

# Mississippi Career and College Readiness Standards for Science (2018)

## 5th Grade Science Pacing Guide

\*Units may take more or less time than suggested. Instructional days for each unit include review and assessment.

2018-2019 Holistic Pacing Map - 5th Grade Science*							
Q1		Q2		Q3		Q4	
Intro: Nature of Science		Unit 4: Astronomy		Unit 7: Mixtures and Solutions		MAAP Review	
<ul style="list-style-type: none"> <li>Science and Engineering Practices</li> </ul>	≈3-5 days	<ul style="list-style-type: none"> <li>E.5.8B.4</li> <li>E.5.8A.1</li> <li>E.5.8A.2</li> <li>E.5.8A.3</li> <li>E.5.8A.4</li> </ul>	≈10 days	<ul style="list-style-type: none"> <li>P.5.5B.1 / P.5.5B.4</li> <li>P.5.5B.2 / P.5.5B.3 / P.5.5C.3</li> </ul>	≈10 days		
Unit 1: Photosynthesis		Unit 5: Earth, Sun, and Moon		Unit 8: Chemical and Physical Changes			
<ul style="list-style-type: none"> <li>L.5.3A.1</li> <li>L.5.3A.2</li> </ul>	≈10 days	<ul style="list-style-type: none"> <li>E.5.8B.1</li> <li>E.5.8B.2</li> <li>E.5.8B.3</li> </ul>	≈10 days	<ul style="list-style-type: none"> <li>P.5.5C.1</li> <li>P.5.5C.2</li> </ul>	≈10 days		
Unit 2: Food Webs		Unit 6: Properties of Matter		Unit 9: Newton's Laws of Motion			
<ul style="list-style-type: none"> <li>L.5.3B.1</li> <li>L.5.3B.2 / L.5.3B.3 / L.5.3B.4</li> </ul>	≈15 days	<ul style="list-style-type: none"> <li>P.5.5A.1</li> <li>P.5.5A.2 / P.5.5A.3</li> <li>P.5.5A.4 / P.5.5A.5</li> </ul>	≈15 days	<ul style="list-style-type: none"> <li>P.5.6.1</li> <li>P.5.6.2 / P.5.6.3</li> <li>P.5.6.4 / P.5.6.5 / P.5.6.6</li> </ul>	≈15 days		
Unit 3: Human Interaction with Earth							
<ul style="list-style-type: none"> <li>E.5.10.1 / E.5.10.2</li> </ul>	≈10 days						

**Mississippi Career and College Readiness Standards for Science (2018)**  
**5th Grade Science Pacing Guide**

FIRST NINE WEEKS		
Intro: Nature of Science		
Performance Objective	Science and Engineering Practices	The Learner Will Be Able To
<p><b>Science and Engineering Practices -</b>  <i>Beyond integration within the standards, these practices must be mastered by students to produce a more scientifically literate citizenry and to develop students that are more excited about STEM topics and careers. The practices describe the behaviors that scientists engage in as they investigate and build models and theories about the natural world. They also describe the key set of engineering practices that engineers use as they design and build models and systems. These practices work together (overlap and interconnect) and are not separated in the study and investigation of science concepts.</i></p>	<ul style="list-style-type: none"> <li>● Ask questions and define problems</li> <li>● Engage in scientific argument from evidence</li> <li>● Obtain, evaluate, and communicate information</li> <li>● Develop and use models</li> <li>● Plan and construct investigations</li> <li>● Construct explanations and design solutions</li> <li>● Analyze and interpret data</li> <li>● Use mathematical and computational thinking</li> </ul>	<ul style="list-style-type: none"> <li>● Demonstrate rules of working safely in a lab</li> <li>● Recognize lab safety symbols and their meaning</li> <li>● Use lab equipment safely and accurately</li> <li>● Accurately measure length, mass, volume, etc. using the metric system</li> <li>● Demonstrate the essential components of the scientific method</li> <li>● Develop and conduct an experiment using the scientific method as a guide</li> <li>● Accurately plot data points on various types of graphs (line graphs, bar graphs, etc.)</li> <li>● Analyze results of graphs to determine results, relationships, correlations, etc.</li> </ul>

