Newburgh Enlarged City School District Science Curriculum Map – Grade 6 **Accelerated**

Grade: 6 **Accelerated**
Unit 1 - Lab Safety and Scientific Inquiry (Sept/Oct 4- weeks)

Standards	Skills and Knowledge	Overarching Concepts	Resources	Assessment
MS-ETS1-1 - Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions **MS-ETS1-2 -** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. **MS-ETS1-3 -** Analyze data from tests to determine similarities	• carry materials safely • locate needed safety equipment • practice lab safely • use lab equipment safely • dispose of use materials correctly • formulate hypothesis • conduct experiment • use scientific tools • record results • create charts/graphs • analyze data • develop conclusion based on • experimental data with support • evidence • measure using metric system • round to the nearest tenth • include units on all data • graph data appropriately • identify variables	Following safety procedures promotes working environments that foster collaboration, respect, and opportunities to participate in scientific inquiry. Scientific inquiry is highly dependent on the safe practices as well as proper planning and use of scientific tools. Conducting experiments will generate data that can be analyzed, measured, Following safety procedures promotes working environments that foster collaboration, respect, and opportunities to participate in scientific inquiry. Scientific inquiry is highly dependent on the safe practices as well as proper planning and use of scientific tools. Conducting experiments will generate data that can be	• Harcourt text • Brain Pop • Safari Montage • Science Spot • Scholastic science magazines • Current events	• Tests and Quizzes • selected worksheets. • Labs • notebook, journal checks • teacher observation • Misc. projects

and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. **MS-ETS1-4 -** Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	• Safely rules are needed to create a safe and conducive learning environment in which all participants have the responsibilities and obligation to conduct experiments and themselves in a manner that that is not dangerous. • Follow both verbally and written directions accurately. • The scientific method is an orderly sequence to problem solving that enables individuals to pose questions, seek answers, and develop solutions. • Scientific tools are used to gather data. • Variables: types and examples • Data can be analyzed in many ways using mathematical calculations to identify patterns and relationships.	analyzed, measured, and calculated to identify patterns, develop relationships, and explain events. Utilization of sequential methods develops explanations of natural phenomena in a continuing, creative process which allows us to seek answers to questions regarding the natural world.		

	• Procedural directions are followed in order. • All steps in the scientific method depend on the others. • Rounding: tenth's • Measurement: metric system • Weather describes the conditions of the atmosphere at a given location for a short period of time. • Climate is the characteristic of weather that prevails from season to season and year to year.			

Grade 6
Unit 2 – Matter (Oct/Nov 8 – weeks)

Standards	Skills and Knowledge	Overarching Concepts	Resources	Assessment
MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures. **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. **MS-PS1-3.** Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. **MS-PS1-4.** Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or	• All matter is made of atoms. • Matter has both physical and chemical properties that can be observed. • Three phases of matter: solid, liquid, gas • Measurable properties matter: mass, volume, density, length, width. • The motion of particles helps to explain the phases (states) of matter as well as changes from one phase to another. • The phase in which matter exists depends on the attractive forces among its particles. • Density is the amount of matter in a given space • Buoyancy is determined by comparing densities. • Matter can change physically or chemically. • Physical Properties: definition and examples • Chemical Properties: definition and examples • Energy is transferred during changes. • Chemical Reactions: types, causes, examples	Objects in the universe are composed of matter. Matter is anything that takes up space and has mass. Matter is composed of elements which are made of small particles called atoms. All living and nonliving materials composed of these elements or combinations of these elements. Heat is a calculated value which includes the temperature of the material, the mass of the material, and the type of material.	• Harcourt text • Brain Pop • Safari Montage • Science Spot • Scholastic science magazines • Current events	• Tests and Quizzes • selected worksheets. • Labs • notebook, journal checks • teacher observation • Misc. projects

removed. **MS-PS1-5.** Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. **MS-PS1-6.** Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes. **MS-PS1-7.** Use evidence to illustrate that density is a property that can be used to identify samples of matter. **MS-PS1-8.** Plan and conduct an investigation to demonstrate that mixtures are combinations of substances.	• Mixtures can be separated by physical means. • observe physical and chemical properties • compare properties of objects including density and buoyancy • follow safety rules • perform experiments to test properties of matter including physical and chemical properties • design and conduct experiments investigate • calculate density, mass and volume, length and width of object • create a mixture • develop means to separate mixture • measure using metric system • round to the nearest tenth • include units on all data • graph data appropriately • Illustrate different states of matter • Read and interpret the periodic table for information			

