

# GREEN TOWNSHIP SCHOOL DISTRICT



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**Content Area:** Science  
**Course/Grade Level:** 6-8

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**Curriculum Committee Members:**

**Principal:**

Jon Paul Bollette

**Board Approval Date:**

{Fill in when known}

## Key Performance and Benchmark Tasks/Assessments

### Resources for help in creating assessments

#### **Formative assessments:**

- Teacher observation of students engaged in group and independent activities.
- Individual and small group conferences/interviews to assess understanding with rubric
- Self-assessment by students with guidance from teacher.

#### **Summative Assessments:**

- Teacher created assessments and projects
- Teacher/District created benchmark assessments

#### **Benchmark Assessments:**

- Teacher-created benchmark assessments to be given periodically during the year.

#### **Alternative Assessments:**

- Teacher modifies assignments and activities based on student needs.
- Oral assessments administered in place of written when necessary.
- Accommodation and modification ideas may be found here:
  - [Modifications & Accommodations Menu](#)
  - *Assessments other than paper & pencil tests See link for more info:*  
[http://education.qmu.edu/assets/docs/forms/mirs/assessment\\_brochure.pdf](http://education.qmu.edu/assets/docs/forms/mirs/assessment_brochure.pdf)

## Integrated Accommodations & Modifications

Please utilize the link below for ideas and strategies to use with ***ELL, Students with IEPs & 504s, At-Risk Students and Gifted & Talented Students.***

The attached worksheets can be printed ahead of each unit during the planning phase to help the teacher plan for the needs of particular students in each class, allowing for differentiation per unit and per year. The worksheets contain suggested accommodations and modifications for Content & Material, Student Organization, Instructional Strategies, Assessments, Attention/Focus, Written Language, and Social/Behavioral.

[Modifications & Accommodations Menu](#)

## 6th Grade

Pacing: 3 weeks		<b>Unit 1: Ecology: Matter and Energy and the Environment</b>	
<b>Standards and Suggested Activities</b>		<b>Skills and Knowledge</b>	
<p>MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.</p> <p>MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems</p> <p>MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● C-O lab</li> <li>● nitrogen cycle lab</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● describe the role of biotic and abiotic factors in an ecosystem.</li> <li>● diagram and explain the water, nitrogen, carbon, and oxygen cycles.</li> <li>● explain how an organism can have a niche in multiple ecosystems.</li> <li>● identify the role of decomposers in the cycling of matter.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	
<b>District/School Formative Assessment Plan</b>		<b>District/School Summative Assessment Plan</b>	
<ul style="list-style-type: none"> <li>● Class discussions in which student share prior knowledge</li> <li>● Study Island</li> <li>● Quizzes</li> </ul>		<ul style="list-style-type: none"> <li>● Teacher-created quizzes</li> <li>● Teacher-created unit assessments</li> <li>● Labs</li> </ul>	
<b>Core Instructional Materials</b>		<b>District/School Supplementary Resources</b>	
<ul style="list-style-type: none"> <li>● <i>Glencoe iScience Life Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>● Discovery Education videos</li> <li>● Glencoe ConnectEd online resources</li> </ul>	

## Interdisciplinary Connections throughout the K-12 Curriculum

### [Appendix: Reading & Writing Companion Standards for Science](#)

#### **Mathematics**

**6.EE.C.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS2-3)

**6.SP.B.5** Summarize numerical data sets in relation to their context. (MS-LS2-2)

#### **English-Language Arts:**

**RI.6.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.

**W.6.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia) when useful to aiding comprehension.

B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.

C. Use appropriate transitions to clarify the relationships among ideas and concepts.

D. Use precise language and domain-specific vocabulary to inform about or explain the topic.

E. Establish and maintain a formal/academic style, approach, and form.

F. Provide a concluding statement or section that follows from the information or explanation presented.

**W.6.4.** Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

**W.6.7.** Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate. **W.6.8.** Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.

**SL.6.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

A. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

B. Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.

C. Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.

D. Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing. **SL.6.2.** Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

**SL.6.3.** Deconstruct a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.

*SL.6.4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate speaking behaviors (e.g., eye contact, adequate volume, and clear pronunciation).*

*SL.6.5. Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.*

*SL.6.6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.*

**Integration of 21st Century Themes and Skills**

21st Century Skills/ Career Ready Practices:

- CRP1. Act as a responsible and contributing citizen and employee**
  - CRP2. Apply appropriate academic and technical skills.**
  - CRP3. Attend to personal health and financial well-being.**
  - CRP4. Communicate clearly and effectively and with reason.**
  - CRP5. Consider the environmental, social and economic impacts of decisions.**
  - CRP6. Demonstrate creativity and innovation.**
  - CRP7. Employ valid and reliable research strategies.**
  - CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**
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  - CRP11. Use technology to enhance productivity.**
  - CRP12. Work productively in teams while using cultural global competence.**
- [Link to GHS Career Standards 9.2Crosswalk Doc](#)

**2014 Technology Standards**

2014 NJ Technology Standards:

- 8.1 Educational Technology** ([Word](#) | [PDF](#))  
 All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
- 8.2 Technology Education, Engineering, Design and Computational Thinking - Programming** ([Word](#) | [PDF](#))  
 All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
- Please see relevant projects for technology standards [8.1](#) and [8.2](#):

## Differentiation / Accommodations / Modifications

[See Appendix 3: Differentiation - Modifications - Accommodations](#)

Pacing: 4 weeks		Unit 2: Ecology: Interactions of Organisms in an Ecosystem	
Standards and Suggested Activities		Skills and Knowledge	
<p>MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.</p> <p>MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems</p> <p>MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.</p> <p>MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.</p> <p>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.</p> <p>MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● predator- prey activity</li> <li>● predator- prey graphs</li> <li>● competition graphs</li> <li>● natural selection/ camouflage toothpick lab</li> <li>● sustainable fishing activity (6th grade edition- with cost control)</li> <li>● owl pellet lab</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● describe and give examples for the various trophic levels of the energy pyramid.</li> <li>● interpret and draw conclusions regarding how competition affects population size.</li> <li>● distinguish between predator-prey and symbiotic relationships among organisms.</li> <li>● interpret and draw conclusions from predator-prey graphs.</li> <li>● describe how natural selection affects the size of a population.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	

<p>account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.</p> <p>MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.</p> <p>MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.</p> <p>MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.</p>		
<p><b>District/School Formative Assessment Plan</b></p>	<p><b>District/School Summative Assessment Plan</b></p>	
<ul style="list-style-type: none"> <li>● Class discussions in which student share prior knowledge</li> <li>● Study Island</li> <li>● Quizzes</li> </ul>	<ul style="list-style-type: none"> <li>● Teacher-created quizzes</li> <li>● Teacher-created unit assessments</li> <li>● Labs</li> </ul>	
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**Interdisciplinary Connections throughout the K-12 Curriculum**

- [Appendix: Reading & Writing Companion Standards for Science](#)

**Mathematics**

**MP.2** Reason abstractly and quantitatively. (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3),(MS-ETS1-4)

**MP.4** Model with mathematics. (MS-LS2-5)(MS-LS4-6)

**6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems. (MS-LS2-5)

**6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-LS4-6)

**6.SP.B.5** Summarize numerical data sets in relation to their context. (MS-LS4-6)

**7.RP.A.2** Recognize and represent proportional relationships between quantities. (MS-LS4-6)

**7.EE.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3)

**7.SP** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. (MS-ETS1-4)

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- Please see relevant projects for technology standards [8.1](#) and [8.2](#):

**Differentiation / Accommodations / Modifications**

[See Appendix 3: Differentiation - Modifications - Accommodations](#)

<b>Pacing: 4 weeks</b>		<b>Unit 3: Ecology: Ecosystems and Biomes</b>	
<b>Standards and Suggested Activities</b>		<b>Skills and Knowledge</b>	
<p>MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms</p> <p>MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.</p> <p>MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems</p> <p>MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.</p> <p>MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.</p> <p>MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● Trout in the classroom program</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● describe climate in terms of rainfall and temperature.</li> <li>● identify temperature dependent land biomes and their characteristics.</li> <li>● identify moisture dependent land biomes and their characteristics.</li> <li>● identify the limiting factors that affect populations in various biomes.</li> <li>● describe population movement between biomes.</li> <li>● identify various saltwater and freshwater biomes and their characteristics.</li> <li>● describe the process of ecological succession.</li> <li>● distinguish between primary and secondary succession.</li> <li>● explain how eutrophication occurs and identify ways to minimize human impact.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	
<b>District/School Formative Assessment Plan</b>		<b>District/School Summative Assessment Plan</b>	

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<b>Interdisciplinary Connections throughout the K-12 Curriculum</b>
<ul style="list-style-type: none"> <li>• <a href="#">Appendix: Reading &amp; Writing Companion Standards for Science</a></li> </ul> <p><b><u>Mathematics</u></b></p> <p><i>MP.2 Reason abstractly and quantitatively. (MS-ESS1-3)</i></p> <p><i>MP.4 Model with mathematics. (MS-LS2-5)</i></p> <p><i>6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1)</i></p> <p><i>6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. (MS-LS1-5)</i></p> <p><i>6.SP.B.4 Summarize numerical data sets in relation to their context. (MS-LS1-5)</i></p> <p><i>6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems. (MS-LS2-5)</i></p> <p><i>6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-ESS1-3)</i></p> <p><i>6.SP.B.5 Summarize numerical data sets in relation to their context. (MS-LS2-2)</i></p> <p><i>7.RP.A.2 Recognize and represent proportional relationships between quantities. (MS-ESS1-3)</i></p> <p><b><u>English-Language Arts:</u></b></p> <p><i>RI.6.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.</i></p> <p><i>W.6.2. Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</i></p> <p><i>A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia) when useful to aiding comprehension.</i></p> <p><i>B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.</i></p> <p><i>C. Use appropriate transitions to clarify the relationships among ideas and concepts.</i></p> <p><i>D. Use precise language and domain-specific vocabulary to inform about or explain the topic.</i></p> <p><i>E. Establish and maintain a formal/academic style, approach, and form.</i></p> <p><i>F. Provide a concluding statement or section that follows from the information or explanation presented.</i></p> <p><i>W.6.4. Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)</i></p>

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	<p><b>8.2 Technology Education, Engineering, Design and Computational Thinking - Programming</b>  <a href="#">(Word   PDF)</a>  All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.</p> <p>Please see relevant projects for technology standards <a href="#">8.1</a> and <a href="#">8.2</a>:</p>
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<b>Pacing: 3 weeks</b>		<b>Unit 4: Waves and Their Applications</b>	
<b>Standards and Suggested Activities</b>		<b>Skills and Knowledge</b>	
<p>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.</p> <p>MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.</p> <p>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.</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● String telephone sound lab</li> <li>● Laser target lab</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● distinguish between mechanical and electromagnetic (EM) waves.</li> <li>● distinguish between transverse and longitudinal waves.</li> <li>● describe a wave in terms of amplitude, wavelength, and frequency.</li> <li>● explain how wave speed is affected by the medium through which it travels.</li> <li>● compare and contrast the absorption, transmission, reflection, refraction, and diffraction of waves in various mediums.</li> <li>● identify the various types of wave interference.</li> <li>● distinguish between digital and analog signals.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b>  <a href="#">Matrix of Science &amp; Engineering Practices</a>  <a href="#">Matrix of Disciplinary Core Ideas</a>  <a href="#">Matrix of Crosscutting Concepts</a></p>	

District/School Formative Assessment Plan	District/School Summative Assessment Plan
<ul style="list-style-type: none"> <li>• Class discussions in which student share prior knowledge</li> <li>• Study Island</li> <li>• Quizzes</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher-created quizzes</li> <li>• Teacher-created unit assessments</li> <li>• Labs</li> </ul>
Core Instructional Materials	District/School Supplementary Resources
<ul style="list-style-type: none"> <li>• <i>Glencoe iScience Physical Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>	<ul style="list-style-type: none"> <li>• Discovery Education videos</li> <li>• Glencoe ConnectEd online resources</li> </ul>

Interdisciplinary Connections throughout the K-12 Curriculum
<ul style="list-style-type: none"> <li>• <a href="#">Appendix: Reading &amp; Writing Companion Standards for Science</a></li> </ul> <p><b><u>Mathematics</u></b>  <i>MP.2 Reason abstractly and quantitatively. (MS-PS4-1)</i>  <i>MP.4 Model with mathematics. (MS-PS4-1)</i>  <b>6.RP.A.1</b> Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-PS4-1)  <b>6.RP.A.3</b> Use ratio and rate reasoning to solve real-world and mathematical problems. (MS-PS4-1)  <b>7.RP.A.2</b> Recognize and represent proportional relationships between quantities. (MS-PS4-1)  <b>8.F.A.3</b> Interpret the equation <math>y = mx + b</math> as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. (MS-PS4-1)</p> <p><b><u>English-Language Arts:</u></b>  <b>RI.6.4.</b> Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.  <b>W.6.2.</b> Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.  <i>A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia) when useful to aiding comprehension.</i>  <i>B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.</i>  <i>C. Use appropriate transitions to clarify the relationships among ideas and concepts.</i>  <i>D. Use precise language and domain-specific vocabulary to inform about or explain the topic.</i>  <i>E. Establish and maintain a formal/academic style, approach, and form.</i>  <i>F. Provide a concluding statement or section that follows from the information or explanation presented.</i>  <b>W.6.4.</b> Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)  <b>W.6.7.</b> Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate. <b>W.6.8.</b> Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.  <b>SL.6.1.</b> Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.  <i>A. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to</i></p>

probe and reflect on ideas under discussion.

B. Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.

C. Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.

D. Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing. **SL.6.2.** Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

**SL.6.3.** Deconstruct a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.

**SL.6.4.** Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate speaking behaviors (e.g., eye contact, adequate volume, and clear pronunciation).