**Mississippi Career and College Readiness Standards for Science (2018)**  
**5th Grade Science Pacing Guide**

<b>UNIT 1: Photosynthesis [DCI L.5.3 - Ecology and Interdependence]</b>			
<b>Performance Objective*</b>	<b>Science and Engineering Practices</b>	<b>Essential Vocabulary</b>	<b>The Learner Will Be Able To</b>
<p><b>L.5.3A.1</b> - <i>Research and communicate the basic process of photosynthesis that is used by plants to convert light energy into chemical energy that can be stored and released to fuel an organism's activities</i></p>	<ul style="list-style-type: none"> <li>● Ask questions and define problems</li> <li>● Engage in scientific argument from evidence</li> <li>● Obtain, evaluate, and communicate information</li> </ul>	<ul style="list-style-type: none"> <li>● Atmosphere</li> <li>● Autotrophs</li> <li>● Carbon cycle</li> <li>● Carbon dioxide</li> <li>● Cells</li> <li>● Chemical energy</li> <li>● Chemical reaction</li> <li>● Chlorophyll</li> <li>● Convert</li> <li>● Glucose</li> <li>● Heterotrophs</li> <li>● Light</li> <li>● Molecules</li> <li>● Oxygen</li> <li>● Photosynthesis</li> <li>● Pigments</li> <li>● Solar energy</li> <li>● Stomata</li> <li>● Water</li> </ul>	<ul style="list-style-type: none"> <li>● Draw the process of photosynthesis</li> <li>● Practice growing plants or engage in some other type of agricultural activity to investigate the process of photosynthesis</li> </ul>
<p><b>L.5.3A.2</b> - <i>Analyze environments that do not receive direct sunlight and devise explanations as to how photosynthesis occurs, either naturally or artificially</i></p>	<ul style="list-style-type: none"> <li>● Ask questions and define problems</li> <li>● Plan and construct investigations</li> <li>● Engage in scientific argument from evidence</li> <li>● Obtain, evaluate, and communicate information</li> </ul>		

**Mississippi Career and College Readiness Standards for Science (2018)**  
**5th Grade Science Pacing Guide**

<b>UNIT 2: Food Webs [DCI L.5.3 - Ecology and Interdependence]</b>			
<b>Performance Objective*</b>	<b>Science and Engineering Practices</b>	<b>Essential Vocabulary</b>	<b>The Learner Will Be Able To</b>
<b>L.5.3B.1</b> - <i>Obtain and evaluate scientific information regarding the characteristics of different ecosystems and the organisms they support (e.g., salt and freshwater, deserts, grasslands, forests, rainforests, or polar tundra lands)</i>	<ul style="list-style-type: none"> <li>● Ask questions and define problems</li> <li>● Engage in scientific argument from evidence</li> <li>● Obtain, evaluate, and communicate information</li> </ul>	<ul style="list-style-type: none"> <li>● Carnivores</li> <li>● Consumers</li> <li>● Decomposers</li> <li>● Decomposition</li> <li>● Deserts</li> <li>● Ecosystems</li> <li>● Environments</li> <li>● Food chain</li> <li>● Food webs</li> <li>● Forests</li> <li>● Freshwater</li> <li>● Grasslands</li> <li>● Herbivores</li> <li>● Interdependency</li> <li>● invasive</li> <li>● Omnivores</li> <li>● Polar tundra lands</li> <li>● Population</li> <li>● Primary consumers</li> <li>● Rainforests</li> <li>● Resources</li> <li>● Salt water</li> <li>● Secondary consumers</li> <li>● species</li> <li>● Tertiary consumers</li> </ul>	<ul style="list-style-type: none"> <li>● Diagram the flow of energy through simple food chains and food webs</li> </ul>
<b>L.5.3B.2</b> - <i>Develop and use a food chain model to classify organisms as producers, consumers, or decomposers. Trace the energy flow to explain how each group of organisms obtains energy</i>	<ul style="list-style-type: none"> <li>● Develop and use models</li> </ul>		
<b>L.5.3B.3</b> - <i>Design and interpret models of food webs to justify what effects the removal or the addition of a species (i.e., introduced or invasive) would have on a specific population and/or the ecosystem as a whole</i>	<ul style="list-style-type: none"> <li>● Develop and use models</li> <li>● Plan and construct investigations</li> <li>● Obtain, evaluate, and communicate information</li> </ul>		

