Course: Science and Design
Grade Level: 8
Textbook/Instructional Materials:

Month	IB Unit/Topic	Assessments and Activities	CCR and CCW	ATL Skills	Curriculum Standards and IB Criterion and Strands
September	Forces/Motion, Gravity	Activities: • How fast? This Fast? DT • Acceleration DT • Gravity Force Lab • Unit Conversions • Forces DT • Friction DT/Graphs • Phonebook Friction • Newton's 2nd Law DT Formative: • Speed/Velocity/Acceleration Quiz • Mass vs. Weight mini quiz • Gravity Force Lab • Reading Forces Quiz w/Spring Scales and Unit Conversions • Design a test to show air resistance • NASA Graphs Summative: Punkin Chunkin	*Common Core State Standards Connections: ELA/Literacy* - **RST.6-8.1** **RST.6-8.3** **WHST.6-8.1** **WHST.6-8.7**	In order for students to **Explain changes made to the chosen design and the plan when making the solution**, students must **Test generalizations and conclusions.** (ATL Category: Thinking, ATL Cluster: Critical-thinking skills) In order for students to **Analyze a group of similar products that inspire a solution to the problem**, students must **Compare, contrast and draw connections among resources.** (ATL Category: Research, ATL Cluster: Media literacy skills) In order for students to **Discuss and analyze the various implications of using science and its application in solving a specific problem or issue**, students must **Collect, record and verify data.**	Standards: MS-PS2-1, MS-PS2-2, MS-PS2-4, MS-PS2-5, MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4 IB Criterion and Strands **Criterion A: Inquiring and analyzing** ii. Construct a research plan, which states and prioritizes the primary and secondary research needed to develop a solution to the problem. iii. Analyze a group of similar products that inspire a solution to the problem. iv. Develop a design brief, which presents the analysis of relevant research. **Criterion B: Developing ideas** i. Develop a design specification which outlines the success criteria for the design of a solution based on the data collected. ii. Present a range of feasible design ideas which can be correctly interpreted by others. iii. Present the chosen design and outline the reasons for its selection. iv. Develop accurate planning drawings/diagrams and outline requirements for the creation of the chosen solution. **Criterion C: Creating the solution** i. Construct a logical plan, which outlines the efficient use of time and resources, sufficient for peers to be able to follow to create the solution. ii. Demonstrate excellent technical skills when making the solution. iii. Follow the plan to create the solution, which functions as intended. iv. Explain changes made to the chosen design and the plan when making the solution. v. Present the solution as a whole. **Criterion D: Evaluating** i. Describe detailed and relevant testing method, which generate accurate data, to measure the success of the solution. ii. Explain the success of the solution against the design specification. iii. Describe how the solution could be improved.
Month	**IB Unit/Topic**	**Assessments and Activities**	**CCR and CCW**		**Curriculum Standards and IB Criterion and Strands**
October	Forces/Motion,	Activities:	*Common*		Standards:

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	Gravity	• How fast? This Fast? DT • Acceleration DT • Gravity Force Lab • Unit Conversions • Forces DT • Friction DT/Graphs • Phonebook Friction • Newton's 2nd Law DT Formative: • Speed/Velocity/Acceleration Quiz • Mass vs. Weight mini quiz • Gravity Force Lab • Reading Forces Quiz w/Spring Scales and Unit Conversions • Design a test to show air resistance • NASA Graphs Summative: Punkin Chunkin	*Core State Standards Connections: ELA/Literacy* - **RST.6-8.1** **RST.6-8.3** **WHST.6-8.1** **WHST.6-8.7**	(ATL Category: Research, ATL Cluster: Information literacy Skills) In order for students to **Apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations**, students must **Gather and organize relevant information to formulate an argument**. (ATL Category: Thinking, ATL Cluster: Critical-thinking skills)	IB Criterion and Strands
Month	**IB Unit/Topic**	**Assessments and Activities**	**CCR and CCW**	**ATL Skills**	**Curriculum Standards and IB Criterion and Strands**
November	Kinetic Energy	Activities: • What is energy DT • Energy Part 1/2 DT • Coaster Problem • Kinetic/Potential Graphs Formative: • Chapter 5 Section 1 Quiz • Chapter 5 Section 3 Quiz • Coaster Problem Summative: Roller Coaster	*Common Core State Standards Connections: ELA/Literacy* - **RST.6-8.1** **RST.6-8.3** **RST.6-8.7** **WHST.6-8.1** **WHST.6-8.7** **SL.8.5**	In order for students to **Apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations**, students must **Gather and organize relevant information to formulate an argument.** (ATL Category: Thinking, ATL Cluster: Critical Thinking Skills) In order for students to **Describe how to manipulate the variables and describe how data will be collected**, students must **Create plans to prepare for summative assessments.** (ATL	Standards: MS-PS3-1, MS-PS3-5 IB Criterion and Strands **Criterion A: Knowing and Understanding** ii. Apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations **Criterion B: Inquiring and Designing** iii. Describe how to manipulate the variables and describe how data will be collected **Criterion C: Processing and Evaluating** i. Present collected and transformed data
Month	**IB Unit/Topic**	**Assessments and Activities**	**CCR and CCW**		**Curriculum Standards and IB Criterion and Strands**

