MCS Physics Subject Group Overview

Unit Name	1D Motion	2D Motion	Newton's Laws	Momentum	Energy	Waves	Electricity & Magnetism	Nuclear
Time Frame	6 weeks	6 weeks	6 weeks	3 weeks	5 weeks	3 weeks	4 weeks	3 weeks
Standards	SP1.a, SP1.b, SP1.c	SP1.c,d, SP2.d	SP2.a, SP2.b, SP2.c, SP2.d, SP2.e	SP3.d	SP3.a , SP3.b , SP3.c	SP4.a, SP4.b, SP4.c, SP4.d, SP4.e, SP4.f, SP4.g	SP5.a, SP5.b, SP5.c, SP5.d, SP5.e	SP6.a, SP6.b, SP6.c
Approaches To Learning **Instructional Strategies**	**SEP** ● Using Mathematics and Computational Thinking, ● Engaging in Arguments from Evidence **ATL** Research Skills Thinking Skills Collaboration Skills Communication Skills	**SEP** ● Using Mathematics and Computational Thinking, Analyzing and Interpreting Data ● Planning and Carrying out Investigations **ATL** Research Skills Thinking Skills Collaboration Skills Communication Skills	**SEP** ● Using Mathematics and Computational Thinking, Analyzing and Interpreting Data ● Plan and carrying out investigation ● Constructing Explanations ● Obtain, evaluate, and communicate information **ATL** Research Skills Thinking Skills Collaboration Skills Communication Skills	**SEP** ● Using Mathematics and Computational Thinking, Analyzing and Interpreting Data ● Make inferences and draw conclusions, Give and receive meaningful feedback, Process data and record results **ATL** Research Skills Thinking Skills Collaboration Skills Communication Skills	**SEP** ● Using Mathematics and Computational Thinking, ● Planning and Carrying out Investigations ● Collect, record, and analyze data **ATL** Research Skills Thinking Skills Collaboration Skills Communication Skills	**SEP** ● Developing and Using Models ● Make guesses, ask "what if" questions and generate testable hypothesis **ATL** Research Skills Thinking Skills Collaboration Skills Communication Skills	**SEP** ● Obtain, evaluate, and communicate information ● Developing and using models ● Planning and carrying out investigations ● Construction Explanations **ATL** Research Skills Thinking Skills Collaboration Skills Communication Skills	**SEP** ● Obtaining, Evaluation, and Communication Information ● Make inferences and draw conclusions **ATL** Research Skills Thinking Skills Collaboration Skills Communication Skills

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Statement of Inquiry	Modeling changes in motion graphically and mathematically predicts future movement. **Phenomenon:** All motion is composed of just a few components acting together creating a variety of different motions.	Modeling changes in motion graphically and mathematically predicts future movement. **Phenomenon:** The Hammer throw in track & field requires precise motion in order to launch the hammer for max range.	The relationships between interacting objects cause changes in their motion that can be used to discover their intrinsic properties. **Phenomenon:** Sledding inertia: A kid or a sled being pulled rapidly will not move with the sled (the kid fell off) unless the force of friction is large enough	Modeling transfers of momentum to predict the outcome of car crashes. **Phenomenon:** Cars are much safer now than they were 100 years ago.	Energy changing from one form to another can be captured for useful means. **Phenomenon:** Energy is always conserved, even when motion is not uniform or friction is involved	The nature of waves can be discovered by examining their interactions with matter. **Phenomenon:** Vibrations propagate in the form of waves. Waves transfer energy without transferring mass.	The movement of electrons can be modeled by examining specific relationships, allowing for transmission of information. **Phenomenon:** Electrical power is one of the most efficient methods for transporting energy.	Transformations of atoms follow predictable patterns that can be used for the production of power. **Phenomenon:** Atomic nuclei are unstable (radioactive) if you do not have the right number of protons and neutrons.
Global Context	Scientific and Technical Innovation	Scientific and Technical Innovation	Scientific and Technical Innovation	Scientific and Technical Innovation	Scientific and Technical Innovation	Scientific and Technical Innovation	Scientific and Technical Innovation	Scientific and Technical Innovation
Key Concepts	Cause & Effect (CCC) Stability & Change (CCC) Systems & System (MYP) Models (CCC) Patterns CCC)	Cause & Effect (CCC) Stability & Change (CCC) Systems & System (MYP) Models (CCC) Patterns (CCC)	Patterns (CCC) Matter & Energy (MYP/CCC) Structure & Function (CCC)	Cause & Effect (CCC) Stability & Change (CCC) Systems & System Models (MYP/CCC) Patterns (CCC)	Stability & Change (CCC) Matter & Energy (MYP/CCC) Patterns (CCC)	Patterns (CC) Scale, Proportion & Quantity (CC) Systems & System Models (MYP/CC)	Scale, Proportion & Quantity (CC) Matter & Energy (MYP/CC) Stability & Change (CC)	Matter & Energy (MYP/CC) Stability & Change (CC) Scale, Proportion & Quantity (CC)
Related Concepts	Movement & Energy	Movement & Energy	Movement & Evidence	Movement and Momentum	Movement, Energy & Transformation	Movement & Energy	Energy & Interactions	Energy & Form