**SL.6.5.** Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

**SL.6.6.** Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

### Integration of 21st Century Themes and Skills

#### 21st Century Skills/ Career Ready Practices:

**CRP1. Act as a responsible and contributing citizen and employee.**

**CRP2. Apply appropriate academic and technical skills.**

**CRP3. Attend to personal health and financial well-being.**

**CRP4. Communicate clearly and effectively and with reason.**

**CRP5. Consider the environmental, social and economic impacts of decisions.**

**CRP6. Demonstrate creativity and innovation.**

**CRP7. Employ valid and reliable research strategies.**

**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**

**CRP9. Model integrity, ethical leadership and effective management.**

**CRP10. Plan education and career paths aligned to personal goals.**

**CRP11. Use technology to enhance productivity.**

**CRP12. Work productively in teams while using cultural global competence.**

[Link to GHS Career Standards 9.2 Crosswalk Doc](#)

### 2014 Technology Standards

#### 2014 NJ Technology Standards:

**8.1 Educational Technology ([Word](#) | [PDF](#))**

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

**8.2 Technology Education, Engineering, Design and Computational Thinking - Programming ([Word](#) | [PDF](#))**

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

	Please see relevant projects for technology standards <a href="#">8.1</a> and <a href="#">8.2</a> :
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**Differentiation / Accommodations / Modifications**

[See Appendix 3: Differentiation - Modifications - Accommodations](#)

<b>Pacing: 5 weeks</b>		<b>Unit 5: Electrical Energy</b>	
<b>Standards and Suggested Activities</b>		<b>Skills and Knowledge</b>	
<p>MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.</p> <p>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.</p> <p>MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● charging lab</li> <li>● circuits lab</li> <li>● appliances lab</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● identify parts of an atom and their charges.</li> <li>● describe electricity in terms of the movement of electrons.</li> <li>● make distinctions between static and current electricity.</li> <li>● describe the interaction of electric forces as a result of distance and strength of charge.</li> <li>● create charge by using friction, conduction, and induction.</li> <li>● describe how lightning forms.</li> <li>● build a simple circuit and identify its parts.</li> <li>● measure and identify voltage, current, and resistance in a circuit.</li> <li>● Use Ohm’s Law.</li> <li>● compare direct and alternating current.</li> <li>● build and compare the effectiveness and use of series and parallel circuits.</li> <li>● describe electrical safety devices.</li> </ul>	<p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p>

		<a href="#">Matrix of Crosscutting Concepts</a>
<b>District/School Formative Assessment Plan</b>		<b>District/School Summative Assessment Plan</b>
<ul style="list-style-type: none"> <li>• Class discussions in which student share prior knowledge</li> <li>• Study Island</li> <li>• Quizzes</li> </ul>		<ul style="list-style-type: none"> <li>• Teacher-created quizzes</li> <li>• Teacher-created unit assessments</li> <li>• Labs</li> </ul>
<b>Core Instructional Materials</b>		<b>District/School Supplementary Resources</b>
<ul style="list-style-type: none"> <li>• <i>Glencoe iScience Physical Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>• Discovery Education videos</li> <li>• Glencoe ConnectEd online resources</li> </ul>

<b>Interdisciplinary Connections throughout the K-12 Curriculum</b>	
<ul style="list-style-type: none"> <li>• <a href="#">Appendix: Reading &amp; Writing Companion Standards for Science</a></li> </ul>	
<p><b><u>Mathematics</u></b>  <b>MP.2</b> Reason abstractly and quantitatively. (MS-PS2-3)</p>	
<p><b><u>English-Language Arts:</u></b>  <b>RI.6.4.</b> Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.  <b>W.6.2.</b> Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.  <i>A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia) when useful to aiding comprehension.</i>  <i>B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.</i>  <i>C. Use appropriate transitions to clarify the relationships among ideas and concepts.</i>  <i>D. Use precise language and domain-specific vocabulary to inform about or explain the topic.</i>  <i>E. Establish and maintain a formal/academic style, approach, and form.</i>  <i>F. Provide a concluding statement or section that follows from the information or explanation presented.</i>  <b>W.6.4.</b> Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)  <b>W.6.7.</b> Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate. <b>W.6.8.</b> Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.</p>	

**SL.6.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

A. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

B. Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.

C. Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.

D. Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing. **SL.6.2.** Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

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#### Integration of 21st Century Themes and Skills

##### 21st Century Skills/ Career Ready Practices:

- CRP1. Act as a responsible and contributing citizen and employee.
  - CRP2. Apply appropriate academic and technical skills.
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  - CRP6. Demonstrate creativity and innovation.
  - CRP7. Employ valid and reliable research strategies.
  - CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
  - CRP9. Model integrity, ethical leadership and effective management.
  - CRP10. Plan education and career paths aligned to personal goals.
  - CRP11. Use technology to enhance productivity.
  - CRP12. Work productively in teams while using cultural global competence.
- [Link to GHS Career Standards 9.2 Crosswalk Doc](#)

#### 2014 Technology Standards

##### 2014 NJ Technology Standards:

- 8.1 Educational Technology** ([Word](#) | [PDF](#))  
All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
- 8.2 Technology Education, Engineering, Design and Computational Thinking - Programming** ([Word](#) | [PDF](#))  
All students will develop an understanding of the nature and impact of technology, engineering,

technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Please see relevant projects for technology standards [8.1](#) and [8.2](#):

### Differentiation / Accommodations / Modifications

[See Appendix 3: Differentiation - Modifications - Accommodations](#)

Pacing: 5 weeks		Unit 6: Magnetic Forces	
Standards and Suggested Activities		Skills and Knowledge	
<p>MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.</p> <p>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</p> <p>MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● magnetic materials lab</li> <li>● magnetic fields lab</li> <li>● magnetosphere activity</li> <li>● electromagnetic lab</li> <li>● electric motor lab</li> <li>● power plant activity</li> <li>● transformer demo</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● describe a magnetic field in terms of a non-contact force.</li> <li>● define a magnet in terms of its poles and domains.</li> <li>● determine the properties of magnetic materials.</li> <li>● demonstrate the interactions from two or more different magnetic fields.</li> <li>● describe Earth's magnetic field (magnetosphere) and its importance.</li> <li>● identify the relationship between magnetism and electricity.</li> <li>● create and use an electromagnet.</li> <li>● create and use an electric motor.</li> <li>● identify and describe the energy transformations that occur in electromagnets and motors.</li> <li>● describe and demonstrate how current electricity is created from electromagnetic induction.</li> <li>● trace the energy transformations that occur in a power plant.</li> <li>● categorize renewable and nonrenewable energy resources.</li> <li>● trace and describe the use of voltage transformers.</li> </ul>	<p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p>

		<a href="#">Matrix of Crosscutting Concepts</a>
<b>District/School Formative Assessment Plan</b>		<b>District/School Summative Assessment Plan</b>
<ul style="list-style-type: none"> <li>• Class discussions in which student share prior knowledge</li> <li>• Study Island</li> <li>• Quizzes</li> </ul>		<ul style="list-style-type: none"> <li>• Teacher-created quizzes</li> <li>• Teacher-created unit assessments</li> <li>• Labs</li> </ul>
<b>Core Instructional Materials</b>		<b>District/School Supplementary Resources</b>
<ul style="list-style-type: none"> <li>• <i>Glencoe iScience Physical Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>• Discovery Education videos</li> <li>• Glencoe ConnectEd online resources</li> </ul>

<b>Interdisciplinary Connections throughout the K-12 Curriculum</b>	
<a href="#">Appendix: Reading &amp; Writing Companion Standards for Science</a>	
<b><u>Mathematics</u></b>	
<i>MP.2 Reason abstractly and quantitatively. (MS-PS2-3)</i>	
<b><u>English-Language Arts:</u></b>	
<i>RI.6.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.</i>	
<i>W.6.2. Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</i>	
<i>A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia) when useful to aiding comprehension.</i>	
<i>B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.</i>	
<i>C. Use appropriate transitions to clarify the relationships among ideas and concepts.</i>	
<i>D. Use precise language and domain-specific vocabulary to inform about or explain the topic.</i>	
<i>E. Establish and maintain a formal/academic style, approach, and form.</i>	
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<i>W.6.7. Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate. W.6.8. Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.</i>	
<i>SL.6.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.</i>	

- A. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.
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#### Integration of 21st Century Themes and Skills

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- [Link to GHS Career Standards 9.2 Crosswalk Doc](#)

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All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
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All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual,

global society, and the environment.

**Differentiation / Accommodations / Modifications**

[See Appendix 3: Differentiation - Modifications - Accommodations](#)

<b>Pacing: 3 weeks</b>		<b>Unit 7: Geology- Plate Tectonics</b>	
<b>Standards and Suggested Activities</b>		<b>Skills and Knowledge</b>	
<p>MS-ESS2-1. Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process</p> <p>MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales</p> <p>MS-ESS2-3. Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.</p> <p>MS-ESS1-4. Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth’s 4.6-billion-year-old history.</p> <p>MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● magnetic striping activity</li> <li>● plate boundary pudding activity</li> <li>● plate tectonics model activity</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● describe the theory of Continental Drift and supporting evidence.</li> <li>● identify evidence for and explain the process of seafloor spreading.</li> <li>● diagram and describe the layers of the Earth.</li> <li>● identify and describe the geological processes involved in plate tectonics.</li> <li>● describe the rock cycle.</li> <li>● describe how weathering and the passage of time affect geological formations i.e. the abyssal plain, mountains)</li> <li>● describe the interactions of forces along plate boundaries.</li> <li>● name and explain the resultant landforms along plate boundaries.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	

groundwater resources are the result of past and current geoscience processes.		
<b>District/School Formative Assessment Plan</b>	<b>District/School Summative Assessment Plan</b>	
<ul style="list-style-type: none"> <li>• Class discussions in which student share prior knowledge</li> <li>• Study Island</li> <li>• Quizzes</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher-created quizzes</li> <li>• Teacher-created unit assessments</li> <li>• Labs</li> </ul>	
<b>Core Instructional Materials</b>	<b>District/School Supplementary Resources</b>	
<ul style="list-style-type: none"> <li>• <i>Glencoe iScience Earth and Space Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>	<ul style="list-style-type: none"> <li>• Discovery Education videos</li> <li>• Glencoe ConnectEd online resources</li> </ul>	

<b>Interdisciplinary Connections throughout the K-12 Curriculum</b>
<p><a href="#">Appendix: Reading &amp; Writing Companion Standards for Science</a></p> <p><b><u>Mathematics:</u></b></p> <p><i>MP.2 Reason abstractly and quantitatively. (MS-ESS2-2),(MS-ESS2-3)</i></p> <p><b>6.EE.B.6</b> Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-ESS1-4)(MS-ESS2-2),(MS-ESS2-3) (MS-ESS3-1)</p> <p><b>7.EE.B.4</b> Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. (MS-ESS1-4)(MS-ESS2-2),(MS-ESS2-3)(MS-ESS3-1)</p> <p><b><u>English-Language Arts:</u></b></p> <p><b>RI.6.4.</b> Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.</p> <p><b>W.6.2.</b> Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</p> <p><i>A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia) when useful to aiding comprehension.</i></p> <p><i>B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.</i></p> <p><i>C. Use appropriate transitions to clarify the relationships among ideas and concepts.</i></p> <p><i>D. Use precise language and domain-specific vocabulary to inform about or explain the topic.</i></p> <p><i>E. Establish and maintain a formal/academic style, approach, and form.</i></p> <p><i>F. Provide a concluding statement or section that follows from the information or explanation presented.</i></p> <p><b>W.6.4.</b> Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)</p> <p><b>W.6.7.</b> Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate. <b>W.6.8.</b> Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.</p>

**SL.6.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

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D. Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing.

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  - CRP11. Use technology to enhance productivity.
  - CRP12. Work productively in teams while using cultural global competence.
- [Link to GHS Career Standards 9.2 Crosswalk Doc](#)

#### 2014 Technology Standards

##### 2014 NJ Technology Standards:

- 8.1 Educational Technology** ([Word](#) | [PDF](#))  
All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
- 8.2 Technology Education, Engineering, Design and Computational Thinking - Programming** ([Word](#) | [PDF](#))  
All students will develop an understanding of the nature and impact of technology, engineering,

	<p>technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.</p> <p>Please see relevant projects for technology standards <a href="#">8.1</a> and <a href="#">8.2</a>:</p>
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**Differentiation / Accommodations / Modifications**

[See Appendix 3: Differentiation - Modifications - Accommodations](#)

<b>Pacing: 3 weeks</b>		<b>Unit 8: Geology- Earth Dynamics</b>	
<b>Standards and Suggested Activities</b>		<b>Skills and Knowledge</b>	
<p>MS-ESS2-1. Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process</p> <p>MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales</p> <p>MS-ESS2-3. Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● convection current demonstration</li> <li>● stresses and faults activity</li> <li>● Hot spot model activity</li> <li>● Weathering and erosion lab</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● model and identify the stresses and resultant faults associated with the interaction of forces at plate boundaries.</li> <li>● distinguish between the effects of subsidence and uplift.</li> <li>● identify the various landforms resulting from specific stresses and faults.</li> <li>● identify the effects of weathering and erosion on landforms.</li> <li>● describe the causes and effects of hot spots on Earth’s crust.</li> </ul>	<p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>

MS-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.		
<b>District/School Formative Assessment Plan</b>		<b>District/School Summative Assessment Plan</b>
<ul style="list-style-type: none"> <li>Class discussions in which student share prior knowledge</li> </ul>		<ul style="list-style-type: none"> <li>Teacher-created quizzes</li> <li>Teacher-created unit assessments</li> <li>Labs</li> </ul>
<b>Core Instructional Materials</b>		<b>District/School Supplementary Resources</b>
<ul style="list-style-type: none"> <li><i>Glencoe iScience Earth and Space Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>Discovery Education videos</li> <li>Glencoe ConnectEd online resources</li> </ul>

### Interdisciplinary Connections throughout the K-12 Curriculum

#### [Appendix: Reading & Writing Companion Standards for Science](#)

##### **Mathematics**

**MP.2** Reason abstractly and quantitatively. (MS-ESS2-2),(MS-ESS2-3)

**6.EE.B.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number; or, depending on the purpose at hand, any number in a specified set. (MS-ESS2-2),(MS-ESS2-3)

**7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. (MS-ESS2-2),(MS-ESS2-3)

##### **English-Language Arts:**

**RI.6.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.

**W.6.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia) when useful to aiding comprehension.

B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.