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December	Kinetic Energy	Activities: • What is energy DT • Energy Part 1/2 DT • Coaster Problem • Kinetic/Potential Graphs Formative: • Chapter 5 Section 1 Quiz • Chapter 5 Section 3 Quiz • Coaster Problem Summative: Roller Coaster	*Common Core State Standards Connections: ELA/Literacy* - **RST.6-8.1** **RST.6-8.3** **RST.6-8.7** **WHST.6-8.1** **WHST.6-8.7** **SL.8.5**	Category: Self-Management, ATL Cluster: Organization Skills) In order for students to **Present collected and transformed data**, students must **Use appropriate forms of writing for different purposes and audiences.** (ATL Category: Communication, ATL Cluster: Communication Skills) In order for students to **Interpret data and describe results using scientific reasoning**, students must **Draw reasonable conclusions and generalizations.** (ATL Category: Thinking, ATL Cluster: Critical-thinking Skills)	Standards: IB Criterion and Strands
Month	**IB Unit/Topic**	**Assessments and Activities**	**CCR and CCW**	**ATL Skills**	**Curriculum Standards and IB Criterion and Strands**
January	Chemical Reactions and the Atom	Activities: • Volume DT • Tea Light Density DT • Conversion practice • Chemical Reactions Lab • Massing Chemical Reactions • Atoms vs. Molecules • Building an Atom DT Formative: • Volume Quiz • Blueprint Conversions • Physical and Chemical Properties Quiz • Conservation of Mass Quiz • Atom vs. Molecule Quiz • Modern Atomic Theory Quiz Summative: Law of Conservation	*Common Core State Standards Connections: ELA/Literacy* - **RST.6-8.1** **RST.6-8.3** **RST.6-8.7** **WHST.6-8.7**	In order for students to **Describe scientific knowledge**, students must **Structure information in summaries, essays and reports.** (ATL Category: Communication, ATL Cluster: Communication Skills) In order for students to **Apply scientific language effectively**, students must **Apply existing knowledge to generate new ideas, products or processes.** (ATL Category: Thinking, ATL Cluster: Creating-thinking	Standards: MS-PS1-1, MS-PS1-2, MS-PS1-5, MS-ETS1-1, MS-ETS1-2 IB Criterion and Strands **Criterion A: Knowing and understanding** i. Describe scientific knowledge ii. Apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations iii. Analyze information to make scientifically supported judgments **Criterion B: Inquiring and Designing** iv. Design scientific investigations **Criterion C: Processing and Evaluating** i. Present collected and transformed data ii. Interpret data and describe results using scientific reasoning