Grade 6
Weather and Climate (Dec/Jan 5 – weeks)

Standards	Skills and Knowledge	Overarching Concepts	Resources	Assessment
MS-ESS2-1 – Develop a model to describe the cycling of Earth's materials and flow of energy that drives this process. **MS-ESS2-4 –** Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the **f**orce of gravity. **MS-ESS2-5 –** Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	• Nearly all the atmosphere is confined to a thin shell surrounding Earth. The atmosphere is a mixture of gases, including nitrogen and oxygen with small amounts of water vapor, carbon dioxide, and other trace gases. The atmosphere is stratified into layers, each having distinct properties. Nearly all weather occurs in the lowest layer of the atmosphere. • As altitude increases, air pressure decreases. • The uneven heating of the Earth's surface is the cause of weather. • Air masses form when air remains nearly stationary over a large section of Earth's surface and takes on the conditions of temperature and humidity from that location. Weather conditions at a location are determined primarily by temperature, humidity, and pressure of air masses over that location.	There's a connection between weather and environmental factors. Events that occur within our atmosphere protect and influence lives by creating weather and climate changes. These changes not only shape the environment, but also effect the options and limitations of humans in the environment.	• Harcourt text • Brain Pop • Safari Montage • Science Spot • Scholastic science magazines • Current events	• Tests and Quizzes • selected worksheets. • Labs • notebook, journal checks • teacher observation • Misc. projects

MS-ESS2-6 - Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. **MS-ESS3-1** - Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. **MS-ESS3-2** – Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.	• Most local weather changes are caused by movement of air masses. • The movement of air masses is determined by prevailing winds and upper air currents. • Fronts are boundaries between air masses. Precipitation is likely to occur at these boundaries. • High pressure systems generally bring fair weather. Low-pressure systems usually bring cloudy, unstable conditions. The general movement of highs and lows is from west to east across the US. • Hazardous weather conditions include thunderstorms, tornadoes, hurricanes, ice storms, and blizzards. Humans can prepare for and respond to these conditions if given sufficient warning. • Substances enter the atmosphere naturally and from human activity. Some of these substances include dust from volcanic eruptions and greenhouse gases such as carbon dioxide, methane, and water vapor. These substances can affect weather, climate, and living things. • observe and predict weather conditions • compare/contrast atmospheric layers based on properties			

MS-ESS3-3 – Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. **MS-ESS3-4 –** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. **MS-ESS3-5** - Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century**.**	• analyze the relationship between altitude, air pressure and temperature • summarize how air pressure effects weather conditions • distinguish between weather and climate • categorize fonts and air masses based on properties • propose hazardous weather conditions preparedness plan • investigate substances in the atmosphere, and their origins and impacts to the humans and the planet. • identify global warming and propose solutions • measure using metric system • round to the nearest tenth • include units on all data • graph data appropriately • Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. (NGSS)			

Grade 6
Layers of the Earth (Jan/Feb 5 – weeks)

Standards	Skills and Knowledge	Overarching Concepts	Resources	Assessment
MS – ESS2-1 - Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. **MS – ESS2-2** - Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. **MS – ESS2-3** - Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.	• Earth's systems interact, evolve and change constantly. • Hydrosphere is the thin layer of water that covers the lithosphere. • Lithosphere is the layer of the mantel that consists of moving tectonic plates. • Layers of the Earth: composition, depth, temperature, & how it affects the surface • Tectonic movements are driven by the release of energy • Analysis of vibrational disturbances leads to conclusions about the layers within the earth. • Faults - transform, divergent, and convergent: movement direction and resulting surface affects.	Students should develop an understanding of Earth as a set of closely coupled systems. The concept of systems provides a framework in which students can investigate three major interacting components: lithosphere, hydrosphere, and atmosphere. Processes act within and among the three components on a wide range of time scales to bring about continuous change in Earth's crust, oceans, and atmosphere. Rocks provide scientists with a detailed account of the movement and relationships within the cycles of earth's processes that have and will continue to shape and change the earth's surface which influences human activities.	• Harcourt text • Brain Pop • Safari Montage • Science Spot • Scholastic science magazines • Current events	• Tests and Quizzes • selected worksheets. • Labs • notebook, journal checks • teacher observation • Misc. projects

	• The plates move across Earth's surface, carrying the continents, creating and destroying ocean basins, surface features. • Surface features of Earth: examples, & causes • Cultures of people are influenced by these movements and the resulting surface features. • All Earth's processes are the result of energy flowing and matter cycling within and among the planet's systems. The energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. (NGSS) • Rocks are composed of minerals. • Identification of rocks and minerals is based on physical & chemical features. • Rocks: types, properties, composition, origins • Fossils are found in sedimentary rocks and give evidence of historical events.			

