Use the chart below to find Science A–Z units that best support the Next Generation Science Standards* topics for Middle School Physical Science and several featured resources from those units that provide strong connections. Each Performance Expectation in the chart represents all three dimensions: Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts.

NOTE: Science A–Z resources primarily align with standards in grades K–5. However, the units and resources listed below provide a foundation for satisfying middle school standards.

### MS. Structure and Properties of Matter

<table>
<thead>
<tr>
<th>Performance Expectations</th>
<th>Disciplinary Core Ideas</th>
<th>Science A–Z Units (Featured Resources)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.</td>
<td>PS1.A: Structure and Properties of Matter</td>
<td>5–6 Mixing Matter (Unit Nonfiction Books; Dmitri’s Table FOCUS Book; Curious Marie Curie FOCUS Book; What Is Matter Made Of? Interactive Science Lesson)</td>
</tr>
<tr>
<td></td>
<td>PS1.B: Chemical Reactions</td>
<td>5–6 Mixing Matter (Unit Nonfiction Books; Concrete Quick Reads; Alloys Quick Reads)</td>
</tr>
</tbody>
</table>

### MS. Chemical Reactions

<table>
<thead>
<tr>
<th>Performance Expectations</th>
<th>Disciplinary Core Ideas</th>
<th>Science A–Z Units (Featured Resources)</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>PS1.A: Structure and Properties of Matter</td>
<td>5–6 Mixing Matter (Unit Nonfiction Books; Chemical Changes Investigation Pack)</td>
</tr>
</tbody>
</table>

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### MS. Chemical Reactions (continued)

<table>
<thead>
<tr>
<th>Performance Expectations</th>
<th>Disciplinary Core Ideas</th>
<th>Science A–Z Units (Featured Resources)</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>PS1.B: Chemical Reactions</td>
<td><strong>5–6 Mixing Matter</strong> <em>(Unit Nonfiction Books; Chemical Changes Investigation Pack; Curious Marie Curie FOCUS Book)</em></td>
</tr>
<tr>
<td>MS-PS1-6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.</td>
<td>PS1.B: Chemical Reactions</td>
<td><strong>5–6 Mixing Matter</strong> <em>(Chemical Changes Investigation Pack)</em></td>
</tr>
<tr>
<td></td>
<td>ETS1.B: Developing Possible Solutions</td>
<td>No correlations</td>
</tr>
<tr>
<td></td>
<td>ETS1.C: Optimizing the Design Solution</td>
<td>No correlations</td>
</tr>
</tbody>
</table>

### MS. Forces and Interactions

<table>
<thead>
<tr>
<th>Performance Expectations</th>
<th>Disciplinary Core Ideas</th>
<th>Science A–Z Units (Featured Resources)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-PS2-1. Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects.</td>
<td>PS2.A: Forces and Motion</td>
<td><strong>5–6 Force and Motion</strong> <em>(Unit Nonfiction Books; Soccer FOCUS Book; Motion in Sports Quick Reads)</em></td>
</tr>
<tr>
<td>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.</td>
<td>PS2.A: Forces and Motion</td>
<td><strong>5–6 Force and Motion</strong> <em>(Unit Nonfiction Books; Roller Coasters FOCUS Book; Design Your Own Amusement Park Ride Project-Based Learning Pack; Changing States of Matter Interactive Science Lesson)</em></td>
</tr>
</tbody>
</table>

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## MS. Forces and Interactions (continued)

<table>
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<tr>
<th>Performance Expectations</th>
<th>Disciplinary Core Ideas</th>
<th>Science A–Z Units (Featured Resources)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-PS2-3. Ask questions about data to determine the factors that affect the strength of</td>
<td>PS2.B: Types of</td>
<td>5–6 Electricity and Magnetism (Unit Nonfiction Books; Electromagnets Process Activity)</td>
</tr>
<tr>
<td>electric and magnetic forces.</td>
<td>Interactions</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td>MS-PS2-4. Construct and present arguments using evidence to support the claim that</td>
<td>PS2.B: Types of</td>
<td>5–6 Force and Motion (Unit Nonfiction Books; Gravity in the Solar System FOCUS Book; Rubberband Forces:</td>
</tr>
<tr>
<td>gravitational interactions are attractive and depend on the masses of interacting objects.</td>
<td>Interactions</td>
<td>Energy and Mass Process Activity; Weightless Quick Reads)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS-PS2-5. Conduct an investigation and evaluate the experimental design to provide</td>
<td>PS2.B: Types of</td>
<td>5–6 Electricity and Magnetism (Unit Nonfiction Books; Electromagnets Process Activity; Earth as a</td>
</tr>
<tr>
<td>evidence that fields exist between objects exerting forces on each other even though the</td>
<td>Interactions</td>
<td>Magnet Quick Reads)</td>
</tr>
<tr>
<td>objects are not in contact.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## MS. Energy