**Mississippi Career and College Readiness Standards for Science (2018)**  
**5th Grade Science Pacing Guide**

<p><b>L.5.3B.4</b> - <i>Communicate scientific or technical information that explains human positions in food webs and our potential impacts on these systems</i></p>	<ul style="list-style-type: none"> <li>● Ask questions and define problems</li> <li>● Engage in scientific argument from evidence</li> <li>● Obtain, evaluate, and communicate information</li> </ul>		
<p align="center">*For brevity, consider exploring and/or assessing some objectives in this unit together:</p> <ul style="list-style-type: none"> <li>● L.5.3B.1</li> <li>● L.5.3B.2 / L.5.3B.3 / L.5.3B.4</li> </ul>			

<b>UNIT 3: Human Interaction with Earth [DCI E.5.10 - Earth's Resources]</b>			
<b>Performance Objective*</b>	<b>Science and Engineering Practices</b>	<b>Essential Vocabulary</b>	<b>The Learner Will Be Able To</b>
<p><b>E.5.10.1</b> - <i>Collect and organize scientific ideas that individuals and communities can use to conserve Earth's natural resources and systems (e.g., implementing watershed management practices to conserve water resources, utilizing no-till farming to improve soil fertility, reducing emissions to abate air pollution, or recycling to</i></p>	<ul style="list-style-type: none"> <li>● Ask questions and define problems</li> <li>● Engage in scientific argument from evidence</li> <li>● Obtain, evaluate, and communicate information</li> </ul>	<ul style="list-style-type: none"> <li>● Natural resources</li> <li>● nonrenewable</li> <li>● Recycle</li> <li>● Reduce</li> <li>● Renewable</li> <li>● Reuse</li> </ul>	<ul style="list-style-type: none"> <li>● Design devices that help minimize, eliminate or predict the effects of natural hazards</li> </ul>

**Mississippi Career and College Readiness Standards for Science (2018)**  
**5th Grade Science Pacing Guide**

<i>reduce landfill waste).</i>			
<p><b>E.5.10.2</b> - <i>Design a process for better preparing communities to withstand man-made or natural disasters (e.g., removing oil from water or soil, systems that reduce the impact of floods, structures that resist hurricane forces).</i></p> <p><b>Use an engineering design process</b> to define the problem, design, construct, evaluate, and improve the disaster plan.</p>	<ul style="list-style-type: none"> <li>● Construct explanations and design solutions</li> </ul>	<ul style="list-style-type: none"> <li>● Beneficial</li> <li>● Genetic mutations</li> <li>● Harmful</li> <li>● Neutral</li> <li>● Scientific argument</li> </ul>	
<p>*For brevity, consider exploring and/or assessing some objectives in this unit together:</p> <ul style="list-style-type: none"> <li>● E.5.10.1 / E.5.10.2</li> </ul>			

