### Science – Grade 8

**Cycle 1**

<table>
<thead>
<tr>
<th>Unit</th>
<th># Class Periods</th>
<th>Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1: Introduction to Chemistry</strong></td>
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</tbody>
</table>
| Students explore structures of atoms, describe properties of matter, construct atomic models, and explain the arrangement of elements found on the Period Table. | 11 class periods (90-minutes each) or 22 class periods (45-minutes each) | Science Process Standards:  
- SCI.8.1A Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.  
- SCI.8.2A Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.  
- SCI.8.2C Collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers.  
- SCI.8.2D Construct tables, using repeated trials and means, to organize data and identify patterns.  
- SCI.8.2E Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.  
- SCI.8.3A Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning and experimental and observational testing, so as to encourage critical thinking by the student.  
- SCI.8.3B Use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature.  
- SCI.8.3C Identify advantages and limitations of models such as size, scale, properties, and materials.  
- SCI.8.3D Relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.  
- SCI.8.4A Use appropriate tools to collect, record, and analyze information.  
- SCI.8.4B Use preventative safety equipment, including chemical splash goggles, aprons and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.  
| Labor Day Sept. 2 | SCI.8.5A Describe the structure of atoms including the masses, electrical charges and locations of protons and neutrons in the nucleus and electrons in the electron cloud.  
- SCI.8.5B Identify that protons determine an element’s identity, and valence electrons determine its chemical properties including reactivity.  
- SCI.8.5C Interpret the arrangement of the Periodic Table including groups and periods, to explain how properties are used to classify elements.  
- SCI.8.5D Recognize that chemical formulas are used to identify substances and determine the number of atoms of each element in chemical formulas containing subscripts. | Early Dismissal Sept. 27 |

The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.

**29 Days**

Aug. 26 - Oct. 4, 2019
### Cycle 2

<table>
<thead>
<tr>
<th>Unit</th>
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</thead>
</table>
| **Unit 2: Chemical Reactions** | 3 class periods (90-min. each) or 6 class periods (45-min. each) | **Science Process Standards:**
- **SCI.8.1A** Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.
- **SCI.8.2A** Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.
- **SCI.8.2C** Collect and record data using the International System of Units and qualitative means such as labeled drawings, writing, and graphic organizers.
- **SCI.8.2D** Construct tables, using repeated trials and means, to organize data and identify patterns.
- **SCI.8.2E** Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.
- **SCI.8.3A** Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning and experimental and observational testing, so as to encourage critical thinking by the student.
- **SCI.8.3B** Use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature.
- **SCI.8.3C** Identify advantages and limitations of models such as size, scale, properties, and materials.
- **SCI.8.3D** Relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.
- **SCI.8.4A** Use appropriate tools to collect, record, and analyze information.
- **SCI.8.4B** Use preventative safety equipment, including chemical splash goggles, aprons and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.

**Science Content Standards:**
- **SCI.8.5E** Investigate how evidence of chemical reactions indicates that new substances with different properties are formed and how that relates to the law of conservation of mass.

*Fall Holiday (students only)*

*Early Dismissals*  
- Oct. 9
- Oct. 18
- Nov. 8
**Cycle 2**

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</table>
| **Unit 3: Force and Motion Basics**<br>Students investigate and demonstrate how forces and motion are interrelated. | 7 class periods (90-min. each) or 14 class periods (45-min. each) | **Science Process Standards:**
- SCI.8.1A Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.
- SCI.8.2A Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.
- SCI.8.2C Collect and record data using the International System of Units and qualitative means such as labeled drawings, writing, and graphic organizers.
- SCI.8.2D Construct tables, using repeated trials and means, to organize data and identify patterns.
- SCI.8.2E Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.
- SCI.8.3A Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning and experimental and observational testing, so as to encourage critical thinking by the student.
- SCI.8.3B Use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature.
- SCI.8.3C Identify advantages and limitations of models such as size, scale, properties, and materials.
- SCI.8.3D Relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.
- SCI.8.4A Use appropriate tools to collect, record, and analyze information.
- SCI.8.4B Use preventative safety equipment, including chemical splash goggles, aprons and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.

**Science Content Standards:**
- SCI.8.6A Demonstrate and calculate how unbalanced forces change the speed or direction of an object’s motion.
- SCI.8.6B Differentiate between speed, velocity, and acceleration.
### Science – Grade 8

#### 2019-2020 Scope and Sequence

**Cycle 3**

Nov. 11 - Dec. 19, 2019

24 Days

The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.