C. Use appropriate transitions to clarify the relationships among ideas and concepts.

D. Use precise language and domain-specific vocabulary to inform about or explain the topic.

E. Establish and maintain a formal/academic style, approach, and form.

F. Provide a concluding statement or section that follows from the information or explanation presented.

**W.6.4.** Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

**W.6.7.** Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate. **W.6.8.** Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.

**SL.6.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others’ ideas and expressing their own clearly.

**A.** Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

**B.** Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.

**C.** Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.

**D.** Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing. **SL.6.2.** Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

**SL.6.3.** Deconstruct a speaker’s argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.

**SL.6.4.** Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate speaking behaviors (e.g., eye contact, adequate volume, and clear pronunciation).

**SL.6.5.** Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

**SL.6.6.** Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

**Integration of 21st Century Themes and Skills**

**21st Century Skills/ Career Ready Practices:**

- CRP1. Act as a responsible and contributing citizen and employee.**
  - CRP2. Apply appropriate academic and technical skills.**
  - CRP3. Attend to personal health and financial well-being.**
  - CRP4. Communicate clearly and effectively and with reason.**
  - CRP5. Consider the environmental, social and economic impacts of decisions.**
  - CRP6. Demonstrate creativity and innovation.**
  - CRP7. Employ valid and reliable research strategies.**
  - CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**
  - CRP9. Model integrity, ethical leadership and effective management.**
  - CRP10. Plan education and career paths aligned to personal goals.**
  - CRP11. Use technology to enhance productivity.**
  - CRP12. Work productively in teams while using cultural global competence.**
- [Link to GHS Career Standards 9.2Crosswalk Doc](#)

**2014 Technology Standards**

**2014 NJ Technology Standards:**

**8.1 Educational Technology ([Word](#) | [PDF](#))**

	<p>All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.</p> <p><b>8.2 Technology Education, Engineering, Design and Computational Thinking - Programming</b>  <a href="#">(Word   PDF)</a></p> <p>All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.</p>
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**Differentiation / Accommodations / Modifications**

[See Appendix 3: Differentiation - Modifications - Accommodations](#)

<b>Pacing: 4 weeks</b>		<b>Unit 9: Earthquakes and Volcanoes</b>
<b>Standards and Suggested Activities</b>		<b>Skills and Knowledge</b>
<p>MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes.</p> <p>MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects</p> <p>MS-ESS3-3. Apply scientific principles to</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● seismic wave Slinky demos</li> <li>● Triangulation lab</li> <li>● Richter scale activity</li> <li>● Earthquake-resistant building lab</li> <li>● volcano eruption demos</li> <li>● parts of a volcano</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● identify and describe the types of seismic waves associated with earthquakes.</li> <li>● differentiate between the focus and epicenter of an earthquake.</li> <li>● identify where earthquakes and volcanoes are most likely to occur (Ring of Fire)</li> <li>● identify and describe the function of instruments used to measure earthquakes.</li> <li>● demonstrate the process of triangulation to locate the epicenter of an earthquake.</li> <li>● use the Richter scale to compare the energy magnitude of various earthquakes.</li> <li>● discuss how earthquakes impact human activity..</li> </ul>

<p>design a method for monitoring and minimizing a human impact on the environment.</p> <p>MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.</p> <p>MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.</p> <p>MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.</p> <p>MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.</p>	<p>activity</p>	<ul style="list-style-type: none"> <li>● describe construction techniques used to minimize earthquake damage.</li> <li>● design, test, and modify an earthquake-resistant building that meets predetermined criteria.</li> <li>● identify and describe the three main types of volcanoes.</li> <li>● describe the parts of a volcano.</li> <li>● describe how the energy and composition of matter affect the type of volcanic eruption.</li> <li>● identify the role of volcanoes in the rock cycle.</li> <li>● explain the geological and human impact from a volcanic eruption.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>
<p><b>District/School Formative Assessment Plan</b></p>	<p><b>District/School Summative Assessment Plan</b></p>	
<ul style="list-style-type: none"> <li>● Class discussions in which student share prior knowledge</li> </ul>	<ul style="list-style-type: none"> <li>● Teacher-created quizzes</li> </ul>	

<ul style="list-style-type: none"> <li>• Study Island</li> <li>• Quizzes</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher-created unit assessments</li> <li>• Labs</li> </ul>
<b>Core Instructional Materials</b>	<b>District/School Supplementary Resources</b>
<ul style="list-style-type: none"> <li>• <i>Glencoe iScience Earth and Space Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>	<ul style="list-style-type: none"> <li>• Discovery Education videos</li> <li>• Glencoe ConnectEd online resources</li> </ul>

### Interdisciplinary Connections throughout the K-12 Curriculum

#### [Appendix: Reading & Writing Companion Standards for Science](#)

##### **Mathematics**

**MP.2** Reason abstractly and quantitatively. (MS-ESS3-2)(MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3),(MS-ETS1-4)

**6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-ESS3-3)

**7.RP.A.2** Recognize and represent proportional relationships between quantities. (MS-ESS3-3)

**6.EE.B.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-ESS3-1),(MS-ESS3-2),(MS-ESS3-3)

**7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. (MS-ESS3-1),(MS-ESS3-2),(MS-ESS3-3)

**7.EE.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3)

**7.SP** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. (MS-ETS1-4)

##### **English-Language Arts:**

**RI.6.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.

**W.6.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia) when useful to aiding comprehension.

B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.

C. Use appropriate transitions to clarify the relationships among ideas and concepts.

D. Use precise language and domain-specific vocabulary to inform about or explain the topic.

E. Establish and maintain a formal/academic style, approach, and form.

F. Provide a concluding statement or section that follows from the information or explanation presented.

**W.6.4.** Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

**W.6.7.** Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate. **W.6.8.** Gather relevant

information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.

**SL.6.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

A. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

B. Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.

C. Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.

D. Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing. **SL.6.2.** Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

**SL.6.3.** Deconstruct a speaker's argument and specific claims, distinguishing claims that are supported by reasons and evidence from claims that are not.

**SL.6.4.** Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate speaking behaviors (e.g., eye contact, adequate volume, and clear pronunciation).

**SL.6.5.** Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

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#### Integration of 21st Century Themes and Skills

##### 21st Century Skills/ Career Ready Practices:

- CRP1. Act as a responsible and contributing citizen and employee.**
- CRP2. Apply appropriate academic and technical skills.**
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- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**
- CRP9. Model integrity, ethical leadership and effective management.**
- CRP10. Plan education and career paths aligned to personal goals.**
- CRP11. Use technology to enhance productivity.**
- CRP12. Work productively in teams while using cultural global competence.**

[Link to GHS Career Standards 9.2 Crosswalk Doc](#)

#### 2014 Technology Standards

##### 2014 NJ Technology Standards:

##### **8.1 Educational Technology** ([Word](#) | [PDF](#))

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

##### **8.2 Technology Education, Engineering, Design and Computational Thinking - Programming** ([Word](#) | [PDF](#))

All students will develop an understanding of the nature and impact of technology, engineering,

technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Please see relevant projects for technology standards [8.1](#) and [8.2](#):

**Differentiation / Accommodations / Modifications**

[See Appendix 3: Differentiation - Modifications - Accommodations](#)

## 7th Grade

Pacing: 4 weeks		Unit 1: Classifying and Exploring Life	
Standards and Suggested Activities		Skills and Knowledge	
<p>MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.</p> <p>MS-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.</p> <p>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.</p> <p>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</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● Intro to Microscope lab</li> <li>● Pond water lab</li> <li>● “Living Candle” demo</li> <li>● Lab safety demo and activity</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● identify the steps of the scientific method.</li> <li>● use the scientific method to design an investigation for possible solutions to a problem.</li> <li>● properly use a compound microscope.</li> <li>● distinguish between a scientific theory and a law.</li> <li>● identify and describe the characteristics of living things.</li> <li>● compare and contrast the theories of Spontaneous Generation and Biogenesis.</li> <li>● describe how living things are classified and use classification models.</li> <li>● explain the purpose and use of binomial nomenclature.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	

evolutionary relationships.  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		
<b>District/School Formative Assessment Plan</b>		<b>District/School Summative Assessment Plan</b>
<ul style="list-style-type: none"> <li>• Class discussions in which student share prior knowledge</li> <li>• Study Island assessments</li> <li>• Quizzes</li> </ul>		<ul style="list-style-type: none"> <li>• Teacher-created quizzes</li> <li>• Teacher-created unit assessments</li> <li>• Labs</li> </ul>
<b>Core Instructional Materials</b>		<b>District/School Supplementary Resources</b>
<ul style="list-style-type: none"> <li>• <i>Glencoe iScience Life Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>• Discovery Education videos</li> <li>• Glencoe ConnectEd online resources</li> <li>• <a href="#">Leveled texts/articles: Newsela</a></li> </ul>

<b>Interdisciplinary Connections throughout the K-12 Curriculum</b>	
<p><a href="#">See Appendix 1: Reading &amp; Writing Companion Standards for Science</a></p> <p><b><u>Mathematics</u></b>  <b>6.EE.C.9</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1),(MS-LS1-2),(MS-LS1-3),(MS-LS1-6)  <b>6.SP.A.2</b> Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. (MS-LS1-4)  <b>6.EE.B.6</b> Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-LS4-1),(MS-LS4-2)</p> <p><b><u>English-Language Arts:</u></b>  <b>RI.7.4.</b> Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a</p>	

*specific word choice on meaning and tone.*

**RI.7.8.** Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.

**W.7.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

*A. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).*

*B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.*

*C. Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts.*

*D. Use precise language and domain-specific vocabulary to inform about or explain the topic.*

*E. Establish and maintain a formal style academic style, approach, and form.*

*F. Provide a concluding statement or section that follows from and supports the information or explanation presented.*

**SL.7.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

*A. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.*

*B. Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.*

*C. Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.*

*D. Acknowledge new information expressed by others and, when warranted, modify their own views.*

**SL.7.2.** Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.

**SL.7.3.** Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.

**SL.7.4.** Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

**SL.7.5.** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

**SL.7.6.** Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

#### Integration of 21st Century Themes and Skills

##### 21st Century Skills/ Career Ready Practices:

**CRP1. Act as a responsible and contributing citizen and employee.**

**CRP2. Apply appropriate academic and technical skills.**

**CRP3. Attend to personal health and financial well-being.**

**CRP4. Communicate clearly and effectively and with reason.**

**CRP5. Consider the environmental, social and economic impacts of decisions.**

**CRP6. Demonstrate creativity and innovation.**

**CRP7. Employ valid and reliable research strategies.**

	<p>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.  CRP9. Model integrity, ethical leadership and effective management.  CRP10. Plan education and career paths aligned to personal goals.  CRP11. Use technology to enhance productivity.  CRP12. Work productively in teams while using cultural global competence.  <a href="#">Link to GHS Career Standards 9.2Crosswalk Doc</a></p>
<b>2014 Technology Standards</b>	
<p><a href="#">2014 NJ Technology Standards:</a></p>	<p><b>8.1 Educational Technology</b> (<a href="#">Word</a>   <a href="#">PDF</a>)  All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.</p> <p><b>8.2 Technology Education, Engineering, Design and Computational Thinking - Programming</b> (<a href="#">Word</a>   <a href="#">PDF</a>)  All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.</p> <p>Please see relevant projects for technology standards <a href="#">8.1</a> and <a href="#">8.2</a>:</p>
<b>Differentiation / Accommodations / Modifications</b>	
<p><a href="#">See Appendix 3: Modifications</a></p>	

Pacing: 4 weeks		Unit 2: Cells: Structure and Function	
Standards and Suggested Activities		Skills and Knowledge	
<p>MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.</p> <p>MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.</p> <p>MS-LS1-7. Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism</p>	<ul style="list-style-type: none"> <li>• Kinesthetic activities</li> <li>• Classroom demonstrations</li> <li>• Cheek cell and plant cell lab</li> <li>• Cell model activity</li> <li>• Diffusion activity</li> <li>• active vs. passive transport activity</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• explain the tenets of cell theory</li> <li>• identify and describe the function of the macromolecules that make up cells.</li> <li>• distinguish between eukaryotic and prokaryotic cells.</li> <li>• explain differences between bacteria, plant, and animal cells.</li> <li>• diagram and describe the parts of a typical cell</li> <li>• describe the function of each type of organelle within a eukaryotic cell.</li> <li>• explain how material is processed, transported, and stored within a cell.</li> <li>• describe how a cell stores and releases energy to carry out cell functions.</li> <li>• detail the methods by which material moves across a cell membrane.</li> <li>• describe the reverse energy processes of cellular respiration and photosynthesis.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	
District/School Formative Assessment Plan		District/School Summative Assessment Plan	
<ul style="list-style-type: none"> <li>• Class discussions in which student share prior knowledge</li> <li>• Study Island assessments</li> <li>• Quizzes</li> </ul>		<ul style="list-style-type: none"> <li>• Teacher-created quizzes</li> <li>• Teacher-created unit assessments</li> <li>• Labs</li> </ul>	
Core Instructional Materials		District/School Supplementary Resources	
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## Interdisciplinary Connections throughout the K-12 Curriculum

