade Level	Topic and Student Outcomes	NGSS Alignment
5K	<p style="text-align: center;">Trees and Weather</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Observe the changes in trees ● Develop an understanding of what plants (and animals) need to survive ● Relationship between plants/animals and where they live ● Experience and observe the patterns and changes in weather ● Learn the importance of being prepared for severe weather 	<ul style="list-style-type: none"> ● K-PS3-1 ● K-PS3-2 ● K-ESS2-1 ● K-ESS3-2
5K	<p style="text-align: center;">PLTW - Pushes and Pulls</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Investigate pushes and pulls on the motion of an object ● Develop knowledge and skills related to forces of differing strengths and directions 	<ul style="list-style-type: none"> ● K-PS2-1 ● K-PS2-2
5K	<p style="text-align: center;">Animals two by two</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Learn what animals need to survive and the relationship between their needs and their environment ● Observe and describe the structures of life ● Observe and care for one animal over time ● Compare and contrast the needs of different animals over time 	<ul style="list-style-type: none"> ● K-LS1-1 ● K-ESS2-2 ● K-ESS3-1 ● K-ESS3-3
1st Grade	<p style="text-align: center;">Plants and Animals</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Understand the structure of 	<ul style="list-style-type: none"> ● 1-LS1-1 ● 1-LS1-2 ● 1-LS3-1

	<p>plants</p> <ul style="list-style-type: none"> ● Understand the design habitat systems (terrariums) ● Understand structures and behaviors of animals 	
1st Grade	<p>PLTW- Light and Sounds</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Understand properties of light and sounds ● Understand the design process to sketch, build, test to solve problem. 	<ul style="list-style-type: none"> ● 1-PS4-1 ● 1-PS4-2 ● 1-PS4-3 ● 1-PS4-4
1st Grade	<p>Air and Weather</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Understand how the sun warms the earth's surface ● Understand changes in daily temperature ● Understand the moon phases, daylight, and seasons 	<ul style="list-style-type: none"> ● 1-ESS1-1 ● 1-ESS1-2
2nd grade	<p>Insects and Plants</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Understand the structure of living things ● Understand the function of living things ● Understand the growth and development of plants and insects ● Understand interactions of organisms in their environment ● Understand biodiversity of organisms on land and water 	<ul style="list-style-type: none"> ● 2-LS2-1 ● 2-LS2-2 ● 2-LS4-1
2nd grade	<p>PLTW: The Changing Earth</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Explore how the surface of the Earth is always changing ● Explore how maps convey different information about the Earth ● Investigate the different forces that shape the surface of the Earth 	<ul style="list-style-type: none"> ● 2-ESS1-1 ● 2-ESS2-1 ● 2-ESS2-2 ● 2-ESS2-3

	<ul style="list-style-type: none"> Design solutions to limit the impact of erosion in a fictional community 	
2nd grade	<p style="text-align: center;">Solids and Liquids</p> <p>Students will:</p> <ul style="list-style-type: none"> Observe, describe, and compare properties of solids and liquids Conduct investigations about mixing solids and liquids Experience reversible and irreversible changes caused by heating or cooling 	<ul style="list-style-type: none"> 2-PS1-1 2-PS1-2 2-PS1-3 2-PS1-4
3rd Grade	<p style="text-align: center;">FOSS: Forces and Motion</p> <p>Students will:</p> <ul style="list-style-type: none"> Explore the forces of magnetism and gravity using magnets Explore patterns of motion Tackle an engineering design challenge in incremental steps Build on the science concepts of matter and its interactions 	<ul style="list-style-type: none"> 3-PS2-1 3-PS2-2 3-PS2-3 3-PS2-4
3rd Grade	<p style="text-align: center;">PLTW Launch/FOSS: Structures of Life</p> <p>Students will:</p> <ul style="list-style-type: none"> Observe the human skeletal system in action Investigate the differences between inherited genetic traits and traits learned/influenced by the environment Explore how offspring may express different traits than parents while learning about dominant and recessive genes Investigate how predicted outcomes compare to experimental results 	<ul style="list-style-type: none"> 3-LS1-1 3-LS3-1 3-LS3-2 3-LS4-2
3rd Grade	<p style="text-align: center;">FOSS: Water and Climate/EiE Stick in the Mud kit</p> <ul style="list-style-type: none"> Investigate the properties of water 	<ul style="list-style-type: none"> 3-ESS2-1 3-ESS2-2 3-ESS3-1