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<tr>
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<tbody>
<tr>
<td><strong>Unit 4: Laws of Force and Motion</strong>&lt;br&gt;Students investigate the three laws of motion in everyday life situations.</td>
<td>3 class periods (90-min. each) or 6 class periods (45-min. each)</td>
<td>Science Process Standards:&lt;br&gt;SCI.8.1A Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.&lt;br&gt;SCI.8.2A Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.&lt;br&gt;SCI.8.2C Collect and record data using the International System of Units and qualitative means such as labeled drawings, writing, and graphic organizers.&lt;br&gt;SCI.8.2D Construct tables, using repeated trials and means, to organize data and identify patterns.&lt;br&gt;SCI.8.2E Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.&lt;br&gt;SCI.8.3A Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning and experimental and observational testing, so as to encourage critical thinking by the student.&lt;br&gt;SCI.8.3B Use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature.&lt;br&gt;SCI.8.3C Identify advantages and limitations of models such as size, scale, properties, and materials.&lt;br&gt;SCI.8.3D Relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.&lt;br&gt;SCI.8.4A Use appropriate tools to collect, record, and analyze information.&lt;br&gt;SCI.8.4B Use preventative safety equipment, including chemical splash goggles, aprons and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.&lt;br&gt;SCI.8.6C Investigate and describe applications of Newton’s three laws of motion such as in vehicle restraints, sports activities, amusement park rides, Earth’s tectonic activities, and rocket launches.</td>
</tr>
<tr>
<td><strong>Thanksgiving Break</strong>&lt;br&gt;Nov. 25-29</td>
<td><strong>Teacher Prep Day</strong>&lt;br&gt;Dec. 20</td>
<td><strong>Winter Break</strong>&lt;br&gt;Dec. 23 - Jan. 3</td>
</tr>
</tbody>
</table>
Cycle 3 | 24 Days | Nov. 11 - Dec. 19, 2019
--- | --- | ---
Unit 5: Earth, Sun, Moon | 7 class periods (90-min. each) or 14 class periods (45-min. each) | The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.

### Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs)

**The student will:**

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<th>Science Process Standards:</th>
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<tr>
<td>SCI.8.1A Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.</td>
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<tr>
<td>SCI.8.2A Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.</td>
</tr>
<tr>
<td>SCI.8.2C Collect and record data using the International System of Units and qualitative means such as labeled drawings, writing, and graphic organizers.</td>
</tr>
<tr>
<td>SCI.8.2D Construct tables, using repeated trials and means, to organize data and identify patterns.</td>
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<tr>
<td>SCI.8.2E Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.</td>
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<tr>
<td>SCI.8.3A Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning and experimental and observational testing, so as to encourage critical thinking by the student</td>
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<td>SCI.8.3B Use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature.</td>
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<td>SCI.8.3C Identify advantages and limitations of models such as size, scale, properties, and materials.</td>
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</table>

### Science Content Standards:

| SCI.8.7A Model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the sun causing changes in seasons. |
| SCI.8.7B Demonstrate and predict the sequence of events in the lunar cycle. |
| SCI.8.7C Relate the positions of the moon and sun to their effect on ocean tides. |
## Cycle 4

<table>
<thead>
<tr>
<th>Unit 6: The Universe</th>
<th># Class Periods</th>
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<tr>
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<td>The student will:</td>
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<td>7 class periods (90-min. each) or 14 class periods (45-min. each)</td>
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<tr>
<td></td>
<td>MLK Jr. Day Jan. 20</td>
<td>SCI.8.1A Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.</td>
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<tr>
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<td>Early Dismissals Jan. 18 Feb. 14</td>
<td>SCI.8.2A Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.</td>
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<td>SCI.8.2C Collect and record data using the International System of Units and qualitative means such as labeled drawings, writing, and graphic organizers.</td>
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<td>SCI.8.2D Construct tables, using repeated trials and means, to organize data and identify pattern.</td>
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<td>SCI.8.2E Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.</td>
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<td>SCI.8.3A Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning and experimental and observational testing, so as to encourage critical thinking by the student.</td>
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<td>SCI.8.3B Use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature.</td>
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<td>SCI.8.3C Identify advantages and limitations of models such as size, scale, properties, and materials.</td>
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<td>SCI.8.3D Relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.</td>
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<td>SCI.8.4A Use appropriate tools to collect, record, and analyze information.</td>
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<td>SCI.8.4B Use preventative safety equipment, including chemical splash goggles, aprons and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.</td>
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**Science Process Standards:**
- SCI.8.1A Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.
- SCI.8.2A Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.
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- SCI.8.4B Use preventative safety equipment, including chemical splash goggles, aprons and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.