<table>
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<tr>
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</tr>
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<tbody>
<tr>
<td>MS-PS3-1. Construct and interpret graphical displays of data to describe the</td>
<td>PS3.A: Definitions of</td>
<td>5–6 Force and Motion (Unit Nonfiction Books; Racecars FOCUS Book)</td>
</tr>
<tr>
<td>relationships of kinetic energy to the mass of an object and to the speed of an object.</td>
<td>Energy</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting</td>
<td>PS3.A: Definitions of</td>
<td>5–6 Force and Motion (Roller Coasters FOCUS Book; Rubberband Forces: Energy and Mass Process Activity)</td>
</tr>
<tr>
<td>at a distance changes, different amounts of potential energy are stored in the system.</td>
<td>Energy</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5–6 Force and Motion (Perpetual Motion: Fact or Fiction? FOCUS Book)</td>
</tr>
<tr>
<td></td>
<td>PS3.C: Relationship</td>
<td>3–4 Machines (Wrecking Ball vs. Strong Wall FOCUS Book)</td>
</tr>
<tr>
<td></td>
<td>Between Energy and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forces</td>
<td></td>
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</tbody>
</table>

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<tr>
<td>MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.</td>
<td>PS3.A: Definitions of Energy</td>
<td>3–4 Heat Energy (Unit Nonfiction Books; Thermal Energy Transfer Interactive Science Lesson)</td>
</tr>
<tr>
<td></td>
<td>PS3.B: Conservation of Energy and Energy Transfer</td>
<td>3–4 Heat Energy (Get Cool, Stay Cool FOCUS Book; Get Warm, Stay Warm FOCUS Book; Thermal Energy Transfer Interactive Science Lesson)</td>
</tr>
<tr>
<td></td>
<td>ETS1.A: Defining and Delimiting an Engineering Problem</td>
<td>5–6 Energy Resources (Solar Cooker Process Activity)</td>
</tr>
<tr>
<td></td>
<td>ETS1.B: Developing Possible Solutions</td>
<td>3–4 Heat Energy (Observe Convection Currents Process Activity; Insulate an Ice Cube Process Activity)</td>
</tr>
<tr>
<td>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.</td>
<td>PS3.A: Definitions of Energy</td>
<td>3–4 Heat Energy (Campfire Science FOCUS Book; The Heat of Kilauea FOCUS Book)</td>
</tr>
<tr>
<td></td>
<td>PS3.B: Conservation of Energy and Energy Transfer</td>
<td>3–4 Heat Energy (Unit Nonfiction Books; Science Friction FOCUS Book)</td>
</tr>
<tr>
<td>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.</td>
<td>PS3.B: Conservation of Energy and Energy Transfer</td>
<td>5–6 Force and Motion (Roller Coasters FOCUS Book; Perpetual Motion: Fact or Fiction? FOCUS Book; Rubberband Forces: Energy and Mass Process Activity)</td>
</tr>
<tr>
<td>Performance Expectations</td>
<td>Disciplinary Core Ideas</td>
<td>Science A–Z Units (Featured Resources)</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------------</td>
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<td>---------------------------------------</td>
</tr>
<tr>
<td>MS-PS4-1. Use mathematical representations to describe a simple model for waves that</td>
<td>PS4.A: Wave Properties</td>
<td>5–6 Light Energy (Unit Nonfiction Books; Radiant Energy Investigation Pack)</td>
</tr>
<tr>
<td>includes how the amplitude of a wave is related to the energy in a wave.</td>
<td></td>
<td>3–4 Sound (Unit Nonfiction Books; Seeing Sound FOCUS Book; Shhh! FOCUS Book; Wave Properties Interactive Science Lesson)</td>
</tr>
<tr>
<td>MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or</td>
<td>PS4.A: Wave Properties</td>
<td>5–6 Light Energy (Unit Nonfiction Books; Properties of Sound Investigation Pack; Shhh! FOCUS Book)</td>
</tr>
<tr>
<td>transmitted through various materials.</td>
<td>PS4.B: Electromagnetic Radiation</td>
<td>5–6 Light Energy (Unit Nonfiction Books; How Light Interacts with Objects Science Diagram; Refraction Process Activity; Explore Shadows Process Activity; Spinning Color Disks Process Activity; Telescopes Quick Reads)</td>
</tr>
<tr>
<td>MS-PS4-3. Integrate qualitative scientific and technical information to support the</td>
<td>PS4.C: Information</td>
<td>5–6 Light Energy (DVDs Quick Reads)</td>
</tr>
<tr>
<td>claim that digitized signals are a more reliable way to encode and transmit information</td>
<td>Technologies and</td>
<td>3–4 Sound (Properties of Sound Investigation Pack; CDs: Sound from Light Quick Reads)</td>
</tr>
<tr>
<td>than analog signals.</td>
<td>Instrumentation</td>
<td></td>
</tr>
</tbody>
</table>