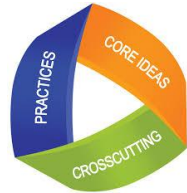


Grade 7 Science							
Grade Level Overview	Seventh grade is a year long study of the crosscutting concepts of systems and system models. Students model and explain the interactions of living and nonliving systems in the environment and use the idea of systems and system models to design artificial body parts.						
Disciplinary Core Ideas		Science and Engineering Principles		Crosscutting Concepts			
Physical Science	Chemistry of Materials	Asking questions (for science) and defining problems (for engineering)		Patterns			
	Chemical Reactions	Developing and using models		Cause and effect			
Life Science	Ecology	Planning and carrying out investigations		Scale, proportion, and quantity			
		Analyzing and interpreting data		Systems and system models			
		Using mathematics and computational thinking		Energy and matter			
Earth and Space Science	Geological Processes	Constructing explanations and designing solutions		Structure and function			
	Earth's Resources	Engaging in argument from evidence		Stability and change			
Engineering, Technology, & Applications of Science	Biomedical Engineering	Obtaining, evaluating, and communicating information					
	Chemical Reactions						
Unit: Chemistry of Materials							
Essential Question	Performance Expectations		CCSS ELA		CCSS Math		
What are the environmental impacts of producing, using, and disposing of materials?	<i>Students who demonstrate understanding can:</i>		Reading in Science and Technical Subjects	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.	Mathematical Practice	Reason abstractly and quantitatively.	
	MS-PS1-1: Develop models to describe the atomic composition of simple molecules and extended structures.			Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).	Ratios and Proportional Reasoning	7.RP.A. Recognize and represent proportional relationships between quantities.	
	MS-PS1-3: Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.			Follow precisely a multi-step procedure when carrying out experiments, taking measurements, or performing technical tasks.			
	MS-PS1-4: Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.		Writing in History/Social Studies, Science, and Technological Subjects	Write arguments focused on discipline-specific content.			
				Draw evidence from informational texts to support analysis, reflection, and research.			
Unit: Chemical Reactions							
Essential Question	Performance Expectations		CCSS ELA		CCSS Math		
How do people use chemical reactions to solve problems?	<i>Students who demonstrate understanding can:</i>		Reading in Science and Technical Subjects	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.	Mathematical Practice	Reason abstractly and quantitatively.	
	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.			Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).			
	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.			Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.			
	MS-PS1-6: Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.		Follow precisely a multi-step procedure when carrying out experiments, taking measurements, or performing technical tasks.				
			Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.				
	MS-ETS1-3: 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.		Write arguments focused on discipline-specific content.				
	MS-ETS1-4: Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.		Writing in History/Social Studies, Science, and Technological Subjects	Draw evidence from informational texts to support analysis, reflection, and research.			
		Speaking and listening	Engage effectively in a range of collaborative discussions.				
Unit: Ecology							
Essential Question	Performance Expectations		CCSS ELA		CCSS Math		
How and why do organisms interact with their environment and what are the effects of these interactions?	<i>Students who demonstrate understanding can:</i>		Reading in Science and Technical Subjects	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.	Mathematical Practice	Reason abstractly and quantitatively.	
	MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.			Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.		Model with mathematics.	
	MS-LS2-2: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.			Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).	Ratios and Proportional Reasoning	6.RP.A.1 Understand the concept of a ratio, and use ratio language to describe a ratio between two quantities.	
	MS-LS2-3: Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.		Follow precisely a multi-step procedure when carrying out experiments, taking measurements, or performing technical tasks.	6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems.			
	MS-LS2-4: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.		Writing in History/Social Studies, Science, and Technological Subjects	Write arguments focused on discipline-specific content.	Expressions and Equations	6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.	
	MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services.			Draw evidence from informational texts to support analysis, reflection, and research.		6.SP.B.5 Summarize numerical data sets in relation to their context.	
				Write informative/explanatory texts to examine and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.			
			Speaking and listening	Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound and valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.			
			Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.				
Unit: Geological Processes							
Essential Question	Performance Expectations		CCSS ELA		CCSS Math		
	<i>Students who demonstrate understanding can:</i>			Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).	Mathematical Practice	Reason abstractly and quantitatively.	
	MS-ESS2-1: Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.			Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.		Model with mathematics.	