**Mississippi Career and College Readiness Standards for Science (2018)  
5th Grade Science Pacing Guide**

SECOND NINE WEEKS			
UNIT 4: Astronomy [DCI E.5.8 - Earth and the Universe]			
Performance Objective	Science and Engineering Practices	Essential Vocabulary	The Learner Will Be Able To
<p><b>E.5.8B.4</b> - <i>Obtain information and analyze how our understanding of the solar system has evolved over time (e.g., geocentric model of Aristotle and Ptolemy compared to the heliocentric model of Copernicus and Galileo).</i></p>	<ul style="list-style-type: none"> <li>● Ask questions and define problems</li> <li>● Engage in scientific argument from evidence</li> <li>● Obtain, evaluate, and communicate information</li> </ul>	<ul style="list-style-type: none"> <li>● Aristotle</li> <li>● Copernicus</li> <li>● Galileo</li> <li>● Geocentric</li> <li>● Heliocentric</li> <li>● Ptolemy</li> <li>● Solar system</li> </ul>	<ul style="list-style-type: none"> <li>● Draw a picture of each model of our solar system</li> <li>● Design a 3D replica of the solar system</li> </ul>
<p><b>E.5.8A.1</b> - <i>Develop and use scaled models of Earth's solar system to demonstrate the size, composition (i.e., rock or gas), location, and order of the planets as they orbit the Sun</i></p>	<ul style="list-style-type: none"> <li>● Develop and use models</li> <li>● Use mathematical and computational thinking</li> </ul>	<ul style="list-style-type: none"> <li>● Composition</li> <li>● Orbit</li> <li>● Planets</li> <li>● sun</li> </ul>	
<p><b>E.5.8A.2</b> - <i>Use evidence to argue why the sun appears brighter than other stars.</i></p>	<ul style="list-style-type: none"> <li>● Ask questions and define problems</li> <li>● Engage in scientific argument from evidence</li> <li>● Obtain, evaluate, and communicate</li> </ul>	<ul style="list-style-type: none"> <li>● distance</li> <li>● Magnitude</li> <li>● Stars</li> <li>● sun</li> </ul>	

**Mississippi Career and College Readiness Standards for Science (2018)**  
**5th Grade Science Pacing Guide**

	information		
<b>E.5.8A.3</b> - Describe how constellations appear to move from Earth's perspective throughout the seasons (e.g., Ursa Major, Ursa Minor, and Orion)	<ul style="list-style-type: none"> <li>• Ask questions and define problems</li> <li>• Engage in scientific argument from evidence</li> <li>• Obtain, evaluate, and communicate information</li> </ul>	<ul style="list-style-type: none"> <li>• Astronomy</li> <li>• Constellations</li> <li>• Light year</li> <li>• North star</li> <li>• Orion</li> <li>• revolution</li> <li>• Rotation</li> <li>• Seasons</li> <li>• Ursa major</li> <li>• Ursa minor</li> </ul>	
<b>E.5.8A.4</b> - Construct scientific arguments to support claims about the importance of astronomy in navigation and exploration, including the use of telescopes, compasses, and star charts.	<ul style="list-style-type: none"> <li>• Engage in scientific argument from evidence</li> <li>• Obtain, evaluate, and communicate information</li> </ul>	<ul style="list-style-type: none"> <li>• Compasses</li> <li>• Exploration</li> <li>• Navigation</li> <li>• planetarium</li> <li>• Planispheres</li> <li>• Star charts</li> <li>• Telescopes</li> </ul>	

<b>UNIT 5: Earth, Sun, and Moon [DCI E.5.8 - Earth and the Universe]</b>			
<b>Performance Objective</b>	<b>Science and Engineering Practices</b>	<b>Essential Vocabulary</b>	<b>The Learner Will Be Able To</b>
<b>E.5.8B.1</b> - Analyze and	<ul style="list-style-type: none"> <li>• Ask questions and</li> </ul>		<ul style="list-style-type: none"> <li>• Model and solar and</li> </ul>



**Mississippi Career and College Readiness Standards for Science (2018)**  
**5th Grade Science Pacing Guide**

<p><i>interpret data from observations and research (e.g., from NASA, NOAA, or the USGS) to explain patterns in the location, movement, and appearance of the moon throughout a month and over the course of a year.</i></p>	<p>define problems</p> <ul style="list-style-type: none"> <li>● Obtain, evaluate, and communicate information</li> </ul>	<ul style="list-style-type: none"> <li>● Axis</li> <li>● Orbit</li> </ul>	<p>lunar eclipse</p> <ul style="list-style-type: none"> <li>● Demonstrate how the sun moves (rotation and revolution) in the solar system</li> </ul>
<p><b>E.5.8B.2</b> - <i>Develop and use a model of the Earth-Sun-Moon system to analyze the cyclic patterns of lunar phases, solar and lunar eclipses, and seasons</i></p>	<ul style="list-style-type: none"> <li>● Develop and use models</li> <li>● Analyze and interpret data</li> </ul>	<ul style="list-style-type: none"> <li>● Cyclic patterns</li> <li>● Fall</li> <li>● Lunar eclipse</li> <li>● Lunar phases</li> <li>● Solar eclipse</li> <li>● Spring</li> <li>● Summer</li> <li>● Winter</li> </ul>	
<p><b>E.5.8B.3</b> - <i>Develop and use models to explain the factors (e.g., tilt, revolution, and angle of sunlight) that result in Earth's seasonal changes</i></p>	<ul style="list-style-type: none"> <li>● Develop and use models</li> <li>● Obtain, evaluate, and communicate information</li> </ul>	<ul style="list-style-type: none"> <li>● Angle</li> <li>● Revolution</li> <li>● sunlight</li> <li>● Tilt</li> </ul>	

