

**Joliet Public Schools District 86**  
**Grade 6 Science Curriculum**

Unit Title	NGSS Standards	Unit Overview
<p><b><u>Chemical Reactions</u></b></p> <p>Trimester 1</p> <p>~ 5 weeks</p>	<ul style="list-style-type: none"> <li>● <b>MS-PS1-2.</b> Analyze and interpret data on the properties of substances before and after substances interact to determine if a chemical reaction has occurred.</li> <li>● <b>MS-PS1-3.</b> Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.</li> <li>● <b>MS-PS1-5.</b> 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.</li> <li>● <b>MS-PS1-6.</b> Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.</li> <li>● <b>MS-ETS1-3.</b> 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.</li> </ul>	<p>This unit organizes performance expectations around helping to expand students' understanding of matter and interactions of matter than can create new substances. Students will be able to explain that during a chemical process, the atoms that make up the original substances are regrouped into different molecules. Students will also be able to demonstrate how some chemical reactions release energy and others store energy.</p>
<p><b><u>Energy, Force, and Motion</u></b></p> <p>Trimester 2</p> <p>~ 6 weeks</p>	<ul style="list-style-type: none"> <li>● <b>MS-PS2-1.</b> Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.</li> <li>● <b>MS-PS2-2.</b> 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.</li> <li>● <b>MS-PS3-1.</b> 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.</li> <li>● <b>MS-PS3-5.</b> 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.</li> <li>● <b>MS-PS4-1.</b> 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.</li> <li>● <b>MS-PS4-2.</b> Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.</li> </ul>	<p>The unit organizes performance expectations around helping students understand how objects interact when in contact. Kinetic energy, also known as motion energy, is proportional to the mass of the moving object and grows with the square of its speed. Students will be able to demonstrate that for any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction.</p>
<p><b><u>Field of Force</u></b></p> <p>Trimester 3</p> <p>~ 6 weeks</p>	<ul style="list-style-type: none"> <li>● <b>MS-PS2-3.</b> Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.</li> <li>● <b>MS-PS2-4.</b> Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.</li> <li>● <b>MS-PS2-5.</b> 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.</li> <li>● <b>MS-PS3-2.</b> 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.</li> <li>● <b>MS-ESS1-1.</b> Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.</li> <li>● <b>MS-ESS1-2.</b> Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.</li> <li>● <b>MS-ESS1-3.</b> Analyze and interpret data to determine scale properties of objects in the solar system.</li> </ul>	<p>This unit is assembled to help students understand the interaction of objects when they are not in physical contact with one another. Students will be able to explain that the solar system, consisting of the sun and a collection of objects, including planets, their moons, and asteroids, are held in orbit around the sun by its gravitational pull on them and this model of the solar system can explain eclipses of the sun and the moon. Students will demonstrate that the Earth's spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun.</p>