

## MCS IB Physics Y1 Subject Group Overview

Unit Name	Space, Time, and Motion	Particulate Nature of matter	Wave behavior	Internal Assessment
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Time Frame	11 weeks	10 weeks	9 weeks	3 Weeks
Standards/ IB Topics	A.1, A.2, A.3	B.1, B.2, B.3, B.5	C.1, C.2, C.3, C.4, C.5	Internal Assessment
<p style="font-size: small; margin: 0;">Content Specific Information (texts, documents, methods)</p>	<p><b>Statement of Inquiry</b> All objects, which have mass, can have their motion described mathematically in relation to their displacement, velocity, and acceleration within a given reference frame.</p> <p><b>Phenomenon:</b> Technically, a perfectly designed roller coaster does not need harnesses.</p> <p><b>Crosscutting Concepts</b></p> <ul style="list-style-type: none"> <li>● Scale, Proportion, and Quantity</li> <li>● Systems and System Models</li> <li>● Energy and Matter</li> <li>● Cause and Effect</li> </ul> <p><b>CORE IDEAS</b></p> <ul style="list-style-type: none"> <li>● Displacement, velocity, and acceleration</li> <li>● Motion graphs</li> <li>● Kinematic equations</li> <li>● Projectile Motion</li> <li>● Free body diagrams</li> <li>● Newton’s Laws of motion</li> <li>● Types of energy</li> <li>● Power</li> <li>● Conservation of energy</li> <li>● Conservation of linear momentum</li> </ul>	<p><b>Statement of Inquiry</b> Energy cannot be created or destroyed, but studying the transfer of differing types of energy helps to describe the nature of matter.</p> <p><b>Phenomenon:</b> Energy always “evens out” causing moving things to eventually stop and temperature to equalize.</p> <p><b>Crosscutting Concepts</b></p> <ul style="list-style-type: none"> <li>● Energy and Matter</li> <li>● Cause and Effect</li> <li>● Patterns</li> <li>● Systems and System Models</li> </ul> <p><b>CORE IDEAS</b></p> <ul style="list-style-type: none"> <li>● Molecular Theory of solids, liquids, and gasses</li> <li>● Density</li> <li>● Kelvin and Celsius</li> <li>● Internal energy</li> <li>● Thermal energy</li> <li>● Phase changes</li> <li>● Energy Transfer</li> <li>● Luminosity</li> <li>● Conservation of Energy</li> <li>● Emissivity</li> <li>● Greenhouse effect</li> <li>● Gas Laws</li> </ul>	<p><b>Statement of Inquiry</b> The motion and interactions of waves can be predicted through analysis of the distinct features of each wave.</p> <p><b>Phenomenon:</b> All waves can be described in one way or another by the idea of simple harmonic motion.</p> <p><b>Crosscutting Concepts</b></p> <ul style="list-style-type: none"> <li>● Systems</li> <li>● Energy and Matter</li> </ul> <p><b>CORE IDEAS</b></p> <ul style="list-style-type: none"> <li>● Simple Harmonic Motion</li> <li>● Oscillation</li> <li>● Pendulums</li> <li>● Wave Model</li> <li>● Wavelength</li> <li>● Frequency</li> <li>● Period</li> <li>● Wave speed</li> <li>● Wavefronts and Rays</li> <li>● Snell’s Law</li> <li>● Superposition</li> <li>● Interference</li> <li>● Young’s Double Slit</li> <li>● Standing waves</li> <li>● Resonance</li> <li>● Damping</li> <li>● Doppler Effect</li> </ul>	<p>Assessments in IB Physics – Year 1 – Internal Assessment Student Investigation Proposal</p> <p>Practice IB style Exams over Year 1 Topics – simulating Paper 1 and Paper 2</p> <p>Note: The exams will be practiced throughout the year.</p> <p><b>Crosscutting Concepts:</b> ALL</p> <p><b>CORE IDEAS:</b></p> <ul style="list-style-type: none"> <li>● What is the IA?</li> <li>● Academic Integrity Policy</li> <li>● Rubrics</li> <li>● Developing a research question</li> <li>● Variable Identification</li> <li>● Methodology for individual or collaborative work</li> <li>● Research design</li> <li>● Data Analysis</li> <li>● Statistics</li> <li>● Conclusion</li> <li>● Evaluation</li> </ul> <p>*Will go over all parts of the IA and assign the design proposal only in Y1.</p>

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	<ul style="list-style-type: none"> <li>● Impulse</li> <li>● Types of collisions</li> </ul>	<ul style="list-style-type: none"> <li>● Current and circuits</li> <li>● Ohm's Law</li> </ul>		
Common Assessments/ Major Projects	<p>Internal Assessment Preparation</p> <p>Practice IB Exams</p> <p><b>SEP</b></p> <ul style="list-style-type: none"> <li>● Asking Questions and Defining Problems</li> <li>● Developing &amp; Using Models</li> <li>● Planning and Carrying out investigations</li> <li>● Analyzing &amp; interpreting data</li> <li>● Constructing Explanations</li> <li>● Use mathematics and computational thinking</li> <li>● Obtaining, evaluating and communicating information</li> </ul>	<p>Internal Assessment Preparation</p> <p>Practice IB Exams</p> <p><b>SEP</b></p> <ul style="list-style-type: none"> <li>● Asking Questions and Defining Problems</li> <li>● Developing &amp; Using Models</li> <li>● Planning and Carrying out investigations</li> <li>● Analyzing &amp; interpreting data</li> <li>● Use mathematics and computational thinking</li> <li>● Constructing Explanations</li> <li>● Obtaining, evaluating and communicating information</li> </ul>	<p>Practice IB Exams</p> <p><b>SEP</b></p> <ul style="list-style-type: none"> <li>● Asking Questions and Defining Problems</li> <li>● Developing &amp; Using Models</li> <li>● Carry out Investigations</li> <li>● Analyzing &amp; interpreting data</li> <li>● Use mathematics and computational thinking</li> <li>● Engage in Argument from Evidence</li> <li>● Obtaining, evaluating and communicating information</li> </ul>	<p>Internal Assessment Beginning</p> <p><b>SEP</b></p> <ul style="list-style-type: none"> <li>● Asking Questions and Defining Problems</li> <li>● Developing &amp; Using Models</li> <li>● Carry out Investigations</li> <li>● Analyzing &amp; interpreting data</li> <li>● Use mathematics and computational thinking</li> <li>● Engage in Argument from Evidence</li> <li>● Obtaining, evaluating and communicating information</li> </ul>
Level Specific Differentiation	<p>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.</p>			
Resources	<ul style="list-style-type: none"> <li>● Schoology Course Page</li> <li>● <a href="#">IB Physics Guide First Assessment 2025</a></li> <li>● Textbook TBD - evaluation of resources</li> <li>● Van de Lagemaat, R. <a href="http://www.inthinking.net">www.inthinking.net</a>: Andorra la Vella, Andorra, 2019</li> <li>● Discovery Education Physics Resources</li> </ul> <p>Additional resources from old syllabus</p> <ul style="list-style-type: none"> <li>● Hodder Study and Revision Guide for the IB Diploma</li> <li>● Hodder IA Internal Assessment for Physics</li> </ul>			