**Mississippi Career and College Readiness Standards for Science (2018)**  
**5th Grade Science Pacing Guide**

<b>UNIT 6: Properties of Matter [DCI P.5.5 - Organization of Matter and Chemical Interactions]</b>			
<b>Performance Objective*</b>	<b>Science and Engineering Practices</b>	<b>Essential Vocabulary</b>	<b>The Learner Will Be Able To</b>
<b>P.5.5A.1</b> - <i>Obtain and evaluate scientific information to describe basic physical properties of atoms and molecules</i>	<ul style="list-style-type: none"> <li>• Ask questions and define problems</li> <li>• Engage in scientific argument from evidence</li> <li>• Obtain, evaluate, and communicate information</li> </ul>	<ul style="list-style-type: none"> <li>• Atoms</li> <li>• Electrons</li> <li>• Elements</li> <li>• Matter</li> <li>• Molecules</li> <li>• Neutrons</li> <li>• particles</li> <li>• Properties</li> <li>• Protons</li> </ul>	<ul style="list-style-type: none"> <li>• Create a chart (graphic) displaying the classification of materials according to their properties</li> <li>• Calculate the density of objects</li> <li>• Manipulate variables toward desired outcome</li> </ul>
<b>P.5.5A.2</b> - <i>Collect, analyze, and interpret data from measurements of the physical properties of solids, liquids, and gases (e.g., volume, shape, movement, and spacing of particles).</i>	<ul style="list-style-type: none"> <li>• Analyze and interpret data</li> <li>• Use mathematical and computational thinking</li> </ul>	<ul style="list-style-type: none"> <li>• Data</li> <li>• Density</li> <li>• Gases</li> <li>• Length</li> <li>• Liquids</li> <li>• Mass</li> <li>• Measurement</li> <li>• Physical properties</li> <li>• Qualitative</li> <li>• Quantitative</li> <li>• Solids</li> <li>• Volume</li> <li>• weight</li> </ul>	
<b>P.5.5A.3</b> - <i>Analyze matter through observations and</i>	<ul style="list-style-type: none"> <li>• Analyze and interpret data</li> </ul>	<ul style="list-style-type: none"> <li>• Characteristics</li> <li>• Color</li> </ul>	

# Mississippi Career and College Readiness Standards for Science (2018)

## 5th Grade Science Pacing Guide

<p><i>measurements to classify materials (e.g., powders, metals, minerals, or liquids) based on their properties (e.g., color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, solubility, or density).</i></p>	<ul style="list-style-type: none"> <li>● Use mathematical and computational thinking</li> </ul>	<ul style="list-style-type: none"> <li>● Conductivity</li> <li>● density</li> <li>● Hardness</li> <li>● Magnetic forces</li> <li>● Materials</li> <li>● Matter</li> <li>● Metals</li> <li>● Minerals</li> <li>● Plasma</li> <li>● Reflectivity</li> <li>● Solubility</li> <li>● Substance</li> </ul>	
<p><b>P.5.5A.4</b> - <i>Make and test predictions about how the density of an object affects whether the object sinks or floats when placed in a liquid</i></p>	<ul style="list-style-type: none"> <li>● Develop and use models</li> <li>● Plan and construct investigations</li> <li>● Construct explanations (science) and design solutions (engineering)</li> </ul>	<ul style="list-style-type: none"> <li>● Density</li> <li>● Float</li> <li>● liquid</li> <li>● Sink</li> </ul>	
<p><b>P.5.5A.5</b> - <i>Design a vessel that can safely transport a dense substance (e.g., syrup, coins, marbles) through water at various distances and under variable conditions. Use an <b>engineering design process</b> to define the problem, design, construct, evaluate, and improve the vessel.</i></p>	<ul style="list-style-type: none"> <li>● Construct explanations (science) and design solutions (engineering)</li> </ul>	<ul style="list-style-type: none"> <li>● Buoyant</li> <li>● conditions</li> <li>● Force</li> <li>● Transport</li> <li>● Variable</li> </ul>	