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		lesson/Atomic Model		Skills) In order for students to **Document the work of others and sources of information used**, students must **Identify primary and secondary sources.** (ATL Category: Research, ATL Cluster: Information literacy Skills) In order for students to **Design scientific investigations**, students must **Use brainstorming and visual diagrams to generate new ideas and inquiries.** (ATL Category: Thinking, ATL Cluster: Creative Thinking Skills)	**Criterion D: Reflecting on the Impacts of Science** iii. Apply scientific language effectively iv. Document the work of others and sources of information used
Month	**IB Unit/Topic**	**Assessments and Activities**	**CCR and CCW**		**Curriculum Standards and IB Criterion and Strands**
February	Chemical Reactions and the Atom	Activities: • Volume DT • Tea Light Density DT • Conversion practice • Chemical Reactions Lab • Massing Chemical Reactions • Atoms vs. Molecules • Building an Atom DT Formative: • Volume Quiz • Blueprint Conversions • Physical and Chemical Properties Quiz • Conservation of Mass Quiz • Atom vs. Molecule Quiz • Modern Atomic Theory Quiz Summative: Law of Conservation lesson/Atomic Model	*Common Core State Standards Connections: ELA/Literacy* - **RST.6-8.1** **RST.6-8.3** **RST.6-8.7** **WHST.6-8.7**		Standards: IB Criterion and Strands
Month	**IB Unit/Topic**	**Assessments and Activities**	**CCR and CCW**	**ATL Skills**	**Curriculum Standards and IB Criterion and Strands**
March	States of Matter	Activities: • States of Matter DT • Change of State graph • Adding Energy worksheet Formative: • States of matter illustration Quiz • Changes of State Quiz Summative: States of Matter Poster	*Common Core State Standards Connections: ELA/Literacy* - **RST.6-8.1** **RST.6-8.7** **WHST.6-8.8**	In order for students to **Describe scientific knowledge**, students must **Structure information in summaries, essays and reports.** (ATL Category: Communication, ATL Cluster: Communication Skills) In order for students to **Analyze information to make scientifically supported judgments**, students must **Interpret data.** (ATL Category: Thinking, ATL Cluster: Critical-thinking Skills)	Standards: MS-PS1-4, MS-PS3-4 IB Criterion and Strands **Criterion A: Knowing and Understanding** i. Describe scientific knowledge iii. Analyze information to make scientifically supported judgments **Criterion B: Inquiring and Designing** i. Describe a problem or question to be tested by a scientific investigation **Criterion C: Processing and Evaluating** i. Present collected and transformed data ii. Interpret data and describe results using scientific reasoning **Criterion D: Reflecting on the impacts of Science** i. Describe the ways in which science is applied and used to address a specific problem or issue

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				In order for students to **Present collected and transformed data**, students must **Use appropriate forms of writing for different purposes and audiences.** (ATL Category: Communication, ATL Cluster: Communication Skills)	iii. Apply scientific language effectively
Month	**IB Unit/Topic**	**Assessments and Activities**	**CCR and CCW**	**ATL Skills**	**Curriculum Standards and IB Criterion and Strands**
April	Human Impact/Natural Resources	Activities: • Natural Sources vs. Human Sources • Smog • Climate Regions • Climate change timeline • 7 Billion people and growing • Climate change argument paper • McDonalds Beef Formative: • Natural sources and human sources chart • Timeline • Connections web • Argument paper Summative: Human Impact Solution	*Common Core State Standards Connections: ELA/Literacy* - **RST.6-8.1** **RST.6-8.7** **WHST.6-8.1** **WHST.6-8.7** **WHST.6-8.8** **WHST.6-8.9**	In order for students to **Apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations**, students must **Identify obstacles and challenges.** (ATL Category: Thinking, ATL Cluster: Critical thinking skills) In order for students to **Analyze information to make scientifically supported judgements**, students must **Interpret data.** (ATL Category: Thinking, ATL Cluster: Critical thinking skills) In order for students to **Describe a problem or question to be tested by a scientific investigation**, students must **Collect and analyze data to identify solutions and make informed decisions.** (ATL Category: Research, ATL Cluster: Information literacy skills)	Standards: MS-ESS3-3, MS-ESS3-4, MS-ESS3-5 IB Criterion and Strands **Criterion A: Knowing and Understanding** ii. Apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations iii. Analyze information to make scientifically supported judgements **Criterion B: Inquiring and Designing** i. Describe a problem or question to be tested by a scientific investigation **Criterion C: Processing and Evaluating** **Criterion D: Reflecting on the Impacts of Science** i. Describe the ways in which science is applied and used to address a specific problem or issue ii. Discuss and analyze the various implication of using science and its application in solving a specific problem or issue iv. Document the work of others and sources of information used
Month	**IB Unit/Topic**	**Assessments and Activities**	**CCR and CCW**		**Curriculum Standards and IB Criterion and Strands**
May	Human Impact/Natural Resources	Activities: • Natural Sources vs. Human Sources • Smog • Climate Regions • Climate change timeline • 7 Billion people and growing • Climate change argument paper	*Common Core State Standards Connections: ELA/Literacy* - **RST.6-8.1** **RST.6-8.7**		Standards: IB Criterion and Strands