### [See Appendix 1: Reading & Writing Companion Standards for Science](#)

#### **Mathematics**

**6.EE.C.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1),(MS-LS1-2)

#### **English-Language Arts:**

**RI.7.4.** *Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.*

**RI.7.8.** *Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.*

**W.7.2.** *Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.*

*A. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).*

*B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.*

*C. Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts.*

*D. Use precise language and domain-specific vocabulary to inform about or explain the topic.*

*E. Establish and maintain a formal style academic style, approach, and form.*

*F. Provide a concluding statement or section that follows from and supports the information or explanation presented.*

**SL.7.1.** *Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.*

*A. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.*

*B. Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.*

*C. Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.*

*D. Acknowledge new information expressed by others and, when warranted, modify their own views.*

**SL.7.2.** *Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.*

**SL.7.3.** *Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.*

**SL.7.4.** *Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.*

**SL.7.5.** *Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.*

**SL.7.6.** *Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.*

<b>Integration of 21st Century Themes and Skills</b>	
<u><a href="#">21st Century Skills/ Career Ready Practices:</a></u>	<p><b>CRP1. Act as a responsible and contributing citizen and employee.</b>  <b>CRP2. Apply appropriate academic and technical skills.</b>  <b>CRP3. Attend to personal health and financial well-being.</b>  <b>CRP4. Communicate clearly and effectively and with reason.</b>  <b>CRP5. Consider the environmental, social and economic impacts of decisions.</b>  <b>CRP6. Demonstrate creativity and innovation.</b>  <b>CRP7. Employ valid and reliable research strategies.</b>  <b>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</b>  <b>CRP9. Model integrity, ethical leadership and effective management.</b>  <b>CRP10. Plan education and career paths aligned to personal goals.</b>  <b>CRP11. Use technology to enhance productivity.</b>  <b>CRP12. Work productively in teams while using cultural global competence.</b></p> <p><u><a href="#">Link to GHS Career Standards 9.2Crosswalk Doc</a></u></p>
<b>2014 Technology Standards</b>	
<u><a href="#">2014 NJ Technology Standards:</a></u>	<p><b>8.1 Educational Technology</b> (<u><a href="#">Word</a></u>   <u><a href="#">PDF</a></u>)  All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.</p> <p><b>8.2 Technology Education, Engineering, Design and Computational Thinking - Programming</b> (<u><a href="#">Word</a></u>   <u><a href="#">PDF</a></u>)  All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.</p> <p>Please see relevant projects for technology standards <u><a href="#">8.1</a></u> and <u><a href="#">8.2</a></u>:</p>

<b>Differentiation / Accommodations / Modifications</b>
<a href="#">See Appendix 3: Modifications</a>

Pacing: 3 weeks		Unit 3: From a Cell to an Organism	
Standards and Suggested Activities		Skills and Knowledge	
<p>MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.</p> <p>MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.</p> <p>MS-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells</p> <p>MS-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● steps of mitosis activity</li> <li>● mitosis group activity</li> <li>● nervous system -stimulus/ response memory storage lab</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● describe the cycle of growth, development, and division of a cell.</li> <li>● identify and describe the steps of the mitotic phase of the cell cycle.</li> <li>● explain the importance of cell division to an organism’s survival.</li> <li>● identify the purpose of stem cells in the process of cell differentiation.</li> <li>● describe current stem cell research and use in medicine.</li> <li>● detail the organization of an organism from individual cells through body systems.</li> <li>● identify how the nervous system uses the five senses to enable stimulus and response and generate memories.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	
District/School Formative Assessment Plan		District/School Summative Assessment Plan	
<ul style="list-style-type: none"> <li>● Class discussions in which student share prior knowledge</li> <li>● Study Island assessments</li> <li>● Quizzes</li> </ul>		<ul style="list-style-type: none"> <li>● Teacher-created quizzes</li> <li>● Teacher-created unit assessments</li> <li>● Labs</li> </ul>	
Core Instructional Materials		District/School Supplementary Resources	
<ul style="list-style-type: none"> <li>● <i>Glencoe iScience Life Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>● Discovery Education videos</li> <li>● Glencoe ConnectEd online resources</li> <li>● <a href="#">Leveled texts/articles: Newsela</a></li> </ul>	

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Interdisciplinary Connections throughout the K-12 Curriculum	
<a href="#">See Appendix 1: Reading &amp; Writing Companion Standards for Science</a>	
<b><u>Mathematics</u></b>	
<b>6.EE.C.9</b> Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1),(MS-LS1-2)	
<b><u>English-Language Arts:</u></b>	
<b>RI.7.4.</b> Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.	
<b>RI.7.8.</b> Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.	
<b>W.7.2.</b> Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.	
A. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).	
B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.	
C. Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts.	
D. Use precise language and domain-specific vocabulary to inform about or explain the topic.	
E. Establish and maintain a formal style academic style, approach, and form.	
F. Provide a concluding statement or section that follows from and supports the information or explanation presented.	
<b>SL.7.1.</b> Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.	
A. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.	
B. Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.	
C. Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.	
D. Acknowledge new information expressed by others and, when warranted, modify their own views.	
<b>SL.7.2.</b> Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.	
<b>SL.7.3.</b> Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.	

*SL.7.4. Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.*

*SL.7.5. Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.*

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#### Integration of 21st Century Themes and Skills

##### 21st Century Skills/ Career Ready Practices:

- CRP1. Act as a responsible and contributing citizen and employee.
  - CRP2. Apply appropriate academic and technical skills.
  - CRP3. Attend to personal health and financial well-being.
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  - CRP6. Demonstrate creativity and innovation.
  - CRP7. Employ valid and reliable research strategies.
  - CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
  - CRP9. Model integrity, ethical leadership and effective management.
  - CRP10. Plan education and career paths aligned to personal goals.
  - CRP11. Use technology to enhance productivity.
  - CRP12. Work productively in teams while using cultural global competence.
- [Link to GHS Career Standards 9.2 Crosswalk Doc](#)

#### 2014 Technology Standards

##### 2014 NJ Technology Standards:

##### **8.1 Educational Technology** ([Word](#) | [PDF](#))

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

##### **8.2 Technology Education, Engineering, Design and Computational Thinking - Programming**

([Word](#) | [PDF](#))

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Please see relevant projects for technology standards [8.1](#) and [8.2](#):

#### Differentiation / Accommodations / Modifications

[See Appendix 3: Modifications](#)

Pacing: 4 weeks		Unit 4: Reproduction of Organisms and Genetics
Standards and Suggested Activities		Skills and Knowledge
<p>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.</p> <p>MS-LS3-2. Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.</p> <p>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</p> <p>MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.</p> <p>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.</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● Mendel Pea-pod lab</li> <li>● Meiosis group activity</li> <li>● Critter lab</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● distinguish between sexual and asexual reproduction.</li> <li>● describe how haploid sex cells are formed.</li> <li>● identify and describe the steps of meiosis in the formation of sex cells.</li> <li>● explain the significance of sexual reproduction in the survival of a species.</li> <li>● describe the significance of Gregor Mendel's research regarding heredity and genetics.</li> <li>● explain how two or more alleles combine to determine the appearance of traits.</li> <li>● describe how environmental factors can affect the inheritance of traits.</li> <li>● use a Punnett Square to make predictions about simple inheritance of traits.</li> <li>● distinguish between chromosomes, genes, and alleles.</li> <li>● describe how DNA replicates.</li> <li>● detail how genes can mutate and their effect on organisms.</li> <li>● describe developments in the field of genetic engineering</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>

MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.		
<b>District/School Formative Assessment Plan</b>		<b>District/School Summative Assessment Plan</b>
<ul style="list-style-type: none"> <li>• Class discussions in which student share prior knowledge</li> <li>• Study Island assessments</li> <li>• Quizzes</li> </ul>		<ul style="list-style-type: none"> <li>• Teacher-created quizzes</li> <li>• Teacher-created unit assessments</li> <li>• Labs</li> </ul>
<b>Core Instructional Materials</b>		<b>District/School Supplementary Resources</b>
<ul style="list-style-type: none"> <li>• <i>Glencoe iScience Life Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>• Discovery Education videos</li> <li>• Glencoe ConnectEd online resources</li> <li>• <a href="#">Leveled texts/articles: Newsela</a></li> </ul>

<b>Interdisciplinary Connections throughout the K-12 Curriculum</b>
<p><a href="#">See Appendix 1: Reading &amp; Writing Companion Standards for Science</a></p> <p><b><u>Mathematics</u></b> –</p> <p><i>MP.4 Model with mathematics. (MS-LS3-2) (MS-LS4-6)</i></p> <p><i>6.SP.B.5 Summarize numerical data sets in relation to their context. (MS-LS3-2) (MS-LS4-4),(MS-LS4-6)(MS-LS1-5)</i></p> <p><i>6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-LS4-4),(MS-LS4-6)</i></p> <p><i>7.RP.A.2 Recognize and represent proportional relationships between quantities. (MS-LS4-4),(MS-LS4-6)</i></p> <p><i>6.SPA.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. (MS-LS1-5)</i></p> <p><b><u>English-Language Arts:</u></b></p> <p><i>RI.7.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.</i></p> <p><i>RI.7.8. Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.</i></p> <p><i>W.7.2. Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</i></p> <p><i>A. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using text structures (e.g., definition, classification,</i></p>

comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).

B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.

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#### Integration of 21st Century Themes and Skills

##### 21st Century Skills/ Career Ready Practices:

**CRP1.** Act as a responsible and contributing citizen and employee.

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**CRP3.** Attend to personal health and financial well-being.

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**CRP12.** Work productively in teams while using cultural global competence.

[Link to GHS Career Standards 9.2 Crosswalk Doc](#)

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<p><a href="#">2014 NJ Technology Standards:</a></p>	<p><b>8.1 Educational Technology</b> (<a href="#">Word</a>   <a href="#">PDF</a>)  All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.</p> <p><b>8.2 Technology Education, Engineering, Design and Computational Thinking - Programming</b> (<a href="#">Word</a>   <a href="#">PDF</a>)  All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.</p> <p>Please see relevant projects for technology standards <a href="#">8.1</a> and <a href="#">8.2</a>:</p>
<b>Differentiation / Accommodations / Modifications</b>	
<p><a href="#">See Appendix 3: Modifications</a></p>	

Pacing: 5 weeks		Unit 5: Animal Diversity	
Standards and Suggested Activities		Skills and Knowledge	
<p>MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.</p> <p>MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.</p> <p>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</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● protist lab</li> <li>● cladogram activity</li> <li>● Hydra lab</li> <li>● planaria lab</li> <li>● earthworm dissection</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● describe how organisms are classified based on Linnaean taxonomy.</li> <li>● use a cladogram to describe evolutionary relationships among organisms.</li> <li>● identify various methods of asexual reproduction.</li> <li>● name and describe the characteristics of animal-like protists.</li> <li>● explain the characteristics of Kingdom Animalia.</li> <li>● identify and describe differences among the various animal phyla.</li> <li>● describe the different classes of chordates.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	
District/School Formative Assessment Plan		District/School Summative Assessment Plan	
<ul style="list-style-type: none"> <li>● Class discussions in which student share prior knowledge</li> <li>● Study Island assessments</li> <li>● Quizzes</li> </ul>		<ul style="list-style-type: none"> <li>● Teacher-created quizzes</li> <li>● Teacher-created unit assessments</li> <li>● Labs</li> </ul>	
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## Interdisciplinary Connections throughout the K-12 Curriculum

### [See Appendix 1: Reading & Writing Companion Standards for Science](#)

#### ***Mathematics –***

**6.EE.C.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1)

**6.SP.A.2** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. (MS-LS1-4)

**6.SP.B.4** Summarize numerical data sets in relation to their context. (MS-LS1-4)

**6.EE.B.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-LS4-2)

#### ***English-Language Arts:***

**RI.7.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.

**RI.7.8.** Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.

**W.7.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

A. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).

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*SL.7.3. Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.*

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### Integration of 21st Century Themes and Skills

#### 21st Century Skills/ Career Ready Practices:

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**CRP9. Model integrity, ethical leadership and effective management.**

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[Link to GHS Career Standards 9.2Crosswalk Doc](#)

### 2014 Technology Standards

#### 2014 NJ Technology Standards:

**8.1 Educational Technology** ([Word](#) | [PDF](#))

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

**8.2 Technology Education, Engineering, Design and Computational Thinking - Programming** ([Word](#) | [PDF](#))

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Please see relevant projects for technology standards [8.1](#) and [8.2](#):

**Differentiation / Accommodations / Modifications**

[See Appendix 3: Modifications](#)

Pacing: 5 weeks		Unit 6: Animal Structure and Function	
Standards and Suggested Activities		Skills and Knowledge	
<p>MS-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.</p> <p>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</p>	<ul style="list-style-type: none"> <li>• Kinesthetic activities</li> <li>• Classroom demonstrations</li> <li>• Squid virtual dissection lab</li> <li>• Fish dissection lab</li> <li>• Frog dissection lab</li> <li>• reproduction chart activity</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• describe the various methods of support, control, and movement used by animals.</li> <li>• distinguish between open and closed circulatory systems.</li> <li>• identify and describe the function of the three types of hearts.</li> <li>• identify and describe the various methods used by different classes of animals for gas exchange.</li> <li>• differentiate between digestion and absorption of nutrients.</li> <li>• identify and describe the purpose of structures for digestion of various classes of animals.</li> <li>• explain the various processes for waste removal from an organism.</li> <li>• describe the interdependence of the circulatory and respiratory systems.</li> <li>• describe the structure and function of the amniotic egg</li> <li>• trace the ramifications of the increasing embryological complexity across classes of vertebrates.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	
District/School Formative Assessment Plan		District/School Summative Assessment Plan	
<ul style="list-style-type: none"> <li>• Class discussions in which student share prior knowledge</li> <li>• Study Island assessments</li> <li>• Quizzes</li> </ul>		<ul style="list-style-type: none"> <li>• Teacher-created quizzes</li> <li>• Teacher-created unit assessments</li> <li>• Labs</li> </ul>	
Core Instructional Materials		District/School Supplementary Resources	
<ul style="list-style-type: none"> <li>• <i>Glencoe iScience Life Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>• Discovery Education videos</li> <li>• Glencoe ConnectEd online resources</li> <li>• <a href="#">Leveled texts/articles: Newsela</a></li> </ul>	