	<ul style="list-style-type: none"> ● Observe the properties of water as it is heated, cooled, and frozen ● Compare the density of water at different temperatures ● Explore the effects of environmental conditions and surface area on the rates of evaporation ● Consider how evaporation and condensation contribute to the water cycle ● Compare what happens when water is poured through different earth materials and test soil drainage rates ● Develop creativity, critical thinking, and problem-solving skills to deal with a real world issue ● Utilize the engineering design process (ask, imagine, plan, create, improve) 	
4th Grade	<p style="text-align: center;">PLTW: Collisions</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Explore the properties of mechanisms and how they change energy by transferring direction, speed, type of movement, and force ● Discover ways potential energy can be stored and released as kinetic energy ● Explain the relationship between the speed of an object and the energy of that object ● Predict the transfer energy as a result of a collision between two objects ● Develop a vehicle restraint system 	<ul style="list-style-type: none"> ● 4-PS3-1 ● 4-PS3-2 ● 4-PS3-3 ● 4-PS3-4 ● 4-ESS3-1
4th Grade	<p style="text-align: center;">Soils, Rocks, and Landforms</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Understand that geology is the study of our planet's earth 	<ul style="list-style-type: none"> ● 4-ESS1-1 ● 4-ESS2-1 ● 4-ESS2-2 ● 4-ESS3-2

	<p>materials and natural resources</p> <ul style="list-style-type: none"> ● Investigate properties of soil by comparing 4 different soils ● Use stream-table models to observe that water moves earth materials from one location to another ● Understand topography and processes that cause rapid changes to Earth's surface (landslides, earthquakes, floods, and volcanoes) ● Understand that earth has renewable and nonrenewable natural resources 	
4th Grade	<p style="text-align: center;">Environments</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Understand the relationship between organisms and their environments ● Understand that organisms need energy and matter to live and grow ● Understand that living organisms depend on one another and on their environment for their survival and the survival of populations ● Observe and describe the living and nonliving components in terrestrial environments ● Set up a freshwater aquarium with different kinds of fish, plants, and other organisms. ● Conduct a controlled experiment to see what environment brine shrimp survive best in ● Set up and monitor experiments to determine the range of tolerance of water on the germination of 4 different kinds of seeds 	<ul style="list-style-type: none"> ● 4-PS4-2 ● 4-LS1-1 ● 4-LS1-2
5th Grade	<p style="text-align: center;">PLTW Robotics</p> <p>Students will:</p>	<ul style="list-style-type: none"> ● 3-5-ETS1-1 ● 3-5-ETS1-2

	<ul style="list-style-type: none"> ● Explore robotics and their uses and impact on society ● Learn about a variety of robotic components as they build and test mobile robots that may be controlled remotely ● Apply their robotic skills and knowledge to solve a real-world problem related to environmental disaster cleanup 	<ul style="list-style-type: none"> ● 3-5-ETS1-3
5th Grade	<p style="text-align: center;">Earth and Sun</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Collect and analyze shadow data ● Observe the changes in the Moon's appearance over time ● Explore the properties of the atmosphere, energy transfer from the Sun to Earth, and water cycling in Earth's atmosphere. ● Introduced to constellations as patterns of stars and simulate Earth's rotation to observe the appearance of stars rising in the east and setting in the west. ● Introduced to the atmosphere as a mixture of gases with properties that change with altitude above Earth's surface ● Determine the variables that combine to produce the weather ● Investigate systems to observe condensation on cold surfaces and determine the components of the water cycle 	<ul style="list-style-type: none"> ● 5-PS2-1 ● 5-ESS1-1 ● 5-ESS1-2
5th Grade	<p style="text-align: center;">Mixtures and Solutions</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Make mixtures of water and solid materials and separate the mixtures with screens and filters ● Create conceptual and physical models to explain how something works. ● Determine the relative 	<ul style="list-style-type: none"> ● 5-PS1-1 ● 5-PS1-2 ● 5-PS1-3 ● 5-PS1-4

	<p>concentrations of solutions</p> <ul style="list-style-type: none"> ● Compare the solubility of materials ● Analyze separation techniques and engage in a desalination engineering design challenge ● Observe and identify changes of a chemical reaction 	
6th Grade	<p>PLTW Design and Modeling</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Measure and create designs with proper dimensioning ● Draw orthographic and isometric images ● Create 3-D models using computer modeling software ● Use the design process to work through an idea, prototyping, and project creation. 	<ul style="list-style-type: none"> ● MS-ETS1-1 ● MS-ETS1-2 ● MS-ETS1-3 ● MS-ETS1-4
6th Grade	<p>Populations & Ecosystems</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Understand the abiotic and biotic factors of an ecosystem ● Identify the biotic and abiotic factors of aquatic and terrestrial ecosystems ● Create food chains, webs, and pyramids to express the feeding relationships and energy transfers through an ecosystem ● Understand the process of energy transfer from the sun into biomass through photosynthesis ● Calculate reproductive potential based on limiting factors in a given environment ● Observe the adaptations that animals have in order to increase their chance of survival ● Understand the genetic makeup of animals ● Model the punnett squares to explain inheritance being passed on from one organism to 	<ul style="list-style-type: none"> ● MS-LS1-6 ● MS-LS1-7 ● MS-LS2-1 ● MS-LS2-3 ● MS-LS2-4