**Science Content Standards:**
- SCI.8.8A Describe components of the universe, including stars, nebulae, and galaxies, and use models such as the Hertzsprung-Russell diagram for classification.
- SCI.8.8B Recognize that the Sun is a medium-sized star located in a spiral arm of the Milky Way galaxy and that the Sun is many thousands of times closer to Earth than any other star.
- SCI.8.8C Identify how different wavelengths of the electromagnetic spectrum such as visible light and radio waves are used to gain information about components in the universe.
- SCI.8.8D Research how scientific data are used as evidence to develop scientific theories to describe the origin of the universe.
### Unit 7: Atmospheric Movement

**Students research and investigate weather patterns and create models to describe the role of the ocean on the formation of weather systems.**

**# Class Periods**
- 5 class periods (90-min. each)
- 10 class periods (45-min. each)

**Texas Essential Knowledge and Skills/Student Expectations (TEKS/SEs)**

**Science Process Standards:**
- SCI.8.1A Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.
- SCI.8.2A Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.
- SCI.8.2C Collect and record data using the International System of Units and qualitative means such as labeled drawings, writing, and graphic organizers.
- SCI.8.2D Construct tables, using repeated trials and means, to organize data and identify patterns.
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- SCI.8.3C Identify advantages and limitations of models such as size, scale, properties, and materials.
- SCI.8.3D Relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.
- SCI.8.4A Use appropriate tools to collect, record, and analyze information.
- SCI.8.4B Use preventative safety equipment, including chemical splash goggles, aprons and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.

**Science Content Standards:**
- SCI.8.10A Recognize that the Sun provides the energy that drives convection within the atmosphere and oceans, producing winds.
- SCI.8.10B Identify how global patterns of atmospheric movement influence local weather using maps that show high and low pressures and fronts.
- SCI.8.10C Identify the role of the ocean in the formation of weather systems, such as hurricanes.
## Scope and Sequence

### Science – Grade 8

<table>
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<tr>
<th>Cycle 5</th>
<th>29 Days</th>
<th>Feb. 17 - Apr. 3, 2020</th>
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<tbody>
<tr>
<td>The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.</td>
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</table>
| **Unit 8:** Topographic Maps, Plate Tectonics, Satellite Images | 6 class periods (90-min. each) or 12 class periods (45-min. each) | **Science Process Standards:**  
- SCI.8.1A Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.  
- SCI.8.2A Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.  
- SCI.8.2C Collect and record data using the International System of Units and qualitative means such as labeled drawings, writing, and graphic organizers.  
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- SCI.8.3D Relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.  
- SCI.8.4A Use appropriate tools to collect, record, and analyze information.  
- SCI.8.4B Use preventative safety equipment, including chemical splash goggles, aprons and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.  |
| **Students relate plate tectonics to crustal features and interpret and explain changes in Earth’s features using topographic maps and satellite views.** | **Science Content Standards:**  
- SCI.8.9A Describe the historical development of evidence that supports plate tectonic theory.  
- SCI.8.9B Relate plate tectonics to the formation of crustal features.  
- SCI.8.9C Interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering. |
## Science – Grade 8

### Cycle 5

**29 Days**  
Feb. 17 - Apr. 3, 2020

The recommended number of class periods is less than the number of days in the grading cycle to accommodate differentiated instruction, extended learning time, and assessment days. Complete instructional planning information and support are in the HISD Curriculum documents.

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</table>
| **Unit 9: Ecosystems**              |                 | **Science Process Standards:**  
SCI.8.1A Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.  
SCI.8.2A Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.  
SCI.8.2C Collect and record data using the International System of Units and qualitative means such as labeled drawings, writing, and graphic organizers.  
SCI.8.2D Construct tables, using repeated trials and means, to organize data and identify patterns.  
SCI.8.2E Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.  
SCI.8.3A Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning and experimental and observational testing, so as to encourage critical thinking by the student.  
SCI.8.3B Use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature.  
SCI.8.3C Identify advantages and limitations of models such as size, scale, properties, and materials.  
SCI.8.3D Relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.  
SCI.8.4A Use appropriate tools to collect, record, and analyze information.  
SCI.8.4B Use preventative safety equipment, including chemical splash goggles, aprons and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.  