**Interdisciplinary Connections throughout the K-12 Curriculum**

[See Appendix 1: Reading & Writing Companion Standards for Science](#)

**English-Language Arts:**

**RI.7.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.

**RI.7.8.** Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.

**W.7.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

*A. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).*

*B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.*

*C. Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts.*

*D. Use precise language and domain-specific vocabulary to inform about or explain the topic.*

*E. Establish and maintain a formal style academic style, approach, and form.*

*F. Provide a concluding statement or section that follows from and supports the information or explanation presented.*

**SL.7.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

*A. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.*

*B. Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.*

*C. Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.*

*D. Acknowledge new information expressed by others and, when warranted, modify their own views.*

**SL.7.2.** Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.

**SL.7.3.** Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.

**SL.7.4.** Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

**SL.7.5.** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

**SL.7.6.** Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

**Integration of 21st Century Themes and Skills**

**21st Century Skills/ Career Ready Practices:**

**CRP1. Act as a responsible and contributing citizen and employee.**

**CRP2. Apply appropriate academic and technical skills.**

**CRP3. Attend to personal health and financial well-being.**

	<p>CRP4. Communicate clearly and effectively and with reason.  CRP5. Consider the environmental, social and economic impacts of decisions.  CRP6. Demonstrate creativity and innovation.  CRP7. Employ valid and reliable research strategies.  CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.  CRP9. Model integrity, ethical leadership and effective management.  CRP10. Plan education and career paths aligned to personal goals.  CRP11. Use technology to enhance productivity.  CRP12. Work productively in teams while using cultural global competence.  <a href="#">Link to GHS Career Standards 9.2Crosswalk Doc</a></p>
<b>2014 Technology Standards</b>	
<p><a href="#">2014 NJ Technology Standards:</a></p>	<p><b>8.1 Educational Technology</b> (<a href="#">Word</a>   <a href="#">PDF</a>)  All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.</p> <p><b>8.2 Technology Education, Engineering, Design and Computational Thinking - Programming</b> (<a href="#">Word</a>   <a href="#">PDF</a>)  All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.</p> <p>Please see relevant projects for technology standards <a href="#">8.1</a> and <a href="#">8.2</a>:</p>
<b>Differentiation / Accommodations / Modifications</b>	
<p><a href="#">See Appendix 3: Modifications</a></p>	

<b>Pacing: 3 weeks</b>		<b>Unit 7: Bacteria and Viruses</b>	
<b>Standards and Suggested Activities</b>		<b>Skills and Knowledge</b>	
<p>MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.</p> <p>MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.</p> <p>MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.</p> <p>MS-LS3-2. Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.</p> <p>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.</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● Bacteria culture lab</li> <li>● Controlling bacteria lab</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● identify the characteristics of bacteria explain how it is classified</li> <li>● explain positive and negative environmental impacts of bacteria</li> <li>● describe beneficial applications of bacteria in industry</li> <li>● describe the development and use of antibiotics</li> <li>● identify the characteristics and structure of viruses.</li> <li>● explain how viruses replicate.</li> <li>● describe how an organism's immune system forms antibodies to protect that organism from future harm from the virus.</li> <li>● name medical advances in the treatment of viruses.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	
<b>District/School Formative Assessment Plan</b>		<b>District/School Summative Assessment Plan</b>	
<ul style="list-style-type: none"> <li>● Class discussions in which student share prior knowledge</li> <li>● Study Island assessments</li> <li>● Quizzes</li> </ul>		<ul style="list-style-type: none"> <li>● Teacher-created quizzes</li> <li>● Teacher-created unit assessments</li> <li>● Labs</li> </ul>	
<b>Core Instructional Materials</b>		<b>District/School Supplementary Resources</b>	
<ul style="list-style-type: none"> <li>● <i>Glencoe iScience Life Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>● Discovery Education videos</li> <li>● Glencoe ConnectEd online resources</li> </ul>	

- [Leveled texts/articles: Newsela](#)

### Interdisciplinary Connections throughout the K-12 Curriculum

#### [See Appendix 1: Reading & Writing Companion Standards for Science](#)

##### **Mathematics**

**MP.4** Model with mathematics. (MS-LS3-2)

**6.SP.B.5** Summarize numerical data sets in relation to their context. (MS-LS3-2) (MS-LS4-4)

**6.EE.C.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1),(MS-LS1-2)

**6.SP.A.2** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. (MS-LS1-5)

**6.SP.B.4** Summarize numerical data sets in relation to their context. (MS-LS1-5)

**7.RP.A.2** Recognize and represent proportional relationships between quantities. (MS-LS4-4)

##### **English-Language Arts:**

**RI.7.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.

**RI.7.8.** Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.

**W.7.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

A. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).

B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.

C. Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts.

D. Use precise language and domain-specific vocabulary to inform about or explain the topic.

E. Establish and maintain a formal style academic style, approach, and form.

F. Provide a concluding statement or section that follows from and supports the information or explanation presented.

**SL.7.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

A. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

B. Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.

C. Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.

D. Acknowledge new information expressed by others and, when warranted, modify their own views.

- SL.7.2. Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.*
- SL.7.3. Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.*
- SL.7.4. Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.*
- SL.7.5. Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.*
- SL.7.6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.*

**Integration of 21st Century Themes and Skills**

**21st Century Skills/ Career Ready Practices:**

- CRP1. Act as a responsible and contributing citizen and employee.**
  - CRP2. Apply appropriate academic and technical skills.**
  - CRP3. Attend to personal health and financial well-being.**
  - CRP4. Communicate clearly and effectively and with reason.**
  - CRP5. Consider the environmental, social and economic impacts of decisions.**
  - CRP6. Demonstrate creativity and innovation.**
  - CRP7. Employ valid and reliable research strategies.**
  - CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**
  - CRP9. Model integrity, ethical leadership and effective management.**
  - CRP10. Plan education and career paths aligned to personal goals.**
  - CRP11. Use technology to enhance productivity.**
  - CRP12. Work productively in teams while using cultural global competence.**
- [Link to GHS Career Standards 9.2Crosswalk Doc](#)

**2014 Technology Standards**

**2014 NJ Technology Standards:**

- 8.1 Educational Technology ([Word](#) | [PDF](#))**  
All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
  - 8.2 Technology Education, Engineering, Design and Computational Thinking - Programming ([Word](#) | [PDF](#))**  
All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
- Please see relevant projects for technology standards [8.1](#) and [8.2](#):

<b>Differentiation / Accommodations / Modifications</b>	
<a href="#">See Appendix 3: Modifications</a>	

Pacing: 2 weeks		<b>Unit 8: Protists and Fungi</b>	
<b>Standards and Suggested Activities</b>		<b>Skills and Knowledge</b>	
<p>MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.</p> <p>MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.</p> <p>MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.</p> <p>MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.</p> <p>MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.</p> <p>MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.</p> <p>MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations</p> <p>MS-LS3-2. Develop and use a model to describe why asexual reproduction results in offspring with identical genetic</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● protist lab</li> <li>● Fungi and lichen lab</li> <li>● Environmental pest control project</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● identify the characteristics and types of protists and explain how they are classified.</li> <li>● detail the positive and negative environmental impacts of various types of protists.</li> <li>● describe the effect of protists on human life.</li> <li>● identify the characteristics and types of fungi and explain how they are classified.</li> <li>● explain the impact fungi have on the environment.</li> <li>● discuss Alexander Fleming’s discovery of penicillin and its importance as an antibiotic. .</li> <li>● describe the importance of fungi to health and medicine.</li> <li>● demonstrate an understanding of the symbiotic relationship in lichen and its environmental importance.</li> <li>● conduct an investigation to mitigate the negative impact of a pest to humans..</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	

<p>information and sexual reproduction results in offspring with genetic variation.</p> <p>MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.</p> <p>MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.</p> <p>MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.</p> <p>MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.</p>		
<p><b>District/School Formative Assessment Plan</b></p>	<p><b>District/School Summative Assessment Plan</b></p>	
<ul style="list-style-type: none"> <li>● Class discussions in which student share prior knowledge</li> <li>● Study Island assessments</li> <li>● Quizzes</li> </ul>	<ul style="list-style-type: none"> <li>● Teacher-created quizzes</li> <li>● Teacher-created unit assessments</li> <li>● Labs</li> </ul>	
<p><b>Core Instructional Materials</b></p>	<p><b>District/School Supplementary Resources</b></p>	
<ul style="list-style-type: none"> <li>● <i>Glencoe iScience Life Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>	<ul style="list-style-type: none"> <li>● Discovery Education videos</li> <li>● Glencoe ConnectEd online resources</li> <li>● <a href="#">Leveled texts/articles: Newsela</a></li> </ul>	

**Interdisciplinary Connections throughout the K-12 Curriculum**

[See Appendix 1: Reading & Writing Companion Standards for Science](#)

**Mathematics**

**MP.2** Reason abstractly and quantitatively. (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3),(MS-ETS1-4)

**MP.4** Model with mathematics. (MS-LS3-2)

**6.EE.C.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1),(MS-LS1-2),(MS-LS1-6)

**6.SP.A.2** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. (MS-LS1-4),(MS-LS1-5)

**6.SP.B.4** Summarize numerical data sets in relation to their context. (MS-LS1-4),(MS-LS1-5)(MS-LS3-2)

**7.EE.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3)

**7.SP** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. (MS-ETS1-4)

**English-Language Arts:**

**RI.7.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.

**RI.7.8.** Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.

**W.7.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

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B. Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.

C. Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.

D. Acknowledge new information expressed by others and, when warranted, modify their own views.

**SL.7.2.** Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a

topic, text, or issue under study.

**SL.7.3.** Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.

**SL.7.4.** Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

**SL.7.5.** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

**SL.7.6.** Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

### Integration of 21st Century Themes and Skills

#### 21st Century Skills/ Career Ready Practices:

- CRP1. Act as a responsible and contributing citizen and employee.**
  - CRP2. Apply appropriate academic and technical skills.**
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  - CRP9. Model integrity, ethical leadership and effective management.**
  - CRP10. Plan education and career paths aligned to personal goals.**
  - CRP11. Use technology to enhance productivity.**
  - CRP12. Work productively in teams while using cultural global competence.**
- [Link to GHS Career Standards 9.2Crosswalk Doc](#)

### 2014 Technology Standards

#### 2014 NJ Technology Standards:

#### **8.1 Educational Technology** ([Word](#) | [PDF](#))

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

#### **8.2 Technology Education, Engineering, Design and Computational Thinking - Programming**

([Word](#) | [PDF](#))

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Please see relevant projects for technology standards [8.1](#) and [8.2](#):

<b>Differentiation / Accommodations / Modifications</b>	
<a href="#"><u>See Appendix 3: Modifications</u></a>	

Pacing: 3 weeks		<b>Unit 9: Plant Diversity</b>	
<b>Standards and Suggested Activities</b>		<b>Skills and Knowledge</b>	
<p>MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.</p> <p>MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.</p> <p>MS-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells</p> <p>MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.</p> <p>MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.</p> <p>MS-LS3-2. Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.</p> <p>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.</p> <p>MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li>   <li>● Classroom demonstrations</li>   <li>● plant classification lab</li>   <li>● stomata lab</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● diagram and identify the parts of a plant cell.</li> <li>● describe how plants are classified according to their structure.</li> <li>● detail how various types of plants reproduce.</li> <li>● explain and diagram how photosynthesis occurs in a typical leaf of a plant.</li> <li>● compare and contrast the use of technology in genetically modified plants.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	

desired traits in organisms.		
<b>District/School Formative Assessment Plan</b>		<b>District/School Summative Assessment Plan</b>
<ul style="list-style-type: none"> <li>• Class discussions in which student share prior knowledge</li> <li>• Study Island assessments</li> <li>• Quizzes</li> </ul>		<ul style="list-style-type: none"> <li>• Teacher-created quizzes</li> <li>• Teacher-created unit assessments</li> <li>• Labs</li> </ul>
<b>Core Instructional Materials</b>		<b>District/School Supplementary Resources</b>
<ul style="list-style-type: none"> <li>• <i>Glencoe iScience Life Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>• Discovery Education videos</li> <li>• Glencoe ConnectEd online resources</li> <li>• <a href="#">Leveled texts/articles: Newsela</a></li> </ul>

<b>Interdisciplinary Connections throughout the K-12 Curriculum</b>
<p><a href="#">See Appendix 1: Reading &amp; Writing Companion Standards for Science</a></p> <p><b><u>Mathematics</u></b></p> <p><i>MP.4 Model with mathematics. (MS-LS3-2)</i></p> <p><i>6.SP.B.5 Summarize numerical data sets in relation to their context. (MS-LS3-2)</i></p> <p><i>6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1),(MS-LS1-2),(MS-LS1-3),(MS-LS1-6)</i></p> <p><i>6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. (MS-LS1-4)</i></p> <p><i>6.SP.B.4 Summarize numerical data sets in relation to their context. (MS-LS1-4)(MS-LS4-4)</i></p> <p><i>6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-LS4-4)</i></p> <p><i>7.RP.A.2 Recognize and represent proportional relationships between quantities. (MS-LS4-4)</i></p> <p><b><u>English-Language Arts:</u></b></p> <p><i>RI.7.4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.</i></p> <p><i>RI.7.8. Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims.</i></p> <p><i>W.7.2. Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.</i></p> <p><i>A. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).</i></p>

- B. Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.
- C. Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts.
- D. Use precise language and domain-specific vocabulary to inform about or explain the topic.
- E. Establish and maintain a formal style academic style, approach, and form.
- F. Provide a concluding statement or section that follows from and supports the information or explanation presented.
- SL.7.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
- A. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.
- B. Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.
- C. Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.
- D. Acknowledge new information expressed by others and, when warranted, modify their own views.
- SL.7.2.** Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.
- SL.7.3.** Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and the relevance and sufficiency of the evidence.
- SL.7.4.** Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.
- SL.7.5.** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.
- SL.7.6.** Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

#### Integration of 21st Century Themes and Skills

#### 21st Century Skills/ Career Ready Practices:

- CRP1.** Act as a responsible and contributing citizen and employee.
- CRP2.** Apply appropriate academic and technical skills.
- CRP3.** Attend to personal health and financial well-being.
- CRP4.** Communicate clearly and effectively and with reason.
- CRP5.** Consider the environmental, social and economic impacts of decisions.
- CRP6.** Demonstrate creativity and innovation.
- CRP7.** Employ valid and reliable research strategies.
- CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP9.** Model integrity, ethical leadership and effective management.
- CRP10.** Plan education and career paths aligned to personal goals.
- CRP11.** Use technology to enhance productivity.
- CRP12.** Work productively in teams while using cultural global competence.