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Core Ideas	CORE IDEAS	CORE IDEAS	CORE IDEAS	CORE IDEAS	CORE IDEAS	CORE IDEAS	CORE IDEAS	CORE IDEAS
	● Kinematics ● Scalars ● Vectors ● Displacement	● Projectile Motion ● Vector Diagrams	● Laws of Motion ● Free Body Diagrams ● Acceleration ● Friction ● Universal Gravitation	● Momentum ● Impulse ● Conservation of momentum ● Transfer of momentum	● Potential energy ● Kinetic energy ● Work ● Power ● Conservation of Mechanical energy ● Work Energy Theorem	● Electromagnetic radiation ● Transverse Waves ● Properties of Waves ● Wave Patterns ● Boundary Behavior	● Electricity ● Circuits ● Magnetism ● Static Electricity ● Voltage ● Resistance	● Atomic structure ● Nuclear Notation ● Ions & Isotopes ● Nuclear Decay ● Nuclear Decay and Half Life ● Energy Released in nuclear reactions

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MYP Criterion assessed	**MYP A:** ● ii- apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations ● iii- analyse and evaluate information to make scientifically supported judgments.	**MYP A:** ● i- explain scientific knowledge ● ii- apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations ● iii- analyse and evaluate information to make scientifically supported judgments. **MYP D:** ● i- explain the ways in which science is applied and used to address a specific problem or issue ● iii- apply scientific language effectively	**MYP A:** ● ii- apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations ● iii- analyse and evaluate information to make scientifically supported judgments. **MYP B:** ●i- explain a problem or question to be tested by a scientific investigation ●ii- formulate a testable hypothesis and explain it using scientific reasoning ●iv- design scientific investigations. **MYP C:** ●i- present collected and transformed data ●ii- interpret data and explain results using scientific reasoning ●iii- evaluate the validity of a hypothesis based on the outcome of the scientific investigation ●iv- evaluate the validity of the method	**MYP A:** ● i- explain scientific knowledge ● ii- apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations ● iii- analyse and evaluate information to make scientifically supported judgments. **MYP B:** ●i- explain a problem or question to be tested by a scientific investigation ●ii- formulate a testable hypothesis and explain it using scientific reasoning **MYP C:** ●i- present collected and transformed data ●iii- evaluate the validity of a hypothesis based on the outcome of the scientific investigation ●iv- evaluate the validity of the method ●v- explain improvements or extensions to the method. **MYP D:**	**MYP A:** ● i- explain scientific knowledge ● iii- analyse and evaluate information to make scientifically supported judgments **MYP B:** ●i- explain a problem or question to be tested by a scientific investigation ●ii- formulate a testable hypothesis and explain it using scientific reasoning ●iii- explain how to manipulate the variables, and explain how data will be collected **MYP C:** ●i- present collected and transformed data ●ii- interpret data and explain results using scientific reasoning ●v- explain improvements or extensions to the method.	**MYP A:** ● i- explain scientific knowledge ● ii- apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations ● iii- analyse and evaluate information to make scientifically supported judgments.	**MYP A:** ● ii- apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations ● iii- analyse and evaluate information to make scientifically supported judgments **MYP B:** ●i- explain a problem or question to be tested by a scientific investigation ●ii- formulate a testable hypothesis and explain it using scientific reasoning **MYP C:** ●i- present collected and transformed data ●iii- evaluate the validity of a hypothesis based on the outcome of the scientific investigation	**MYP A:** ● i- explain scientific knowledge ● ii- apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations ● iii- analyse and evaluate information to make scientifically supported judgments.

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			●v- explain improvements or extensions to the method. **MYP D:** ●ii- discuss and evaluate the various implications of using science and its application to solve a specific problem or issue ●iv- document the work of others and sources of information used.	●ii- discuss and evaluate the various implications of using science and its application to solve a specific problem or issue ● iii- apply scientific language effectively ●iv- document the work of others and sources of information used.				
Differentiation **For Tiered Learners**	Marietta City Schools teachers provide specific differentiation of learning experiences for all students. Details for differentiation for learning experiences are included on the district unit planners.							
Course Levels	**Marietta City Schools offers Enhanced, Honors, Accelerated, and AP classes to provide differentiated learning experiences for students.**							