# Mississippi Career and College Readiness Standards for Science (2018)

## 5th Grade Science Pacing Guide

\*For brevity, consider exploring and/or assessing some objectives in this unit together:

- P.5.5A.1
- P.5.5A.2 / P.5.5A.3
- P.5.5A.4 / P.5.5A.5

**Mississippi Career and College Readiness Standards for Science (2018)**  
**5th Grade Science Pacing Guide**

THIRD NINE WEEKS			
UNIT 7: Mixtures and Solutions [DCI P.5.5 - Organization of Matter and Chemical Interactions]			
Performance Objective	Science & Engineering Practices	Essential Vocabulary	The Learner Will Be Able To
<p><b>P.5.5B.1</b> - <i>Obtain and evaluate scientific information to describe what happens to the properties of substances in mixtures and solutions</i></p>	<ul style="list-style-type: none"> <li>● Ask questions and define problems</li> <li>● Engage in scientific argument from evidence</li> <li>● Obtain, evaluate, and communicate information</li> </ul>	<ul style="list-style-type: none"> <li>● Concentration</li> <li>● Dilute</li> <li>● Dissolving</li> <li>● Evaporation</li> <li>● Heterogenous</li> <li>● Homogenous</li> <li>● Mixtures</li> <li>● Properties</li> <li>● Saturation</li> <li>● Solute</li> <li>● Solutions</li> <li>● Solvent</li> <li>● Substances</li> <li>● volume</li> </ul>	<ul style="list-style-type: none"> <li>● Observe and write about the physical properties of substances</li> <li>● Make observations and collect data</li> <li>● Communicate effectively with classmates and the teacher about the physical properties of substances and the study of mixtures</li> </ul>
<p><b>P.5.5B.2</b> - <i>Analyze and interpret data to communicate that the concentration of a solution is determined by the relative amount of solute versus solvent in various solutions</i></p>	<ul style="list-style-type: none"> <li>● Analyze and interpret data</li> <li>● Use mathematical and computational thinking</li> </ul>	<ul style="list-style-type: none"> <li>● Concentration</li> <li>● heterogenous</li> <li>● Homogenous</li> <li>● Mixtures</li> <li>● Solute</li> <li>● Solution</li> <li>● Solvent</li> </ul>	
<p><b>P.5.5B.3</b> - <i>Investigate how</i></p>	<ul style="list-style-type: none"> <li>● Plan and construct</li> </ul>	<ul style="list-style-type: none"> <li>● dissolve</li> </ul>	

