ELIZABETH PUBLIC SCHOOLS
Every child, Achieving Excellence

Marking Period 1 (MP1)	Science Curriculum Pacing Guide Grade 8
MP1 **Standards for Science Content**	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. (ESS U8L1/L2) MS-ESS1-2 Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. (ESS U9L3) MS-ESS1-3 Analyze and interpret data to determine scale properties of objects in the solar system. (ESS U9L1/L2) MS-PS2-4 Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects (ESS U9L2)
MP1 **Topics**	Earth and Space Sciences Unit 8 - Patterns in the Solar System; Unit 9 - The Solar System and Universe
MP1 **Skills/Concepts**	•The moon moves across the sky daily, and its shape changes with a repeating pattern over approximately a month. (ESS U8L1) •The moon moves across the sky each day. (ESS U8L1) •The shape of the sunlit area of the moon that we see from Earth changes over an approximate 28-day cycle. (ESS U8L1) •In a lunar eclipse, we see Earth's shadow on the moon. In a solar eclipse, we see the moon as a dark circular disk on the sun. (ESS U8L1) •An average day in winter is colder and shorter than in summer. (ESS U8L2) •Star patterns, known as constellations, move across the sky every night and their rising times change throughout the year. (ESS U8L2) •Most places on Earth receive more energy from the sun in summer then they do in winter. (ESS U8L2) •The number of hours of daylight increases from winter to summer. (ESS U8L2) •Meteor showers are seasonal. (ESS U9L1) •Objects closer to Earth show a greater apparent. (ESS U9L1) •The solar system includes several different types of objects. Many of them can be seen from Earth. (ESS U9L1) •The solar system includes Earth, the other planets, dwarf planets, asteroids, comets, and other objects that orbit the sun. (ESS U9L1) •All of the planets in the solar system orbit the sun in the same direction. (ESS U9L2) •Gravity causes objects in space to orbit other objects. (ESS U9L2) •Gravity caused matter in a cloud of dust and gas to condense and form the sun and planets. (ESS U9L2) •Patterns of change in stars and planetary systems can be observed and modeled. (ESS U9L2) •From Earth, the Milky Way looks like a narrow band of light and clouds across the sky, but that band is actually part of a spiral. (ESS U9L3) •A scale model of the solar system shows that distances between objects in space are much larger than the sizes of the objects. (ESS U9L3) •You can describe your location by describing the objects around you. (ESS U9L3) •There are billions of galaxies in the universe, and they are far away. (ESS U9L3)
MP1 **Core Materials**	HMH Into Science

Marking Period 2 (MP2)	Science Curriculum Pacing Guide Grade 8
MP2 **Standards for Science Content**	MS-PS2-3 Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. (PS U7) MS-PS2-5 Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact. (PS U7) MS-PS4-1 Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. (PS U8L1/L2) MS-PS4-2 Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. (PSU8L3)
MP2 **Topics**	Physical Science Unit 7 and Unit 8
MP2 **Skills/Concepts**	· As the rings are dropped onto the peg, they bounce and remain suspended in midair without touching. (PS U7L1) · Magnets attract or repel certain objects at a distance. (PS U7L1) · Magnetic materials have aligned magnetic domains. (PS U7L1) · A water drop spirals around a charged knitting needle until it touches the needle. (PS U7L2) · Electrically charged objects can attract or repel other objects. (PS U7L2) · The magnitude and direction of the electric force between objects depends on the sign and magnitude of their charges and the distance between the objects. (PS U7L2) · A compass needle points north unless it is close to a magnet. (PS U7L3) · Fields describe the effects of noncontact forces. (PS U7L3) · Fields can be measured and mapped. (PS U7L3) · A crane with a magnet picks up and drops metal objects. (PS U7L4) · The flow of electric charges is measured as current. (PS U7L4) · The motion of electric charges generates a magnetic field. (PS U7L4) · The strength of an electromagnet depends on the number of wire loops and the amount of current in the wire. (PS U7L4) · Changing magnetic fields produce current in wires. (PS U7L4) · Water in a bowl vibrates when a nearby speaker is turned on. (PS U8L1) · Waves transfer energy from one place to another. (PS U8L1) · Particles in a wave can move perpendicular or parallel to the wave's motion. (PS U8L1) · Waves with different properties can transfer different amounts of energy. (PS U8L1) · Bats use sound to hunt insects. (PS U8L2) · Mechanical waves propagate through matter. (PS U8L2) · A mechanical wave spreads out from its source in every direction possible. (PS U8L2) · At a media boundary, sound waves are at least partly reflected. (PS U8L2) · Surfaces have different colors when the same flashlight shines on them. (PS U8L3) · Light can travel from one place to another. (PS U8L3) · The color of light depends on its wavelength. (PS U8L3) · Light reflects off surfaces in predictable ways. (PS U8L3) · The color of an opaque object is determined by the light that reflects off it. (PS U8L3)
MP2 **Core Materials**	HMH Into Science

Marking Period 3 (MP3)	Science Curriculum Pacing Guide Grade 8
MP3 **Standards for Science Content**	MS-PS4-2 Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. (PS U8) MS-PS4-3 Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals. PS U8) MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. (LS U4) MS-LS2-5 Evaluate competing design solutions for maintaining biodiversity and ecosystem services. (LS U4) MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. (LS U4) MS-LS4-1 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 natural laws operate today as in the past. (LS U5)
MP3 **Topics**	Physical Science Unit 8 Lesson 3 - The Behavior or Light Waves, Lesson 4 - Information Transfer; Life Science Unit 4 - Eocsystem Dynamics; Life Science Unit 5 Lesson 1 - The Fossil Record
MP3 **Skills/Concepts**	Students develop and use models to describe how light waves interact with different media and explain how the structure of devices are designed to use light waves for specific functions. (PS U8L3) Students distinguish between graphs of analog and digital signals and explain how the structure of digital signals make them more reliable for transmitting information. (PS U8L4) Students use evidence to support an explanation of how changes in biodiversity can affect ecosystem health. (LS U4L1) Students use evidence to support an explanation of how changes in ecosystems cause changes in populations. (LS U4L2) Students evaluate competing design solutions for maintaining biodiversity, natural resources, and ecosystem services. (LS U4L3) Students will be able to explain how patterns in fossil data can be used to provide evidence for the history of life on Earth. (LS U5L1)
MP3 **Core Materials**	HMH Into Science

Marking Period 4 (MP4)	Science Curriculum Pacing Guide Grade 8
MP4 **Standards for Science Content**	MS-LS4-1 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 natural laws operate today as in the past. (LS U5) MS-LS4-2 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. (LS U5) MS-LS4-3 Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. (LS U5) MS-LS3-1 Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism (LS U6) MS-LS4-4 Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. (LS U6) MS-LS4-5 Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. (LS U6)
	MS-LS4-6 Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. (LS U6)
MP4 **Topics**	Life Science Unit 5 - The History of Life on Earth: Lessons 2 and 3; Life Science Unit 6 - Evolution
MP4 **Skills/Concepts**	•Students will be able to analyze patterns in the fossil record to explain changes in life on Earth over time. (LS U5L2) •Students will be able to analyze patterns in data to provide evidence for evolutionary relationships among organisms. (LS U5L3) •Students will be able to use a model to explain how changes to the structure of genes affect traits in an organism. (LS U6L1) •Students will be able to construct an explanation about the relationship between genetic variation adaptation and natural selection. (LS U6L2) •Students will be able to synthesize information to construct an explanation for how artificial selection can influence inheritance of traits in organisms. (LS U6L3)
MP4 **Core Materials**	HMH - Into Science