

7th Grade Science

Natural processes and human activities cause energy to flow and matter to cycle through Earth's systems.

Semester 1				Semester 2			
Quarter 1		Quarter 2		Quarter 3		Quarter 4	
Instructional Segment #1: Organisms and non-living things are made of atoms.		Instructional Segment #2: Matter cycles and energy flows through organisms and rocks.		Instructional Segment #3: Natural processes and human activities have shaped Earth's resources and ecosystems.		Instructional Segment #4: Human activities help sustain biodiversity and ecosystem services in a changing world.	
MS-ESS3-1* ₂ MS-LS2-3* ₅ MS-PS1-1 ³ MS-PS1-3* ₆ MS-PS1-4 ₂	Lab Safety	MS-LS1-6 ₅ MS-LS1-7 ₅ MS-ESS2-1 ₇ MS-PS1-2* ₁ MS-PS1-5* ₅	MS-PS1-6 ₅ MS-ETS1-1* MS-ETS1-2* MS-ETS1-3 MS-ETS1-4	MS-LS2-1 ₆ MS-LS2-2* ₁ MS-LS2-3* ₅ MS-ESS2-3 ₁	MS-ESS3-1* ₂ MS-PS1-2* ₁ MS-PS1-3* ₆ MS-PS1-5* ₅	MS-LS2-4 ₇ MS-LS2-5 ₇ MS-LS2-2* ₁ MS-ESS3-2 ₁	MS-PS1-3* ₆ MS-ETS1-1* MS-ETS1-2*

* = standard is taught more than once within this course

<u>EP&Cs Connections:</u>	<u>ELD Connections:</u>	<u>EP&Cs Connections:</u>	<u>ELD Connections:</u>	<u>EP&Cs Connections:</u>	<u>ELD Connections:</u>	<u>EP&Cs Connections:</u>	<u>ELD Connections:</u>
Principles 1 & 2	ELD.PI.6.1,5,6 a-b, 9,10,11a	Principles 3, 4, 5	ELD.PI.6.1,5,6 a-b, 9,10,11a	Principles 1-5	ELD.PI.6.1,5,6 a-b, 9,10,11a	Principles 1-5	ELD.PI.6.1,5,6 a-b, 9,10,11a
CCSS ELA Connections: RST.6-8.1,7 , WHST.6-8.2,8	CCSS Math Connections: 6.EE.6 , 6.RP.3 , 6.NS.5 , 7.EE.4 , MP.2 , MP.4	CCSS ELA Connections: RST.6-8.1,2,3,7 , WHST.6-8.2,7,8,9 , SL.7.5	CSS Math Connections: 6.EE.9 , MP.2 , MP.4 , 6.SP.4,5 , 7.EE.3 , 7.SP.7	CCSS ELA Connections: RST.6-8.1,2,7,9 , WHST.6-8.1,2,9 , SL.7.1 , 4, 5	CSS Math Connections: 6.EE.6,9 , 6.SP.4,5 , 6.RP.3 , 7.EE.4 , MP.2	CCSS ELA Connections: RI.7.8 , RST.6-8.1,7,8 , WHST.6-8.1,2,9 , SL.7.5	CSS Math Connections: MP.2 , MP.4 , 6.EE.6 , 6.RP.3 , 7.EE.4

Science & Engineering Practices (SEPs)

- 1.) [Asking questions and defining problems](#)
- 2.) [Developing and using models](#)
- 3.) [Planning and carrying out investigations](#)
- 4.) [Analyzing and interpreting data](#)
- 5.) [Using mathematics and computational thinking](#)
- 6.) [Constructing explanations and designing solutions](#)
- 7.) [Engaging in argument from evidence](#)
- 8.) [Obtaining, evaluating and communicating information](#)

Crosscutting Concepts (CCCs)

- 1.) [Patterns](#)
- 2.) [Cause and Effect](#)
- 3.) [Scale, Proportion, Quantity](#)
- 4.) [Systems and System Models](#)
- 5.) [Energy and Matter](#)
- 6.) [Structure and Function](#)
- 7.) [Stability and Change](#)

Guiding Questions:

<p>Instructional Segment #1: Organisms and nonliving things are made of atoms.</p>	<p>Instructional Segment #2: Matter cycles and energy flows through organisms and rocks.</p>	<p>Instructional Segment #3: Natural processes and human activities have shaped Earth's resources and ecosystems.</p>	<p>Instructional Segment #4: Human activities help sustain biodiversity and ecosystem services in a changing world.</p>
<ul style="list-style-type: none"> • How does the matter in living and nonliving things differ? • How does adding or removing thermal energy affect the physical states of matter? • How do interactions at the atomic level help us understand the observable properties of organisms and nonliving matter? 	<ul style="list-style-type: none"> • How do rocks and minerals record the flow of energy and cycling of matter in the Earth? • How do we get energy from our food? • How are hot objects different than cold objects? What changes when they heat up or cool down? 	<ul style="list-style-type: none"> • How can we use interactions between individual rocks or individual organisms to understand systems as big as the whole geosphere or whole ecosystem? • How can we use patterns in geosphere interactions to predict the location of resources? • How can we use patterns in ecosystem interactions to predict how organisms compete and share resources? 	<ul style="list-style-type: none"> • What natural processes and human activities threaten biodiversity and ecosystem services? • How can people help sustain biodiversity and ecosystem services in a changing world?

7th Grade Science- Quarter 1 Overview

Quarter Topic Focus: Organisms and non-living things are made of atoms.

<u>Science & Engineering Practice (SEP)</u>	<u>Disciplinary Core Idea (DCI)</u>	<u>Crosscutting Concept (CCC)</u>	Performance Expectation (PE)
How students will demonstrate their understanding...	What students will understand...	How students will connect their understanding across units and courses... (Why they should know it)	A complete standard (SEP + DCI + CCC = PE) <small>*colors are associated with SEP (see page 1 for key)</small>
<u>Construct a scientific explanation</u> based on evidence	for how the <u>uneven distribution of Earth’s mineral, energy, and groundwater resources</u> are the result of past and current geoscience processes.	(Cause and Effect)	MS-ESS3-1
<u>Develop a model</u> to describe	the cycling of matter and flow of energy among <u>living and nonliving parts of an ecosystem</u> .	(Energy and Matter)	MS-LS2-3
<u>Develop models</u> to describe	<u>the atomic composition of simple molecules and extended structures</u> .	(Scale, Proportion, Quantity)	MS-PS1-1
<u>Gather and make sense of information</u> to describe that	<u>synthetic materials come from natural resources</u> and impact society.	(Structure and Function)	MS-PS1-3
<u>Develop a model</u> that predicts and describes	<u>changes in particle motion, temperature, and state of a pure substance</u> when thermal energy is added or removed.	(Cause and Effect)	MS-PS1-4

7th Grade Science- Quarter 2 Overview

Quarter Topic Focus: Matter cycles and energy flows through organisms and rocks.

<u>Science & Engineering Practice (SEP)</u>	<u>Disciplinary Core Idea (DCI)</u>	<u>Crosscutting Concept (CCC)</u>	<u>Performance Expectation (PE)</u>
How students will demonstrate their understanding...	What students will understand...	How students will connect their understanding across units and courses... (Why they should know it)	A complete standard (SEP + DCI + CCC = PE) <small>*colors are associated with SEP (see page 1 for key)</small>
<u>Construct a scientific explanation</u> based on evidence	for the <u>role of photosynthesis</u> in the	<u>cycling of matter and flow of energy</u> into and out of organisms.	MS-LS1-6
<u>Develop a model</u> to describe how	<u>food is rearranged through chemical reactions</u> forming new molecules that support growth and/or release of	<u>energy as this matter moves</u> through an organism.	MS-LS1-7
<u>Develop a model</u> to describe	the <u>cycling of Earth's materials and flow of energy</u> that drives this process.	(<u>Stability and Change</u>)	MS-ESS2-1
<u>Analyze and interpret data</u> on the properties of	substances before and after the substances interact to <u>determine if a chemical change has happened.</u>	(<u>Patterns</u>)	MS-PS1-2
<u>Develop and use a model</u> to describe	how the <u>total number of atoms does not change</u> in a chemical reaction and thus mass is conserved.	(<u>Energy and Matter</u>)	MS-PS1-5
<u>Undertake a design project to construct,</u>	<u>test, and modify</u> a device that either <u>releases or absorbs thermal energy by chemical processes.</u>	(<u>Energy and Matter</u>)	MS-PS1-6
<u>Define the criteria and constraints</u> of a design problem	with <u>sufficient precision</u> to ensure a successful solution, taking into account relevant scientific principles	and <u>potential impacts on people and the natural environment</u> that may limit possible solutions.	MS-ETS1-1