# Mississippi Career and College Readiness Standards for Science (2018)

## 5th Grade Science Pacing Guide

<p><i>different variables (e.g., temperature change, stirring, particle size, or surface area) affect the rate at which a solute will dissolve</i></p>	<p>investigations</p>	<ul style="list-style-type: none"> <li>● Particle</li> <li>● Rate</li> <li>● Solute</li> <li>● Surface area</li> <li>● Temperature</li> <li>● Variables</li> </ul>	
<p><b>P.5.5B.4</b> - <i>Design an effective system (e.g., sifting, filtration, evaporation, magnetic attraction, or floatation) for separating various mixtures. Use an engineering design process to define the problem, design, construct, evaluate, and improve the system.</i></p>	<ul style="list-style-type: none"> <li>● Develop and use models</li> <li>● Plan and construct investigations</li> <li>● Construct explanations (science) and design solutions (engineering)</li> </ul>	<ul style="list-style-type: none"> <li>● Evaporation</li> <li>● Filtration</li> <li>● Floatation</li> <li>● Magnetic attraction</li> <li>● mixtures</li> <li>● Sifting</li> <li>● System</li> </ul>	
<p><b>P.5.5C.3</b> - <i>Analyze and interpret data to support claims that when two substances are mixed, the total weight of matter is conserved</i></p>	<ul style="list-style-type: none"> <li>● Analyze and interpret data</li> <li>● Use mathematical and computational thinking</li> </ul>	<ul style="list-style-type: none"> <li>● Claims</li> <li>● conserve</li> <li>● Data</li> <li>● Mixed</li> <li>● Substances</li> <li>● Weight</li> </ul>	
<p>*For brevity, consider exploring and/or assessing some objectives in this unit together:</p> <ul style="list-style-type: none"> <li>● P.5.5B.1 / P.5.5B.4</li> <li>● P.5.5B.2 / P.5.5B.3 / P.5.5C.3</li> </ul>			

**Mississippi Career and College Readiness Standards for Science (2018)**  
**5th Grade Science Pacing Guide**

<b>UNIT 8: Chemical and Physical Changes [DCI P.5.5 - Organization of Matter and Chemical Interactions]</b>			
<b>Performance Objective*</b>	<b>Science &amp; Engineering Practices</b>	<b>Essential Vocabulary</b>	<b>The Learner Will Be Able To</b>
<b>P.5.5C.1</b> - <i>Analyze and communicate the results of chemical changes that result in the formation of new materials (e.g., decaying, burning, rusting, or cooking)</i>	<ul style="list-style-type: none"> <li>• Ask questions and define problems</li> <li>• Engage in scientific argument from evidence</li> <li>• Obtain, evaluate, and communicate information</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical change</li> <li>• Formation</li> <li>• Materials</li> <li>• properties</li> <li>• Substance</li> </ul>	<ul style="list-style-type: none"> <li>• Design and conduct an investigation to demonstrate and compare physical and chemical changes</li> <li>• Measure and graph the weights of matter before and after being heated, cooled, or mixed</li> </ul>
<b>P.5.5C.2</b> - <i>Analyze and communicate the results of physical changes to a substance that results in reversible change (e.g., changes in states of matter with the addition or removal of energy, changes in size or shape, or combining/separating mixtures or solutions)</i>	<ul style="list-style-type: none"> <li>• Ask questions and define problems</li> <li>• Engage in scientific argument from evidence</li> <li>• Obtain, evaluate, and communicate information</li> </ul>	<ul style="list-style-type: none"> <li>• Energy</li> <li>• Mixtures</li> <li>• Physical change</li> <li>• Results</li> <li>• Reversible change</li> <li>• Shape</li> <li>• Size</li> <li>• solutions</li> <li>• States of matter</li> <li>• Substance</li> </ul>	

# Mississippi Career and College Readiness Standards for Science (2018)

## 5th Grade Science Pacing Guide

UNIT 9: Newton's Laws of Motion [DCI P.5.6 - Motions, Forces, and Energy]			
Performance Objective	Science and Engineering Practices	Essential Vocabulary	The Learner Will Be Able To
<b>P.5.6.1</b> - <i>Obtain and communicate information describing gravity's effect on an object</i>	<ul style="list-style-type: none"> <li>• Ask questions and define problems</li> <li>• Engage in scientific argument from evidence</li> <li>• Obtain, evaluate, and communicate information</li> </ul>	<ul style="list-style-type: none"> <li>• Force</li> <li>• Galileo</li> <li>• Gravity</li> <li>• Isaac Newton</li> <li>• Law of falling bodies</li> <li>• Mass</li> <li>• Rate</li> <li>• Resistance</li> <li>• Weight</li> </ul>	<ul style="list-style-type: none"> <li>• Design and build an experiment that shows how forces are balanced and unbalanced, and how unbalanced forces cause motion in an object</li> <li>• Conduct investigations using potential energy and kinetic energy</li> <li>• Design an investigation to determine the effect of friction on moving objects</li> </ul>
<b>P.5.6.2</b> - <i>Predict the future motion of various objects based on past observation and measurement of position, direction, and speed</i>	<ul style="list-style-type: none"> <li>• Analyze and interpret data</li> <li>• Use mathematical and computational thinking</li> </ul>	<ul style="list-style-type: none"> <li>• Direction</li> <li>• Force</li> <li>• Location</li> <li>• Measured</li> <li>• Motion</li> <li>• Movement</li> <li>• Observation</li> <li>• Pattern</li> <li>• Position</li> <li>• Repetitive</li> <li>• speed</li> </ul>	
<b>P.5.6.3</b> - <i>Develop and use models to explain how the amount or type of force, both</i>	<ul style="list-style-type: none"> <li>• Develop and use models</li> <li>• Plan and construct</li> </ul>	<ul style="list-style-type: none"> <li>• Contact</li> <li>• Force</li> <li>• Law of inertia</li> </ul>	