	• Weathering and erosion are dynamic forces that wear away Earth's surface. • Gravity is the driving force in weathering and erosion. • Process: weathering & erosion: definition, examples, causes • Rock Cycle: labels, description, flow of energy, relationship to plate boundaries • Infer the origin of rock based on characteristics using rock cycle • Identify minerals within rocks using charts • Classify rocks based on features • Explain how Earth's forces shape and change rocks and Earth's surface throughout time. • use rocks to provide historical evidence about earth using the rock cycle • illustrate the rock cycle • sort rocks based on characteristics • determine importance of gravity to changes on earth's surface • measure using metric system • round to the nearest tenth • include units on all data • graph data appropriately			

	Students will be able to: • distinguish between layers of the Earth's inner structure • describe/illustrate tectonic plate movement and its influences on other systems of earth • summarize how earth surface is shaped by movement below the surface • establish a relationship between systems of the earth (lithosphere, hydrosphere, atmosphere) • distinguish between p and s waves, their origins and features. • identify origins of surface features of earth (mtn, volcanoes, valleys,...) • synthesis cultural influences of plate tectonic movement • measure using metric system • round to the nearest tenth • include units on all data • graph data appropriately			

Grade 6
Solar System (March 3 – weeks)

Standards	Skills and Knowledge	Overarching Concepts	Resources	Assessment
MS – ESS1 – 1 - Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. **MS – ESS1 – 2** - Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. **MS – ESS1 – 3** - Analyze and interpret data to determine scale properties of objects in the solar system.	• Our sun in an average sized star. • Distance between stars are vast. • Phases of the Moon: names, appearances and origins • Celestial bodies definition, properties, and location: sun, moon, planets, star, comets, asteroids. • Planetary cycles are regular predictable motions in the solar system • Phenomena explained by movements within solar system: Day=24 hours=rotation, Year=365.25 days=revolution, lunar cycle, tides, eclipses, meteor showers & comets • Orbits of planets are elliptical • Gravity keeps planets in elliptical motion and moon in orbit around the Earth. • Tilt of Earth causes seasons • Latitude influences amount of sun an area receives • Latitude and longitude & our system of time are based on celestial observations • observe moon for lunar cycle (28 days app.)	Earth's position in the solar system, orientation, and relationship with other celestial bodies creates repeating predictable patterns in both human and geological systems. The universe is comprised of a wide array of objects, a few of which can be seen by the unaided eye. Others can only be observed with scientific instruments. These celestial objects, distinct from Earth, are in motion relative to Earth and each other. Measurements of these motions vary with the perspective of the observer. Cyclical changes on Earth are caused by interactions among objects in the universe.	• Harcourt text • Brain Pop • Safari Montage • Science Spot • Scholastic science magazines • Current events	• Tests and Quizzes • selected worksheets. • Labs • notebook, journal checks • teacher observation • Misc. projects

	• describe/illustrate observed reflected light of the moon • compare/contrast/sort/order planets distances from the sun and each from one another • compare/contrast/sort/order planets revolution and rotation • rank (sort) planets in a varieties of ways • locate celestial bodies • describe properties of comets, asteroids, meteors, planets, • explain systems of time using astronomical reasoning • summarize the effects of gravity on Earth's systems such as tides and path of orbit. • measure using metric system • round to the nearest tenth • include units on all data • graph data appropriately			

Grade 6
Energy (Apr/May 5 - weeks)

Standards	Skills and Knowledge	Overarching Concepts	Resources	Assessment
MS – PS2 – 1 - Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. **MS – PS2 – 2** - Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. **MS – PS2 – 3** - Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. **MS – PS3 – 1** - Construct and interpret graphical displays of data to describe the relationships of kinetic	• The motion of an object is always judged with respect to some other object or point. • The motion of an object can be described by its position, direction of motion and speed. • A moving object that is not subjected to a force will continue to move at a constant speed in a straight line. An object at rest will remain at rest. • Force is directly related to an object's mass and acceleration. The greater the force, the greater the change in motion. • For every action there is an equal and opposite reaction. • Every object exerts gravitational force on every other object. Gravitational force depends on how much mass the objects have and on how far apart they are. Gravity is one of the forces acting on orbiting objects and projectiles. • Friction is a force that opposes motion.	When the forces acting on an object are unbalanced, changes in that object's motion occur. The changes could include a change in speed or a change in direction. When the forces are balanced, the motion of that object will remain unchanged. Understanding the laws that govern motion allows us to predict these changes in motion. Electricity travels in a closed circuit. Some materials transfer energy better than others. Energy and matter interact: a bulb is lighted by means of electrical current. Electrical circuits provide a means of transferring electrical energy. Electrical energy can be produced from a variety of energy sources and can be transformed into	• Harcourt text • Brain Pop • Safari Montage • Science Spot • Scholastic science magazines • Current events	• Tests and Quizzes • selected worksheets. • Labs • notebook, journal checks • teacher observation • Misc. projects