[Link to GHS Career Standards 9.2Crosswalk Doc](#)

[2014 NJ Technology Standards:](#)

**8.1 Educational Technology** ([Word](#) | [PDF](#))

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

**8.2 Technology Education, Engineering, Design and Computational Thinking - Programming** ([Word](#) | [PDF](#))

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Please see relevant projects for technology standards [8.1](#) and [8.2](#):

**Differentiation / Accommodations / Modifications**

[See Appendix 3: Modifications](#)

## 8th Grade

Pacing: 3 weeks		<b>Unit 1: Motion and Forces: Density and Motion</b>	
<b>Standards and Suggested Activities</b>		<b>Skills and Knowledge</b>	
<p>MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.</p> <p>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.</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● Velocity lab</li> <li>● Acceleration lab</li> <li>● Graphing activities</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● demonstrate the ability to accurately measure in metric linear, mass, and volume units following appropriate lab techniques.</li> <li>● measure and calculate the the density of various objects</li> <li>● compare the density of water to that of other materials.</li> <li>● differentiate between mass and weight.</li> <li>● describe an object’s motion in terms of speed, velocity, and displacement.</li> <li>● define acceleration in terms of the rate of change of velocity of an object.</li> <li>● construct and interpret velocity and acceleration graphs.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	
<b>District/School Formative Assessment Plan</b>		<b>District/School Summative Assessment Plan</b>	
<ul style="list-style-type: none"> <li>● Class discussions in which student share prior knowledge</li> <li>● Study Island</li> <li>● Quizzes</li> <li>● <a href="#">Gr. 8 NJSLA-Science Practice Tests</a></li> </ul>		<ul style="list-style-type: none"> <li>● Teacher-created quizzes</li> <li>● Teacher-created unit assessments</li> <li>● Labs</li> <li>● Gr. 8 NJSLA</li> </ul>	
<b>Core Instructional Materials</b>		<b>District/School Supplementary Resources</b>	
<ul style="list-style-type: none"> <li>● <i>Glencoe iScience Physical Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>● Discovery Education videos</li> <li>● Glencoe ConnectEd online resources</li> </ul>	

- [Leveled articles/text: Newsela](#)

## **Interdisciplinary Connections throughout the K-12 Curriculum**

### [See Appendix 1: Reading & Writing Companion Standards for Science](#)

#### **Mathematics**

**MP.2** Reason abstractly and quantitatively. (MS-PS1-1)

**MP.4** Model with mathematics. (MS-PS1-1)

**7.G.B.6** Solve real-world and mathematical problems involving area, volume and surface area of two and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

**6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems. (MS-PS1-1)

**8.EE.A.3** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. (MS-PS1-1)

#### **English-Language Arts:**

**RI.8.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

**RI.8.5.** Analyze the structure an author uses to organize a specific paragraph in a text, including the role of particular sentences, to develop and to refine a key concept.

**RI.8.6.** Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.

**RI.8.7.** Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.

**W.8.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).

B. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

C. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

D. Use precise language and domain-specific vocabulary to inform about or explain the topic.

E. Establish and maintain a formal style/academic style, approach, and form.

F. Provide a concluding statement or section that follows from and supports the information or explanation presented.

**W.8.4.** Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

**W.8.5.** With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

**W.8.6.** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.

**W.8.7.** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

**SL.8.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

A. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

B. Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

C. Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.

D. Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.

**SL.8.2.** Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

**SL.8.3.** Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and relevance and sufficiency of the evidence and identifying when irrelevant evidence is introduced.

**SL.8.5.** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

#### Integration of 21st Century Themes and Skills

##### 21st Century Skills/ Career Ready Practices:

**CRP1. Act as a responsible and contributing citizen and employee.**

**CRP2. Apply appropriate academic and technical skills.**

**CRP3. Attend to personal health and financial well-being.**

**CRP4. Communicate clearly and effectively and with reason.**

**CRP5. Consider the environmental, social and economic impacts of decisions.**

**CRP6. Demonstrate creativity and innovation.**

**CRP7. Employ valid and reliable research strategies.**

**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**

**CRP9. Model integrity, ethical leadership and effective management.**

**CRP10. Plan education and career paths aligned to personal goals.**

**CRP11. Use technology to enhance productivity.**

**CRP12. Work productively in teams while using cultural global competence.**

[Link to GHS Career Standards 9.2 Crosswalk Doc](#)

#### 2014 Technology Standards

##### 2014 NJ Technology Standards:

**8.1 Educational Technology** ([Word](#) | [PDF](#))

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

**8.2 Technology Education, Engineering, Design and Computational Thinking - Programming**

([Word](#) | [PDF](#))

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Please see relevant projects for technology standards [8.1](#) and [8.2](#):

**Differentiation / Accommodations / Modifications**

See [Appendix 3: Modifications](#)

**Pacing:** 5 weeks

## Unit 2: Motion and Forces: Newton's Laws

### Standards and Suggested Activities

MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

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.

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3. Analyze data from tests to determine similarities and differences

- Kinesthetic activities
- Classroom demonstrations
- Egg Drop Design project
- Rocket Lab
- Marble collision demos
- balloon rocket demos

### Skills and Knowledge

Students will be able to:

- Define and describe contact and non-contact forces.
- describe the Law of Universal Gravitation with respect to mass and distance.
- define friction as a force that resists motion.
- describe the motion of an object in terms of the net forces acting upon it. (Newton's First Law)
- identify and diagram the forces acting on an object at rest and in motion.
- explain how acceleration results from the net forces acting on an object. (Newton's Second Law)
- Use Newton's Second Law to describe the circular motion of satellites.
- describe the motion of a rocket in terms of action and reaction (Newton's Third Law)
- Apply Newton's Laws to calculate variables to define the motion of an object in a given situation.
- Use the Law of the Conservation of Momentum to predict the motion of objects after a collision.
- design and test a compartment that successfully absorbs force from a predetermined altitude and evaluate their design for further modifications.
- Construct and launch a model rocket and critique all aspects of its performance.

**Integration of Science & Engineering Practices, Disciplinary Core Ideas & Crosscutting Concepts expected in every unit.**

[Matrix of Science & Engineering Practices](#)

[Matrix of Disciplinary Core Ideas](#)

[Matrix of Crosscutting Concepts](#)

<p>among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.</p> <p>MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.</p>		
<p><b>District/School Formative Assessment Plan</b></p>	<p><b>District/School Summative Assessment Plan</b></p>	
<ul style="list-style-type: none"> <li>● Class discussions in which student share prior knowledge</li> <li>● Study Island</li> <li>● Quizzes</li> <li>● <a href="#">Gr. 8 NJSLA-Science Practice Tests</a></li> </ul>	<ul style="list-style-type: none"> <li>● Teacher-created quizzes</li> <li>● Teacher-created unit assessments</li> <li>● Labs</li> <li>● Gr. 8 NJSLA</li> </ul>	
<p><b>Core Instructional Materials</b></p>	<p><b>District/School Supplementary Resources</b></p>	
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<p><b>Interdisciplinary Connections throughout the K-12 Curriculum</b></p> <p><a href="#">See Appendix 1: Reading &amp; Writing Companion Standards for Science</a></p> <p><b><i>Mathematics</i></b></p> <p><b>MP.2</b> Reason abstractly and quantitatively. (MS-PS2-1),(MS-PS2-2) (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3),(MS-ETS1-4)</p> <p><b>6.NS.C.5</b> Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. (MS-PS2-1)</p> <p><b>6.EE.A.2</b> Write, read, and evaluate expressions in which letters stand for numbers. (MS-PS2-1),(MS-PS2-2)</p> <p><b>7.EE.B.3</b> Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. (MS-PS2-1),(MS-PS2-2)</p> <p><b>7.EE.B.4</b> Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by</p>
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reasoning about the quantities. (MS-PS2-1),(MS-PS2-2)

**7.EE.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3)

**7.SP** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. (MS-ETS1-4)

***English-Language Arts:***

**RI.8.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

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**Integration of 21st Century Themes and Skills**

**21st Century Skills/ Career Ready Practices:**

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  - CRP10. Plan education and career paths aligned to personal goals.**
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 All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
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<b>Differentiation / Accommodations / Modifications</b>	
See <a href="#">Appendix 3: Modifications</a>	

Pacing: 2 weeks Solar Car design project: 3 weeks		<b>Unit 3: Motion and Forces: Work and Simple Machines            and Solar Sprints solar car design project</b>	
<b>Standards and Suggested Activities</b>		<b>Skills and Knowledge</b>	
<p>MS-PS2-2. Plan an investigation to provide evidence that the change in an object’s motion depends on the sum of the forces on the object and the mass of the object.</p> <p>MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system</p> <p>MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.</p> <p>MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.</p> <p>MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.</p> <p>MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● work and power demos</li> <li>● simple machine activities</li> <li>● solar car project</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● define work in terms of force and distance and perform associated calculations.</li> <li>● explain the relationship between work and energy.</li> <li>● apply the Law of the Conservation of Energy to a closed system.</li> <li>● differentiate between kinetic and potential energy.</li> <li>● calculate power requirements from given work criteria.</li> <li>● describe how simple machines affect how work is done.</li> <li>● distinguish between mechanical advantage and efficiency.</li> <li>● calculate mechanical advantage and efficiency of a given system.</li> <li>● design and construct a solar car to meet established criteria</li> <li>● test and modify their solar car designs for maximized performance.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	

<p>into a new solution to better meet the criteria for success.</p> <p>MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.</p>		
<b>District/School Formative Assessment Plan</b>		<b>District/School Summative Assessment Plan</b>
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**Interdisciplinary Connections throughout the K-12 Curriculum**

[See Appendix 1: Reading & Writing Companion Standards for Science](#)

***Mathematics:***

**MP.2** Reason abstractly and quantitatively. (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3),(MS-ETS1-4) (MS-PS3-5) (MS-PS2-2)

**6.EE.A.2** Write, read, and evaluate expressions in which letters stand for numbers. (MS-PS2-2)

**7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. (MS-PS2-2)

**7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. (MS-PS2-2)

**7.EE.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3)

**6.RP.A.1** Understand the concept of ratio and use ratio language to describe a ratio relationship between two quantities. (MS-PS3-5)

**7.SP** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. (MS-ETS1-4)

**7.RP.A.2** Recognize and represent proportional relationships between quantities. (MS-PS3-5)

**8.F.A.3** Interpret the equation  $y = mx + b$  as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. (MS-PS3-5)

***English-Language Arts:***

**RI.8.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

**RI.8.5.** Analyze the structure an author uses to organize a specific paragraph in a text, including the role of particular sentences, to develop and to refine a key concept.

**RI.8.6.** Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.

**RI.8.7.** Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.

**W.8.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).

B. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

C. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

D. Use precise language and domain-specific vocabulary to inform about or explain the topic.

E. Establish and maintain a formal style/academic style, approach, and form.

F. Provide a concluding statement or section that follows from and supports the information or explanation presented.

**W.8.4.** Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

**W.8.5.** With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

**W.8.6.** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.

**W.8.7.** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

**SL.8.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

A. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

B. Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

C. Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.

D. Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.

**SL.8.2.** Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

**SL.8.3.** Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and relevance and sufficiency of the evidence and identifying when irrelevant evidence is introduced.

