

## MCS IB Physics Y2 Subject Group Overview

Unit Name	Measurement and Uncertainty	Waves	Internal assessment	Electricity and Magnetism	Energy Production	Atomic and Nuclear Physics	Exams and Review
<b>Time Frame</b>	2 weeks	4 weeks	3 weeks	8 weeks	5 weeks	7 weeks	3 weeks
<b>Standards/ IB Topics</b>	1.1, 1.2, 1.3	3.1, 3.2	IA	5.1, 5.2, 5.3, 5.4	8.1, 8.2	7.1, 7.2, 7.3	All topics
<b>Content Specific Information</b> (texts, documents, methods)	<p><b>Statement of Inquiry</b> Measurement is a process of detecting an unknown physical quantity by using a standard quantity.</p> <p><b>Phenomenon:</b> A plane can “fly blind” and arrive safely at the correct location simply by using vector coordinates.</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> </ul> <p><b>CORE IDEAS</b></p> <ul style="list-style-type: none"> <li>• Units and the metric system</li> <li>• Precise measurements</li> <li>• Errors and</li> </ul>	<p><b>Statement of Inquiry</b> Energy may exist in potential, kinetic, thermal, electrical, chemical, nuclear, or other various forms..</p> <p><b>Phenomenon:</b> Waves might seem like they are moving matter but in reality, they are only moving energy.</p> <p><b>Crosscutting Concepts</b></p> <ul style="list-style-type: none"> <li>• Patterns</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>• Parts of waves</li> <li>• Transverse and longitudinal waves</li> <li>• Wave speed</li> <li>• Fronts and rays</li> <li>• Superposition</li> <li>• Polarization</li> <li>• Snell’s Law</li> <li>• Interference of waves</li> </ul>	<p><b>Scientific Investigation</b></p> <p>The IA, worth 20% of the final assessment, consists of one scientific investigation. This individual investigation will cover a topic that is commensurate with the level of the course of study.</p> <p>Assessed by the teacher, and externally moderated by the IB.</p> <p><b>IA Component</b> Duration: 10 hours Weighting: 20% Individual investigation.</p>	<p><b>Statement of Inquiry</b> The various manifestations of electricity are the result of the accumulation or motion of numbers of electrons</p> <p><b>Phenomenon:</b> Energy can be efficiently transferred through the use of moving electrons.</p> <p><b>Crosscutting Concepts</b></p> <ul style="list-style-type: none"> <li>• Cause and Effect</li> <li>• Systems and System models</li> </ul> <p><b>CORE IDEAS</b></p> <ul style="list-style-type: none"> <li>• Charges and electric fields</li> <li>• Coulomb’s Law</li> <li>• Current and Potential Difference</li> <li>• Circuits</li> <li>• Ohm’s and Kirchhoff’s Laws</li> </ul>	<p><b>Statement of Inquiry</b> Some energy will be lost to surroundings and will not be used to perform useful work.</p> <p><b>Phenomenon:</b> The Earth will run out of non-renewable energy much sooner than we think.</p> <p><b>CORE IDEAS</b></p> <ul style="list-style-type: none"> <li>• Sankey Diagrams</li> <li>• Black body radiation</li> <li>• Albedo and emissivity</li> <li>• The solar constant and greenhouse effect</li> <li>• Forms of renewable energy and resources</li> </ul>	<p><b>Statement of Inquiry</b> The energy of a photon is dependent on its frequency.</p> <p><b>Phenomenon:</b> Matter is made up of many fundamental particles.</p> <p><b>Core Ideas</b></p> <ul style="list-style-type: none"> <li>• Energy levels</li> <li>• Radioactive decay</li> <li>• Isotopes</li> <li>• Mass defect and binding energy</li> <li>• Nuclear fission and fusion</li> <li>• Quarks, lepton, and their antiparticles</li> <li>• Conservation laws</li> <li>• Exchange particles</li> <li>• Feynman diagrams</li> </ul>	<p><b>Review all previous topics</b></p> <p><b>Topics summative assessments</b></p> <p><b>Practice IB exams</b></p>

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	Uncertainties <ul style="list-style-type: none"> <li>• Vectors vs scalars</li> <li>• Combining vectors</li> </ul>	<ul style="list-style-type: none"> <li>• Standing waves</li> </ul>		<ul style="list-style-type: none"> <li>• Resistivity</li> <li>• Internal resistance of a cell</li> <li>• Magnetic fields and forces</li> </ul>			
Common Assessments/ Major Projects	Internal Assessment Preparation  Practice IB Exams  <b>SEP</b> Asking Questions and Defining Problems  Developing & Using Models  Planning and Carrying out investigations  Analyzing & interpreting data  Constructing Explanations  Use mathematics and computational thinking  Obtaining,	Internal Assessment Preparation  Practice IB Exams  <b>SEP</b> Asking Questions and Defining Problems  Developing & Using Models  Carry out Investigations  Analyzing & interpreting data  Use mathematics and computational thinking Engage in Argument from Evidence  Obtaining, evaluating and communicating information	<b>IA Criteria</b> Personal engagement:8% Exploration: 25% Analysis: 25% Evaluation: 25% Communication: 17%  Internal Assessment final report	Internal Assessment Preparation  Practice IB Exams  <b>SEP</b> Asking Questions and Defining Problems  Developing & Using Models  Carry out Investigations  Analyzing & interpreting data  Use mathematics and computational thinking  Engage in Argument from Evidence  Obtaining, evaluating and communicating information	Internal Assessment Preparation  Practice IB Exams  <b>SEP</b> Asking Questions and Defining Problems  Developing & Using Models  Carry out Investigations  Analyzing & interpreting data  Use mathematics and computational thinking  Engage in Argument from Evidence  Obtaining, evaluating and communicating information	Internal Assessment Preparation  Practice IB Exams  <b>SEP</b> Asking Questions and Defining Problems  Developing & Using Models  Carry out Investigations  Analyzing & interpreting data  Use mathematics and computational thinking  Engage in Argument from Evidence	IA and IB Exam

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	evaluating and communicating information					Obtaining, evaluating and communicating information	
<b>Level Specific Differentiation</b>	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.						
<b>Resources</b>	<ul style="list-style-type: none"> <li>Schoology Course Page</li> <li>Hodder IB Physics textbook (problems and labs)</li> </ul>	<ul style="list-style-type: none"> <li>Schoology Course Page</li> <li>Hodder IB Physics textbook (problems and labs)</li> </ul>	<ul style="list-style-type: none"> <li>Schoology Course Page</li> <li>Hodder IB Physics textbook (problems and labs)</li> </ul>	<ul style="list-style-type: none"> <li>Schoology Course Page</li> <li>Hodder IB Physics textbook (problems and labs)</li> </ul>	<ul style="list-style-type: none"> <li>Schoology Course Page</li> <li>Hodder IB Physics textbook (problems and labs)</li> </ul>	Schoology Course Page	Schoology Course Page