energy to the mass of an object and to the speed of an object. **MS – PS3 – 2** - Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system. **MS – PS3 – 3** - Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. **MS – PS3 – 4** - Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.	• Simple machines include a lever, a pulley, a wheel and axle, and an inclined plane. A complex machine uses a combination of interacting simple machines. • Observe effects of forces (gravity) on the motion of objects. • Describe how friction effects motion. • Investigate forces at work in everyday life, such as an amusement park or playground. • Determine the speed and acceleration of a moving object. • Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. (NGSS) • Some substances are insulators, some are conductors. • Circuits are closed to work. • Electric currents and magnets can exert a force on each other. • Different forms of electromagnetic energy have different wavelengths. Some examples of electromagnetic energy are microwaves,	almost any other form of energy. Magnetism is a force that may attract or repel certain materials. The forces of gravity and magnetism can affect objects through gases, liquids, and solids. The force of magnetism decreases as distance increases. Without direct contact, a magnet attracts certain materials and either attracts or repels other magnets. The attractive force of a magnet is greatest at its poles. Without touching them, material that has been electrically charged attracts uncharged material, and may either attract or repel other charged material Energy can be transformed, one form to another. These transformations produce heat energy. Heat is a calculated value which includes the temperature of		

MS – PS3 – 5 - Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. **MS – PS4-2 -** Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	infrared light, visible light, ultraviolet light, X-rays, and gamma rays. • The Sun is a major source of energy for Earth. Other sources of energy include nuclear and geothermal energy. • Fossil fuels contain stored solar energy, and are considered non-renewable resources. • Most activities in everyday life involve one form of energy being transformed into another. For example, the chemical energy in gasoline is transformed into mechanical energy in an automotive engine. Energy, in the form of heat is almost always one of the products of energy transformations. • Heat moves in predictable ways, flowing from warmer objects, to cooler ones, until both reach the same temperature. • Most substances expand when heated, and contract when cooled. Water is the exception, expanding when changing to ice. • Sound requires a medium to travel through- liquid, solid, or gas. • Light can travel through a vacuum or empty space. • A simple wave has a repeating pattern with a specific	the material, the mass of the material, and the type of material. Temperature is a direct measurement of the average kinetic energy of the particles in a sample of material. It should be noted that temperature is not a measurement of heat. An underlying principle of all energy use is the Law of Conservation of Energy. Simply stated, energy cannot be created or destroyed. Energy exists in many forms, and when these forms change, energy is conserved. Energy cannot be created or destroyed. Temperature is a direct measurement of the average kinetic energy of the particles in a sample of material. Temperature is not a measurement of heat.		

	wavelength, frequency, and amplitude. (NGSS) • When light shines on an object, it is reflected absorbed or transmitted through the object, depending on the object's material, and the color of the light. (NGSS) • The path that light travels can be traced as straight lines, except at surfaces between different transparent materials where the light path bends. (NGSS)			

Grade 6
Living Environment **Accelerated Only** (May 3 – weeks)

Standards	Skills and Knowledge	Overarching Concepts	Resources	Assessment
MS-LS1-1 - Plan and conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. **MS-LS1-2 -** Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	• All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). • Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. • In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions.	Cause and Effect • Cause and effect relationships may be used to predict phenomena in natural systems. Scale, Proportion, and Quantity • Phenomena that can be observed at one scale may not be observable at another scale. Systems and System Models • Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. Structure and Function • Complex and microscopic structures and systems can be visualized, modeled, and used to describe	• Harcourt text • Brain Pop • Safari Montage • Science Spot • Scholastic science magazines • Current events	• Tests and Quizzes • selected worksheets. • Labs • notebook, journal checks • teacher observations • Misc. projects

		how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS1-2)		