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Textbook/Instructional Materials:

		• McDonalds Beef Formative: • Natural sources and human sources chart • Timeline • Connections web • Argument paper Summative: Human Impact Solution	**WHST.6-8.1** **WHST.6-8.7** **WHST.6-8.8** **WHST.6-8.9**	In order for students to **Describe the ways in which science is applied and used to address a specific problem or issue**, students must **Access information to be informed and inform others.** (ATL Category: Research, ATL Cluster: Information literacy skills) In order for students to **Discuss and analyze the various implication of using science and its application in solving a specific problem or issue**, students must **Seek a range of perspectives from multiple and varied sources.** (ATL Category: Research, ATL Cluster: Media literacy skills) In order for students to **Document the work of others and sources of information used**, students must **Identify primary and secondary sources.** (ATL Category: Research, ATL Cluster: Information literacy skills)	Write arguments focused on discipline content. (MS-ESS3-4) Conduct short research projects to answer a question (including a self-generated question), drawing on several sou generating additional related, focused questions that allow for multiple avenues of exploration. (MS-ESS3-3) Gather relevant information from multiple print and digital sources, using search terms effectively; assess the cred accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism an a standard format for citation. (MS-ESS3-3) Draw evidence from informational texts to support analysis, reflection, and research. (MS-ESS3-4)
Month	**IB Unit/Topic**	**Assessments and Activities**	**CCR and CCW**	**ATL Skills**	**Curriculum Standards and IB Criterion and Strands**
June	Electricity and Magnetism	Activities: • Phet balloon simulation • Conductors and insulators • Electric cars vs combustion cars • Circuit challenge • Requirements of a circuit Formative: • Conductors and insulators exit ticket • Circuit challenge	*Common Core State Standards Connections: ELA/Literacy -* **RST.6-8.1** **RST.6-8.3**	In order for students to **Analyze information to make scientifically supported judgments**, students must **Interpret data.** (ATL Category: Thinking, ATL Cluster: Critical Thinking Skills)	Standards: MS-PS2-3, MS-PS2-5 IB Criterion and Strands **Criterion A: Knowing and Understanding** ii. Describe scientific knowledge iii. Apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations

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Textbook/Instructional Materials:

		• Circuit Quiz • Requirements of a circuit writing • Argument paper Summative: Light House	**WHST.6-8.1** **WHST.6-8.7**	In order for students to **Outline a testable hypothesis and explain it using scientific reasoning**, students must **Use appropriate strategies for organizing complex information.** (ATL Category: Self-Management, ATL Cluster: Organization Skills) In order for students to **Describe improvement or extensions to the method**, students must **Develop new skills, techniques and strategies for effective learning.** (ATL Category: Self-management, ATL Cluster: Reflective skills)	Write arguments focused on *discipline-specific content.* (MS-PS2-4) Conduct short research projects that use evidence to answer a question (including a self-generated question), or test a solution to a problem. (MS-PS2-3) **Criterion B: Inquiring and Designing** ii. Describe a problem or question to be tested by a scientific investigation iii. Outline a testable hypothesis and explain it using scientific reasoning iv. Describe how to manipulate the variables and describe how data will be collected v. Design scientific investigations **Criterion C: Processing and Evaluating** iv. Present collected and transformed data v. Interpret data and describe results using scientific reasoning vi. Describe improvement or extensions to the method

Criterion B: Inquiring and Designing
generating additional related, focused questions that allow for multiple avenues of exploration. *(MS-PS2-1)*,(MS-PS