**SL.8.5.** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

<b>Integration of 21st Century Themes and Skills</b>	
<u><a href="#">21st Century Skills/ Career Ready Practices:</a></u>	<p>CRP1. Act as a responsible and contributing citizen and employee.</p> <p>CRP2. Apply appropriate academic and technical skills.</p> <p>CRP3. Attend to personal health and financial well-being.</p> <p>CRP4. Communicate clearly and effectively and with reason.</p> <p>CRP5. Consider the environmental, social and economic impacts of decisions.</p> <p>CRP6. Demonstrate creativity and innovation.</p> <p>CRP7. Employ valid and reliable research strategies.</p> <p>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</p> <p>CRP9. Model integrity, ethical leadership and effective management.</p> <p>CRP10. Plan education and career paths aligned to personal goals.</p> <p>CRP11. Use technology to enhance productivity.</p> <p>CRP12. Work productively in teams while using cultural global competence.</p> <p><u><a href="#">Link to GHS Career Standards 9.2Crosswalk Doc</a></u></p>
<b>2014 Technology Standards</b>	
<u><a href="#">2014 NJ Technology Standards:</a></u>	<p><b>8.1 Educational Technology</b> (<u><a href="#">Word</a></u>   <u><a href="#">PDF</a></u>)  All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.</p> <p><b>8.2 Technology Education, Engineering, Design and Computational Thinking - Programming</b>  (<u><a href="#">Word</a></u>   <u><a href="#">PDF</a></u>)  All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.</p> <p>Please see relevant projects for technology standards <u><a href="#">8.1</a></u> and <u><a href="#">8.2</a></u>:</p>

**Differentiation / Accommodations / Modifications**

See [Appendix 3: Modifications](#)

Pacing: 4 weeks		Unit 4: Motion and Forces: Force and Fluids	
Standards and Suggested Activities		Skills and Knowledge	
<p>MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.</p> <p>MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.</p>	<ul style="list-style-type: none"> <li>• Kinesthetic activities</li> <li>• Classroom demonstrations</li> <li>• cartesian diver</li> <li>• barometer</li> <li>• bell jar demos</li> <li>• hydraulics lab</li> <li>• soda can activity</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• describe pressure as a relationship between force and area.</li> <li>• measure and complete pressure calculations from given criteria.</li> <li>• distinguish between a liquid and a fluid.</li> <li>• describe the relationship between a fluid's pressure and its height.</li> <li>• discuss variations in air pressure on Earth.</li> <li>• apply Archimede's Principle correctly.</li> <li>• use Pascal's Principle to explain how hydraulic systems work.</li> <li>• demonstrate the relationship between fluid pressure and fluid velocity using Bernoulli's Principle.</li> <li>• identify and describe the four forces of flight.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	
District/School Formative Assessment Plan		District/School Summative Assessment Plan	
<ul style="list-style-type: none"> <li>• Class discussions in which student share prior knowledge</li> <li>• Study Island</li> <li>• Quizzes</li> <li>• <a href="#">Gr. 8 NJSLA-Science Practice Tests</a></li> </ul>		<ul style="list-style-type: none"> <li>• Teacher-created quizzes</li> <li>• Teacher-created unit assessments</li> <li>• Labs</li> <li>• Gr. 8 NJSLA</li> </ul>	
Core Instructional Materials		District/School Supplementary Resources	
<ul style="list-style-type: none"> <li>• <i>Glencoe iScience Physical Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>• Discovery Education videos</li> <li>• Glencoe ConnectEd online resources</li> <li>• <a href="#">Leveled articles/text: Newsela</a></li> </ul>	

## Interdisciplinary Connections throughout the K-12 Curriculum

### [See Appendix 1: Reading & Writing Companion Standards for Science](#)

#### Mathematics –

**MP.2** Reason abstractly and quantitatively. (MS-PS2-2) (MS-PS3-1)

**6.RP.A.1** Understand the concept of ratio and use ratio language to describe a ratio relationship between two quantities. (MS-PS3-1)

**6.RP.A.2** Understand the concept of a unit rate  $a/b$  associated with a ratio  $a:b$  with  $b \neq 0$ , and use rate language in the context of a ratio relationship. (MS-PS3-1)

**7.RP.A.2** Recognize and represent proportional relationships between quantities. (MS-PS3-1)

**6.EE.A.2** Write, read, and evaluate expressions in which letters stand for numbers. (MS-PS2-2)

**7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. (MS-PS2-2)

**7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. (MS-PS2-2)

**8.EE.A.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions. (MS-PS3-1)

**8.EE.A.2** Use square root and cube root symbols to represent solutions to equations of the form  $x^2 = p$  and  $x^3 = p$ , where  $p$  is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that  $\sqrt{2}$  is irrational. (MS-PS3-1)

**8.F.A.3** Interpret the equation  $y = mx + b$  as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. (MS-PS3-1)

#### English-Language Arts:

**RI.8.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

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**RI.8.7.** Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.

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B. Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

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**SL.8.2.** Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

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**Integration of 21st Century Themes and Skills**

<a href="#"><u>21st Century Skills/ Career Ready Practices:</u></a>	<p><b>CRP1. Act as a responsible and contributing citizen and employee.</b></p> <p><b>CRP2. Apply appropriate academic and technical skills.</b></p> <p><b>CRP3. Attend to personal health and financial well-being.</b></p> <p><b>CRP4. Communicate clearly and effectively and with reason.</b></p> <p><b>CRP5. Consider the environmental, social and economic impacts of decisions.</b></p> <p><b>CRP6. Demonstrate creativity and innovation.</b></p> <p><b>CRP7. Employ valid and reliable research strategies.</b></p> <p><b>CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.</b></p> <p><b>CRP9. Model integrity, ethical leadership and effective management.</b></p> <p><b>CRP10. Plan education and career paths aligned to personal goals.</b></p> <p><b>CRP11. Use technology to enhance productivity.</b></p> <p><b>CRP12. Work productively in teams while using cultural global competence.</b></p> <p><a href="#"><u>Link to GHS Career Standards 9.2Crosswalk Doc</u></a></p>
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**2014 Technology Standards**

<a href="#"><u>2014 NJ Technology Standards:</u></a>	<p><b>8.1 Educational Technology (<a href="#">Word</a>   <a href="#">PDF</a>)</b> All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.</p> <p><b>8.2 Technology Education, Engineering, Design and Computational Thinking - Programming</b> (<a href="#">Word</a>   <a href="#">PDF</a>)</p>
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All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Please see relevant projects for technology standards [8.1](#) and [8.2](#):

**Differentiation / Accommodations / Modifications**

See [Appendix 3: Modifications](#)

**Pacing:** 3 weeks

## Unit 5: Energy and Thermal Energy

### Standards and Suggested Activities

MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.

MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.

MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer

MS-PS3-4. Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample

MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the

- Kinesthetic activities
- Classroom demonstrations
- specific heat demo with sand and water
- thermal expansion demo
- temperature conversion activity
- insulated container design project

### Skills and Knowledge

Students will be able to:

- differentiate between kinetic and potential energy.
- describe the various types of potential energy.
- identify and describe the main forms of energy: sound, thermal, electrical, radiant, nuclear, and mechanical.
- explain how the law of the conservation of energy applies to energy transformations within a system.
- distinguish between Kelvin, Fahrenheit, and Celsius temperature scales.
- differentiate between thermal energy and temperature.
- describe the transfer of heat in terms of radiation, conduction, and convection.
- compare the specific heats of various materials and explain the reason for the differences.
- contrast thermal expansion and contraction.
- design an insulated container to meet established criteria and evaluate for further modifications.

**Integration of Science & Engineering Practices, Disciplinary Core Ideas & Crosscutting Concepts expected in every unit.**

[Matrix of Science & Engineering Practices](#)

[Matrix of Disciplinary Core Ideas](#)

[Matrix of Crosscutting Concepts](#)

<p>criteria and constraints of the problem.</p> <p>MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.</p> <p>MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.</p>		
<b>District/School Formative Assessment Plan</b>		<b>District/School Summative Assessment Plan</b>
<ul style="list-style-type: none"> <li>• Class discussions in which student share prior knowledge</li> <li>• Study Island</li> <li>• Quizzes</li> <li>• <a href="#">Gr. 8 NJSLA-Science Practice Tests</a></li> </ul>		<ul style="list-style-type: none"> <li>• Teacher-created quizzes</li> <li>• Teacher-created unit assessments</li> <li>• Labs</li> <li>• Gr. 8 NJSLA</li> </ul>
<b>Core Instructional Materials</b>		<b>District/School Supplementary Resources</b>
<ul style="list-style-type: none"> <li>• <i>Glencoe iScience Physical Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>• Discovery Education videos</li> <li>• Glencoe ConnectEd online resources</li> <li>• <a href="#">Leveled articles/text: Newsela</a></li> </ul>

### Interdisciplinary Connections throughout the K-12 Curriculum

#### [See Appendix 1: Reading & Writing Companion Standards for Science](#)

##### **Mathematics**

- MP.2** Reason abstractly and quantitatively. (MS-PS3-1),(MS-PS3-4),(MS-PS3-5) (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3) (MS-ETS1-4)
- 6.RP.A.1** Understand the concept of ratio and use ratio language to describe a ratio relationship between two quantities. (MS-PS3-1),(MS-PS3-5)
- 6.RP.A.2** Understand the concept of a unit rate  $a/b$  associated with a ratio  $a:b$  with  $b \neq 0$ , and use rate language in the context of a ratio relationship. (MS-PS3-1)
- 7.RP.A.2** Recognize and represent proportional relationships between quantities. (MS-PS3-1),(MS-PS3-5)
- 8.EE.A.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions. (MS-PS3-1)
- 8.EE.A.2** Use square root and cube root symbols to represent solutions to equations of the form  $x^2 = p$  and  $x^3 = p$ , where  $p$  is a positive rational number. Evaluate

square roots of small perfect squares and cube roots of small perfect cubes. Know that  $\sqrt{2}$  is irrational. (MS-PS3-1)

**8.F.A.3** Interpret the equation  $y = mx + b$  as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. (MS-PS3-1),(MSPS3-5)

**6.SP.B.5** Summarize numerical data sets in relation to their context. (MS-PS3-4)

**7.EE.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. (MS-ETS1-1),(MS-ETS1-2),(MS-ETS1-3)

**7.SP** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. (MS-ETS1-4)

**English-Language Arts:**

**RI.8.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

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**Integration of 21st Century Themes and Skills**

**21st Century Skills/ Career Ready Practices:**

- CRP1. Act as a responsible and contributing citizen and employee.**
  - CRP2. Apply appropriate academic and technical skills.**
  - CRP3. Attend to personal health and financial well-being.**
  - CRP4. Communicate clearly and effectively and with reason.**
  - CRP5. Consider the environmental, social and economic impacts of decisions.**
  - CRP6. Demonstrate creativity and innovation.**
  - CRP7. Employ valid and reliable research strategies.**
  - CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**
  - CRP9. Model integrity, ethical leadership and effective management.**
  - CRP10. Plan education and career paths aligned to personal goals.**
  - CRP11. Use technology to enhance productivity.**
  - CRP12. Work productively in teams while using cultural global competence.**
- [Link to GHS Career Standards 9.2Crosswalk Doc](#)

**2014 Technology Standards**

**2014 NJ Technology Standards:**

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 All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
- 8.2 Technology Education, Engineering, Design and Computational Thinking - Programming ([Word](#) | [PDF](#))**  
 All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

**Differentiation / Accommodations / Modifications**

See [Appendix 3: Modifications](#)

Pacing: 3 weeks		<b>Unit 6: Foundations of Chemistry</b>	
<b>Standards and Suggested Activities</b>		<b>Skills and Knowledge</b>	
<p>MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.</p> <p>MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.</p> <p>MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.</p> <p>MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.</p> <p>MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.</p> <p>MS-PS1-6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● mystery mixture lab</li> <li>● Zn and HCl lab</li> <li>● pH lab</li> <li>● Na and Mg demos</li> <li>● Alka-Seltzer demo</li> <li>● Mentos activity</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● classify matter as elements, compounds or mixtures</li> <li>● define the characteristics of elements, compounds, and mixtures</li> <li>● describe the structure of an atom.</li> <li>● make distinctions between heterogeneous and homogeneous mixtures.</li> <li>● describe the organization of the Periodic Table of the Elements.</li> <li>● identify the structure of an element's atom based on the Periodic Table.</li> <li>● define the characteristics of metals, metalloids, and non-metals.</li> <li>● describe matter in terms of its physical properties.</li> <li>● distinguish between size-dependent and size-independent physical properties.</li> <li>● describe the state of matter of a substance in terms of the thermal energy of its particles.</li> <li>● explain the difference between physical and chemical properties.</li> <li>● differentiate between physical and chemical changes.</li> <li>● identify the signs of a chemical change.</li> <li>● demonstrate how chemical equations are used to detail the conservation of mass during a chemical reaction.</li> <li>● indicate how to speed up and slow down a chemical reaction.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	

District/School Formative Assessment Plan	District/School Summative Assessment Plan
<ul style="list-style-type: none"> <li>• Class discussions in which student share prior knowledge</li> <li>• Study Island</li> <li>• Quizzes</li> <li>• <a href="#">Gr. 8 NJSLA-Science Practice Tests</a></li> </ul>	<ul style="list-style-type: none"> <li>• Teacher-created quizzes</li> <li>• Teacher-created unit assessments</li> <li>• Labs</li> <li>• Gr. 8 NJSLA</li> </ul>
Core Instructional Materials	District/School Supplementary Resources
<ul style="list-style-type: none"> <li>• <i>Glencoe iScience Physical Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>	<ul style="list-style-type: none"> <li>• Discovery Education videos</li> <li>• Glencoe ConnectEd online resources</li> <li>• <a href="#">Leveled articles/text: Newsela</a></li> </ul>

### Interdisciplinary Connections throughout the K-12 Curriculum

#### [See Appendix 1: Reading & Writing Companion Standards for Science](#)

##### Mathematics

**MP.2** Reason abstractly and quantitatively. (MS-PS1-1),(MS-PS1-2),(MS-PS1-5) **MP.4** Model with mathematics. (MS-PS1-1),(MS-PS1-5)

**6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems. (MS-PS1-1),(MS-PS1-2),(MS-PS1-5) **6.NS.C.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. (MS-PS1-4)

**8.EE.A.3** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. (MS-PS1-1)

**6.SP.B.4** Display numerical data in plots on a number line, including dot plots, histograms, and box plots. (MS-PS1-2) **6.SP.B.5** Summarize numerical data sets in relation to their context (MS-PS1-2)

##### English-Language Arts:

**RI.8.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

**RI.8.5.** Analyze the structure an author uses to organize a specific paragraph in a text, including the role of particular sentences, to develop and to refine a key concept.

**RI.8.6.** Determine an author’s point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.

**RI.8.7.** Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.

**W.8.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).

B. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

C. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

D. Use precise language and domain-specific vocabulary to inform about or explain the topic.

E. Establish and maintain a formal style/academic style, approach, and form.

F. Provide a concluding statement or section that follows from and supports the information or explanation presented.

**W.8.4.** Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

**W.8.5.** With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

**W.8.6.** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.

**W.8.7.** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

**SL.8.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others’ ideas and expressing their own clearly.

A. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

B. Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

C. Pose questions that connect the ideas of several speakers and respond to others’ questions and comments with relevant evidence, observations, and ideas.

D. Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.