	their offspring.	
6th Grade	<p style="text-align: center;">Earth History</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Identify rocks by their characteristics ● Model the weathering process of landforms ● Use the fossil record to represent what we know about ancient life ● Model the formation of rocks through use of sedimentation in a basin. ● Understand the principle of superposition in regards to the ordering of rocks ● Investigate the Grand Canyon as a study site for the diversity of rocks and principles regarding rocks. 	<ul style="list-style-type: none"> ● MS-ESS1-4 ● MS-ESS2-2 ● MS-ESS2-3
7th Grade	<p style="text-align: center;">Physical Properties</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Be able to convert in the metric system ● Quantify small objects' mass, volume, and density ● Graph relationship between physical attributes ● Differentiate between the 3 common states of matter ● Recognize how temperature plays a role in changes of state 	<ul style="list-style-type: none"> ● MS-PS1-4 ● MS-PS3-4
7th Grade	<p style="text-align: center;">Atoms, Elements, and the Periodic Table</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Model atoms and know the three basic particles ● Use the periodic table to group elements in families according to their physical and chemical properties 	<ul style="list-style-type: none"> ● MS-PS1-1 ● MS-PS1-5 ● MS-PS1-2
7th Grade	<p style="text-align: center;">PLTW Magic of Electrons and Magnetism</p>	<ul style="list-style-type: none"> ● MS-PS2-5 ● MS-PS3-2

	<p>Students will:</p> <ul style="list-style-type: none"> ● Use principles of electricity to know how atoms and molecules use electrons to conduct and connect our world ● Use and apply Ohm's Law ● Understand force fields and non touching forces ● Use and apply concepts of potential energy 	<ul style="list-style-type: none"> ● MS-PS2-3 ● MS-PS3-5 ● MS-PS2-4 ● MS-ETS1-1 ● MS-ETS1-2 ● MS-ETS1-3 ● MS-ETS1-4
7th grade	<p>Microbes, Traits, and Natural Selection</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Learn how cells interact in organisms ● Ponder and figure out how microorganisms relate to their hosts and colonies ● Learn how traits are passed down through the generations ● See how mutations start and evolve ● Learn how variations and adaptations in populations are connected to the mechanism of natural selection 	<ul style="list-style-type: none"> ● MS-LS1-1 ● MS-LS1-2 ● MS-LS1-4 ● MS-LS1-5 ● MS-LS2-1 ● MS-LS2-2 ● MS-LS3-1 ● MS-LS3-2 ● MS-LS4-4 ● MS-LS4-5 ● MS-LS4-6
8th Grade	<p>Chemical Properties</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Make connections to atoms and how they combine to form molecules ● Investigate chemical reactions that release and absorb heat ● Learn the types of chemical reactions ● Use the law of conservation of mass to understand and relate to the idea that matter is neither created nor destroyed, only changes form 	<ul style="list-style-type: none"> ● MS-PS1-6 ● MS-PS1-5 ● MS-PS1-2
8th Grade	<p>Heat, Light, and Climate</p> <p>Students will:</p> <ul style="list-style-type: none"> ● Demonstrate how thermal energy transfers 	<ul style="list-style-type: none"> ● MS-PS3-3 ● MS-ESS2-5 ● MS-ESS2-6 ● MS-PS1-3

	<ul style="list-style-type: none"> • Understand the difference between thermal energy and temperature • Study how light interacts with matter • Learn the dual nature of light • Investigate and prove the behaviors of light and their interaction with different types of matter • Learn about current climate data and how energy is transferred throughout the planet's atmosphere 	<ul style="list-style-type: none"> • MS-PSS3-3 • MS-ESS3-4 • MS-PS4-1 • MS-PS4-2
8th Grade	<p style="text-align: center;">PLTW AR</p> <p>Students will:</p> <ul style="list-style-type: none"> • Use the design process • Learn about mechanical gears and mechanical functions • Create useful human powered mechanical objects • Use computer programming to automate robot parts • Engage in collaborative work around the engineering principles • Design and present fully automated models of everyday objects 	<ul style="list-style-type: none"> • MS-PS4-3 • MS-ETS1-1 • MS-ETS1-2 • MS-ETS1-3 • MS-ETS1-4
8th Grade	<p style="text-align: center;">Force and Motion</p> <p>Students will:</p> <ul style="list-style-type: none"> • Use force and motion to describe falling, moving, and stationary objects • Understand and apply Newton's laws of motion to falling, moving, and stationary objects • Design and create objects that will withstand impact force • Use velocity, acceleration, momentum and frictional force to describe falling, moving, and stationary objects 	<ul style="list-style-type: none"> • MS-PS3-1 • MS-PS3-2 • MS-PS2-1 • MS-PS2-2