**Science Content Standards:**  
SCI.8.11A Investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition.  
SCI.8.11B Explore how short- and long-term environmental changes affect organisms and traits in subsequent populations.  
SCI.8.11C Recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems.

### Unit 9: Ecosystems

- Students investigate abiotic and biotic interactions within ecosystems and how human activities contribute to modifying Earth’s ecosystems.

- **6 class periods (90 minutes each)** or **12 class periods (45-min. each)**
### Cycle 6

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<tr>
<th>Unit</th>
<th># Class Periods</th>
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| Unit 10: Grade 8 Science STAAR Review | 13 class periods (90-min. each) or 26 class periods (45-min. each) | Science Content Standards:  
- **SCI.8.5A** Describe the structure of atoms including the masses, electrical charges and locations of protons and neutrons in the nucleus and electrons in the electron cloud.  
- **SCI.8.5B** Identify that protons determine an element’s identity, and valence electrons determine its chemical properties including reactivity.  
- **SCI.8.5C** Interpret the arrangement of the Periodic Table including groups and periods, to explain how properties are used to classify elements.  
- **SCI.8.5D** Recognize that chemical formulas are used to identify substances and determine the number of atoms of each element in chemical formulas containing subscripts.  
- **SCI.8.5E** Investigate how evidence of chemical reactions indicates that new substances with different properties are formed and how that relates to the law of conservation of mass.  
- **SCI.8.6A** Demonstrate and calculate how unbalanced forces change the speed or direction of an object’s motion.  
- **SCI.8.6B** Differentiate between speed, velocity, and acceleration.  
- **SCI.8.6C** Investigate and describe applications of Newton’s three laws of motion, such as in vehicle restraints, sports activities, amusement park rides, Earth’s tectonic activities, and rocket launches.  
- **SCI.8.7A** Model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the sun causing changes in seasons.  
- **SCI.8.7B** Demonstrate and predict the sequence of events in the lunar cycle.  
- **SCI.8.7C** Relate the position of the Moon and Sun to their effect on ocean tides.  
- **SCI.8.8A** Describe components of the universe, including stars, nebulae, and galaxies, and use models such as the Hertzsprung-Russell diagram for classification.  
- **SCI.8.8B** Recognize that the Sun is a medium-sized star located in a spiral arm of the Milky Way galaxy and that the Sun is many thousands of times closer to Earth than any other star.  
- **SCI.8.8C** Identify how different wavelengths of the electromagnetic spectrum such as visible light and radio waves are used to gain information about components in the universe.  
- **SCI.8.10A** Recognize that the Sun provides the energy that drives convection within the atmosphere and oceans, producing winds and ocean currents.  
- **SCI.8.10B** Identify how global patterns of atmospheric movement influence local weather using maps that show high and low pressures and fronts. |

**Spring Holiday**  
Apr. 10  
**Memorial Day**  
May 25
### Science – Grade 8

**Cycle 6**

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<tbody>
<tr>
<td></td>
<td></td>
<td>SCI.8.10C Identify the role of the ocean in the formation of weather systems, such as hurricanes.</td>
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<tr>
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<td></td>
<td>SCI.8.9A Describe the historical development of evidence that supports plate tectonic theory.</td>
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<td>SCI.8.9B Relate plate tectonics to the formation of crustal features.</td>
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<td></td>
<td>SCI.8.9C Interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering.</td>
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<td>SCI.8.11A Investigate how organisms and populations in an ecosystem depend on and may compete for biotic and abiotic factors such as quantity of light, water, range of temperatures, or soil composition.</td>
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<td>SCI.8.11B Explore how short- and long-term environmental changes affect organisms and traits in subsequent populations.</td>
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<td>SCI.8.11C Recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems.</td>
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**Unit 11: Biology PBL**

**4 class periods (90-min. each)**

**Science Process Standards:**

SCI.8.1A Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency-approved safety standards.

SCI.8.2A Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology.

SCI.8.2C Collect and record data using the International System of Units and qualitative means such as labeled drawings, writing, and graphic organizers.

SCI.8.2D Construct tables, using repeated trials and means, to organize data and identify patterns.

SCI.8.2E Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.

SCI.8.3A Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning and experimental and observational testing, so as to encourage critical thinking by the student.

SCI.8.3B Use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature.

SCI.8.3C Identify advantages and limitations of models such as size, scale, properties, and materials.

SCI.8.3D Relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.

SCI.8.4A Use appropriate tools to collect, record, and analyze information.

SCI.8.4B Use preventative safety equipment, including chemical splash goggles, aprons and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.