<p>Evaluate competing design solutions</p>	<p>using a systematic process to determine how well they meet the criteria and constraints of the problem.</p>	<p>n/a</p>	<p>MS-ETS1-2</p>
<p>Analyze data from tests to determine similarities and differences</p>	<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>n/a</p>	<p>MS-ETS1-3</p>
<p>Develop a model to generate data</p>	<p>for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.</p>	<p>n/a</p>	<p>MS-ETS1-4</p>

7th Grade Science- Quarter 3 Overview

Quarter Topic Focus: Natural processes and human activities have shaped Earth's resources and ecosystems.

<u>Science & Engineering Practice (SEP)</u>	<u>Disciplinary Core Idea (DCI)</u>	<u>Crosscutting Concept (CCC)</u>	<u>Performance Expectation (PE)</u>
How students will demonstrate their understanding...	What students will understand...	How students will connect their understanding across units and courses... (Why they should know it)	A complete standard (SEP + DCI + CCC = PE) <small>*colors are associated with SEP (see page 1 for key)</small>
<u>Develop and use a model</u> to describe	the <u>function of a cell</u> as a whole and ways the parts of cells	contribute to the <u>function</u> .	MS-LS2-1
<u>Construct an explanation</u> that predicts	patterns of <u>interactions among organisms across multiple ecosystems</u> .	(Patterns)	MS-LS2-2
<u>Develop a model</u> to describe	the <u>cycling of matter and flow of energy among living and nonliving parts of an ecosystem</u> .	(Energy and Matter)	MS-LS2-3
<u>Analyze and interpret data</u> on the distribution of	fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past <u>plate motions</u> .	(Patterns)	MS-ESS2-3
<u>Construct a scientific explanation</u> based on evidence for how	the <u>uneven distribution of Earth's mineral, energy, and groundwater resources</u> are the	result of past and current geoscience processes. (Cause and Effect)	MS-ESS3-1
<u>Analyze and interpret data</u> on the	<u>properties of substances</u> before and after the substances interact to determine if a <u>chemical reaction</u> has occurred.	(Patterns)	MS-PS1-2
<u>Gather and make sense of information</u> to describe that	<u>synthetic materials come from natural resources</u> and impact society.	(Structure and Function)	MS-PS1-3
<u>Develop and use a model</u> to describe	how the <u>total number of atoms does not change</u> in a chemical reaction and thus mass is conserved.	(Energy and Matter)	MS-PS1-5

7th Grade Science- Quarter 4 Overview

Quarter Topic Focus: Human activities help sustain biodiversity and ecosystem services in a changing world.			
<u>Science & Engineering Practice (SEP)</u>	<u>Disciplinary Core Idea (DCI)</u>	<u>Crosscutting Concept (CCC)</u>	Performance Expectation (PE)
How students will demonstrate their understanding...	What students will understand...	How students will connect their understanding across units and courses... (Why they should know it)	A complete standard (SEP + DCI + CCC = PE) <small>*colors are associated with SEP (see page 1 for key)</small>
<u>Construct an argument</u> supported by empirical evidence that	<u>changes to physical or biological components to an environment affect ecosystems.</u>	(<u>Stability and Change</u>)	MS-LS2-4
<u>Evaluate competing design solutions</u> for	<u>maintaining biodiversity and ecosystem services.</u>	(<u>Stability and Change</u>)	MS-LS2-5
<u>Construct an explanation</u> that predicts	patterns of <u>interactions among organisms across multiple ecosystems.</u>	(<u>Patterns</u>)	MS-LS2-2
<u>Analyze and interpret data</u> on	<u>natural hazards</u> to forecast future catastrophic events and inform the development of technologies to	mitigate their effects. (<u>Patterns</u>)	MS-ESS3-2
<u>Gather and make sense of information</u> to describe that	<u>synthetic materials come from natural resources</u> and impact society.	(<u>Structure and Function</u>)	MS-PS1-3
<u>Define the criteria and constraints</u> of a design problem	with <u>sufficient precision</u> to ensure a successful solution, taking into account relevant scientific principles and potential impacts on	<u>people and the natural environment</u> that may limit possible solutions.	MS-ETS1-1
<u>Evaluate competing design solutions</u>	using a <u>systematic process to determine</u> how well they meet the criteria and constraints of the problem.	n/a	MS-ETS1-2