**Mississippi Career and College Readiness Standards for Science (2018)**  
**5th Grade Science Pacing Guide**

<p><i>contact and non-contact, affects the motion of an object</i></p>	<p>investigations</p> <ul style="list-style-type: none"> <li>● Construct explanations and design solutions</li> </ul>	<ul style="list-style-type: none"> <li>● Models</li> <li>● Motion</li> <li>● Non-contact</li> </ul>	
<p><b>P.5.6.4</b> - <i>Plan and conduct scientific investigations to test the effects of balanced and unbalanced forces on the speed and/or directions of objects in motion</i></p>	<ul style="list-style-type: none"> <li>● Plan and construct investigations</li> </ul>	<ul style="list-style-type: none"> <li>● Balanced force</li> <li>● Direction</li> <li>● Inertia</li> <li>● Investigation</li> <li>● mass</li> <li>● Motion</li> <li>● Newton’s First Law</li> <li>● Speed</li> <li>● Unbalanced force</li> </ul>	
<p><b>P.5.6.5</b> - <i>Predict how a change of force, mass, and/or friction affects the motion of an object to convert potential energy into kinetic energy</i></p>	<ul style="list-style-type: none"> <li>● Analyze and interpret data</li> <li>● Use mathematical and computational thinking</li> </ul>	<ul style="list-style-type: none"> <li>● Conservation of energy</li> <li>● Convert</li> <li>● energy</li> <li>● Force</li> <li>● Friction</li> <li>● Kinetic energy</li> <li>● Mass</li> <li>● Motion</li> <li>● Potential energy</li> </ul>	
<p><b>P.5.6.6</b> - <i>Design a system to increase the effects of friction on the motion of an object (e.g., non-slip surfaces or vehicle braking systems or flaps on aircraft wings). Use</i></p>	<ul style="list-style-type: none"> <li>● Construct explanations (science) and design solutions (engineering)</li> </ul>	<ul style="list-style-type: none"> <li>● Change</li> <li>● Friction</li> <li>● heat</li> <li>● Increase</li> <li>● Motion</li> <li>● Position</li> </ul>	

**Mississippi Career and College Readiness Standards for Science (2018)**  
**5th Grade Science Pacing Guide**

<i><b>an engineering design process</b> to define the problem, design, construct, evaluate, and improve the system.</i>		<ul style="list-style-type: none"><li>● Surface texture</li></ul>	
<p>*For brevity, consider exploring and/or assessing some objectives in this unit together:</p> <ul style="list-style-type: none"><li>● P.5.6.1</li><li>● P.5.6.2 / P.5.6.3</li><li>● P.5.6.4 / P.5.6.5 / P.5.6.6</li></ul>			

**Mississippi Career and College Readiness Standards for Science (2018)**  
**5th Grade Science Pacing Guide**

**FOURTH NINE WEEKS**

**End-of-Year MAAP Science Review**

- Prepare comprehensive practice exam early to catch deficits in each strand.
  - Make sure students are practicing with a range of question types.
- This is not a time to reteach, but to refresh content via sample questions and review activities.