**SL.8.2.** Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

**SL.8.3.** Delineate a speaker’s argument and specific claims, evaluating the soundness of the reasoning and relevance and sufficiency of the evidence and identifying when irrelevant evidence is introduced.

**SL.8.5.** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

#### Integration of 21st Century Themes and Skills

##### 21st Century Skills/ Career Ready Practices:

- CRP1. Act as a responsible and contributing citizen and employee.**
  - CRP2. Apply appropriate academic and technical skills.**
  - CRP3. Attend to personal health and financial well-being.**
  - CRP4. Communicate clearly and effectively and with reason.**
  - CRP5. Consider the environmental, social and economic impacts of decisions.**
  - CRP6. Demonstrate creativity and innovation.**
  - CRP7. Employ valid and reliable research strategies.**
  - CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**
  - CRP9. Model integrity, ethical leadership and effective management.**
  - CRP10. Plan education and career paths aligned to personal goals.**
  - CRP11. Use technology to enhance productivity.**
  - CRP12. Work productively in teams while using cultural global competence.**
- [Link to GHS Career Standards 9.2Crosswalk Doc](#)

#### 2014 Technology Standards

##### 2014 NJ Technology Standards:

##### **8.1 Educational Technology** ([Word](#) | [PDF](#))

All students will use digital tools to access, manage, evaluate, and synthesize information in order

to solve problems individually and collaborate and create and communicate knowledge.

**8.2 Technology Education, Engineering, Design and Computational Thinking - Programming**  
([Word](#) | [PDF](#))

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Please see relevant projects for technology standards [8.1](#) and [8.2](#):

**Differentiation / Accommodations / Modifications**

See [Appendix 3: Modifications](#)

Pacing: 2 weeks		Unit 7: Elements and Chemical Bonds	
Standards and Suggested Activities		Skills and Knowledge	
<p>MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.</p> <p>MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.</p> <p>MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.</p> <p>MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● Ionic bonding lab</li> <li>● Covalent bonding lab</li> <li>● Chemistry demos</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● differentiate between the electron energy levels within an atom.</li> <li>● use the Periodic Table to determine the configuration of an atom's valence electrons and construct an electron-dot diagram.</li> <li>● describe the characteristics of noble gases, halogens, and alkali metal groups.</li> <li>● explain that atoms bond to form molecules.</li> <li>● describe how energy is transferred when bonds are formed or broken.</li> <li>● explain how covalent bonds form between two nonmetals.</li> <li>● distinguish between polar and nonpolar covalent bonding.</li> <li>● describe how ionic bonds form between a metal and a nonmetal.</li> <li>● explain how metallic bonds form between two metals.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b>  <a href="#">Matrix of Science &amp; Engineering Practices</a>  <a href="#">Matrix of Disciplinary Core Ideas</a>  <a href="#">Matrix of Crosscutting Concepts</a></p>	
District/School Formative Assessment Plan		District/School Summative Assessment Plan	
<ul style="list-style-type: none"> <li>● Class discussions in which student share prior knowledge</li> <li>● Study Island</li> <li>● Quizzes</li> <li>● <a href="#">Gr. 8 NJSLA-Science Practice Tests</a></li> </ul>		<ul style="list-style-type: none"> <li>● Teacher-created quizzes</li> <li>● Teacher-created unit assessments</li> <li>● Labs</li> <li>● Gr. 8 NJSLA</li> </ul>	
Core Instructional Materials		District/School Supplementary Resources	
<ul style="list-style-type: none"> <li>● <i>Glencoe iScience Physical Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>● Discovery Education videos</li> <li>● Glencoe ConnectEd online resources</li> <li>● <a href="#">Leveled articles/text: Newsela</a></li> </ul>	

## Interdisciplinary Connections throughout the K-12 Curriculum

### [See Appendix 1: Reading & Writing Companion Standards for Science](#)

#### ***Mathematics***

**MP.2** Reason abstractly and quantitatively. (MS-PS1-1),(MS-PS1-2),(MS-PS1-5)

**MP.4** Model with mathematics. (MS-PS1-1),(MS-PS1-5)

**6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems. (MS-PS1-1),(MS-PS1-2),(MS-PS1-5)

**6.NS.C.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. (MS-PS1-4)

**8.EE.A.3** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. (MS-PS1-1)

**6.SP.B.4** Display numerical data in plots on a number line, including dot plots, histograms, and box plots. (MS-PS1-2)

**6.SP.B.5** Summarize numerical data sets in relation to their context (MS-PS1-2)

#### ***English-Language Arts:***

**RI.8.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

**RI.8.5.** Analyze the structure an author uses to organize a specific paragraph in a text, including the role of particular sentences, to develop and to refine a key concept.

**RI.8.6.** Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.

**RI.8.7.** Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.

**W.8.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).

B. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

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D. Use precise language and domain-specific vocabulary to inform about or explain the topic.

E. Establish and maintain a formal style/academic style, approach, and form.

F. Provide a concluding statement or section that follows from and supports the information or explanation presented.

**W.8.4.** Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

**W.8.5.** With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

**W.8.6.** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.

**W.8.7.** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

**SL.8.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

A. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

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**SL.8.2.** Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.

**SL.8.3.** Delineate a speaker's argument and specific claims, evaluating the soundness of the reasoning and relevance and sufficiency of the evidence and identifying when irrelevant evidence is introduced.

**SL.8.5.** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

#### Integration of 21st Century Themes and Skills

##### 21st Century Skills/ Career Ready Practices:

**CRP1. Act as a responsible and contributing citizen and employee.**

**CRP2. Apply appropriate academic and technical skills.**

**CRP3. Attend to personal health and financial well-being.**

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**CRP5. Consider the environmental, social and economic impacts of decisions.**

**CRP6. Demonstrate creativity and innovation.**

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**CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**

**CRP9. Model integrity, ethical leadership and effective management.**

**CRP10. Plan education and career paths aligned to personal goals.**

**CRP11. Use technology to enhance productivity.**

**CRP12. Work productively in teams while using cultural global competence.**

[Link to GHS Career Standards 9.2Crosswalk Doc](#)

#### 2014 Technology Standards

##### 2014 NJ Technology Standards:

**8.1 Educational Technology** ([Word](#) | [PDF](#))

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

**8.2 Technology Education, Engineering, Design and Computational Thinking - Programming** ([Word](#) | [PDF](#))

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

**Differentiation / Accommodations / Modifications**

See [Appendix 3: Modifications](#)

Pacing: 3 weeks		Unit 8: Atmosphere	
Standards and Suggested Activities		Skills and Knowledge	
<p>MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.</p> <p>MS-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.</p> <p>MS-ESS2-6. Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.</p> <p>MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● layers of the atmosphere activity</li> <li>● convection tank demo</li> <li>● heating and cooling of water lab</li> <li>● greenhouse effect activity</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● identify components of Earth's atmosphere.</li> <li>● detail the layers of Earth's atmosphere and their characteristics.</li> <li>● describe how energy transfer in the atmosphere occurs.</li> <li>● distinguish between radiation, conduction, and convection.</li> <li>● evaluate and graph the role of latent heat in energy storage</li> <li>● explain how the Greenhouse Effect occurs and its importance</li> <li>● identify and appraise current arguments related to climate change.</li> <li>● name and describe the four major global air currents</li> <li>● relate the Coriolis Effect to global wind systems.</li> <li>● distinguish between local and global winds.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b></p> <p><a href="#">Matrix of Science &amp; Engineering Practices</a></p> <p><a href="#">Matrix of Disciplinary Core Ideas</a></p> <p><a href="#">Matrix of Crosscutting Concepts</a></p>	
District/School Formative Assessment Plan		District/School Summative Assessment Plan	
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Core Instructional Materials		District/School Supplementary Resources	
<ul style="list-style-type: none"> <li>● <i>Glencoe iScience Earth and Space Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>● Discovery Education videos</li> <li>● Glencoe ConnectEd online resources</li> <li>● <a href="#">Leveled articles/text: Newsela</a></li> </ul>	

## Interdisciplinary Connections throughout the K-12 Curriculum

### [See Appendix 1: Reading & Writing Companion Standards for Science](#)

#### ***Mathematics***

**MP.2** Reason abstractly and quantitatively. (MS-ESS3-5)

**6.EE.B.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-ESS3-5)

**7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. (MS-ESS3-5)

#### ***English-Language Arts:***

**RI.8.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

**RI.8.5.** Analyze the structure an author uses to organize a specific paragraph in a text, including the role of particular sentences, to develop and to refine a key concept.

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### Integration of 21st Century Themes and Skills

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[Link to GHS Career Standards 9.2 Crosswalk Doc](#)

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All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

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All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Please see relevant projects for technology standards [8.1](#) and [8.2](#):

### Differentiation / Accommodations / Modifications

See [Appendix 3: Modifications](#)

Pacing: 3 weeks		Unit 9: Weather	
Standards and Suggested Activities		Skills and Knowledge	
<p>MS-ESS2-1. Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process.</p> <p>MS-ESS2-4. Develop a model to describe the cycling of water through Earth’s systems driven by energy from the sun and the force of gravity.</p> <p>MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions</p> <p>MS-ESS2-6. Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.</p>	<ul style="list-style-type: none"> <li>● Kinesthetic activities</li> <li>● Classroom demonstrations</li> <li>● weekly weather variables tracking activity</li> <li>● cloud formation demo</li> <li>● relative humidity and dew point chart activity</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● identify and explain the variables used to describe the weather.</li> <li>● differentiate the various cloud types and identify the weather associated with each.</li> <li>● demonstrate an understanding of high and low pressure systems.</li> <li>● identify characteristics of the major air masses that affect weather patterns in North America.</li> <li>● identify and describe the various types of fronts that occur at air mass boundaries and the weather patterns associated with each.</li> <li>● summarize the effect of oceanic circulation on weather and climate.</li> <li>● describe various instruments used for measuring weather.</li> <li>● graph and interpret data gathered from weather instruments.</li> <li>● interpret weather maps and predict future outcomes.</li> </ul> <p><b>Integration of Science &amp; Engineering Practices, Disciplinary Core Ideas &amp; Crosscutting Concepts expected in every unit.</b>  <a href="#">Matrix of Science &amp; Engineering Practices</a>  <a href="#">Matrix of Disciplinary Core Ideas</a>  <a href="#">Matrix of Crosscutting Concepts</a></p>	
District/School Formative Assessment Plan		District/School Summative Assessment Plan	
<ul style="list-style-type: none"> <li>● Class discussions in which student share prior knowledge</li> <li>● Study Island</li> <li>● Quizzes</li> <li>● <a href="#">Gr. 8 NJSLA-Science Practice Tests</a></li> </ul>		<ul style="list-style-type: none"> <li>● Teacher-created quizzes</li> <li>● Teacher-created unit assessments</li> <li>● Labs</li> <li>● Gr. 8 NJSLA</li> </ul>	
Core Instructional Materials		District/School Supplementary Resources	
<ul style="list-style-type: none"> <li>● <i>Glencoe iScience Earth and Space Science Series</i> (Mcgraw-Hill Companies, Inc. 2012)</li> </ul>		<ul style="list-style-type: none"> <li>● Discovery Education videos</li> <li>● Glencoe ConnectEd online resources</li> <li>● <a href="#">Leveled articles/text: Newsela</a></li> </ul>	

## Interdisciplinary Connections throughout the K-12 Curriculum

### [See Appendix 1: Reading & Writing Companion Standards for Science](#)

#### **Mathematics**

MP.2 Reason abstractly and quantitatively. (MS-ESS2-5)

6.NS.C.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. (MS-ESS2-5)

#### **English-Language Arts:**

**RI.8.4.** Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

**RI.8.5.** Analyze the structure an author uses to organize a specific paragraph in a text, including the role of particular sentences, to develop and to refine a key concept.

**RI.8.6.** Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.

**RI.8.7.** Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.

**W.8.2.** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

A. Introduce a topic and organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia).

B. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

C. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

D. Use precise language and domain-specific vocabulary to inform about or explain the topic.

E. Establish and maintain a formal style/academic style, approach, and form.

F. Provide a concluding statement or section that follows from and supports the information or explanation presented.

**W.8.4.** Produce clear and coherent writing in which the development, organization, voice and style are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)

**W.8.5.** With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

**W.8.6.** Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.

**W.8.7.** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

**SL.8.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

A. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

B. Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

C. Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.

D. Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.  
**SL.8.2.** Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.  
**SL.8.3.** Delineate a speaker’s argument and specific claims, evaluating the soundness of the reasoning and relevance and sufficiency of the evidence and identifying when irrelevant evidence is introduced.  
**SL.8.5.** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

**Integration of 21st Century Themes and Skills**

**21st Century Skills/ Career Ready Practices:**

- CRP1. Act as a responsible and contributing citizen and employee.**
  - CRP2. Apply appropriate academic and technical skills.**
  - CRP3. Attend to personal health and financial well-being.**
  - CRP4. Communicate clearly and effectively and with reason.**
  - CRP5. Consider the environmental, social and economic impacts of decisions.**
  - CRP6. Demonstrate creativity and innovation.**
  - CRP7. Employ valid and reliable research strategies.**
  - CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.**
  - CRP9. Model integrity, ethical leadership and effective management.**
  - CRP10. Plan education and career paths aligned to personal goals.**
  - CRP11. Use technology to enhance productivity.**
  - CRP12. Work productively in teams while using cultural global competence.**
- [Link to GHS Career Standards 9.2Crosswalk Doc](#)

**2014 Technology Standards**

**2014 NJ Technology Standards:**

- 8.1 Educational Technology ([Word](#) | [PDF](#))**  
 All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
- 8.2 Technology Education, Engineering, Design and Computational Thinking - Programming ([Word](#) | [PDF](#))**  
 All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
- Please see relevant projects for technology standards [8.1](#) and [8.2](#):

**Differentiation / Accommodations / Modifications**

See [Appendix 3: Modifications](#)