Where should we store our nuclear waste?	MS-ESS2-2: Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	Reading in Science and Technical Subjects	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.	The Number System	6NSC.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/ below sea level, credits/debits, positive/negative electrical charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of zero in each situation. 6RPA.1 Understand the concept of a ratio, and use ratio language to describe a ratio between two quantities. 7RP.A.1 Recognize and represent proportional relationships between quantities.
	MS-ESS2-3: Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.		Follow precisely a multi-step procedure when carrying out experiments, taking measurements, or performing technical tasks.		
	MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.	Writing in History/Social Studies, Science, and Technological Subjects	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.	Ratios and Proportional Reasoning	
	MS-ESS3-2: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.		Write informative/explanatory texts to examine and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. Write arguments focused on discipline-specific content. Draw evidence from informational texts to support analysis, reflection, and research.		
		Speaking and listening	Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound and valid reasoning, and well-chosen details: use appropriate eye contact, adequate volume, and clear pronunciation. Engage effectively in a range of collaborative discussions.		
Unit: Earth's Resources					
Essential Question	Performance Expectations		CCSS ELA		CCSS Math
How is a growing human population affecting the availability of natural resources?	Students who demonstrate understanding can:		Follow precisely a multi-step procedure when carrying out experiments, taking measurements, or performing technical tasks.	Mathematical Practice	Reason abstractly and quantitatively. Model with mathematics.
	MS-ESS1-4: Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.	Reading in Science and Technical Subjects	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.	Ratios and Proportional Reasoning	7RP.A.1 Recognize and represent proportional relationships between quantities.
	MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.		Write informative/explanatory texts to examine and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.	Statistics and Probability	6SP.B.5 Summarize numerical data sets in relation to their context.
	MS-ESS3-4: Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	Writing in History/Social Studies, Science, and Technological Subjects	Write arguments focused on discipline-specific content. Draw evidence from informational texts to support analysis, reflection, and research.		
Unit: Biomedical Engineering					
Essential Question	Performance Expectations		CCSS ELA		CCSS Math
How can engineering be used to improve the lives of those living with medical conditions?	Students who demonstrate understanding can:		Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.	Mathematical Practice	Reason abstractly and quantitatively. Model with mathematics.
	MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.		Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.		7EE.B.3 Solve multi-step, real-world and mathematical problems posed with positive and negative numbers in any form, using tools strategically.
	MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	Reading in Science and Technical Subjects	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.	Expressions and Equations	Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; assess the reasonableness of answers using mental computation and estimation strategies.
	MS-ETS1-3: 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.		Write informative/explanatory texts to examine and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.	Ratios and Proportional Reasoning	6RP.A.1 Understand the concept of a ratio, and use ratio language to describe a ratio between two quantities. 6RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems.
	MS-ETS1-4: Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	Writing in History/Social Studies, Science, and Technological Subjects	Draw evidence from informational texts to support analysis, reflection, and research.		
		Speaking and listening	Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound and valid reasoning, and well-chosen details: use appropriate eye contact, adequate volume, and clear pronunciation.		
Social and Emotional Standards			ISTE Standards		
Self-Awareness and Self-Management	SEL.7.1B.2 Recognize the outside influences on development of personal characteristics (examples include body image, self-esteem, behavior).	Empowered Learner	Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences.		
	SEL.7.1C.1 Identify resources to help progress toward a goal (examples include research materials).	Creative Communicator	Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.		
	SEL.7.1C.3 Analyze how you might have made better use of supports and overcome obstacles in working on a recent goal.	Computational Thinker	Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.		
	SEL.7.1C.4 Distinguish between a short and long-term goal.				
Social-Awareness and Relationship Skills	SEL.7.1C.5 Apply goal-setting skills to develop academic success.				
	SEL.7.2A.2 Recall a situation where your behavior impacted the feelings of others either positively or negatively.	Knowledge Constructor	Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.		
	SEL.7.2B.2 Identify negative depictions of differences among people (examples include gender or sexual orientation stereotyping, discrimination against socioeconomic or culture minorities, prejudices based on misinformation in readings completed for coursework).				
	SEL.7.2B.3 Explain how a lack of understanding of social and cultural differences can contribute to intolerance.	Digital Citizen	Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.		
	SEL.7.2B.4 Evaluate ways of overcoming a lack of understanding of those who are different.				
Responsible Decision-Making	SEL.7.2B.6 Listen respectfully to opposing points of views on controversial issues.	Global Collaborator	Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.		
	SEL.7.2C.5 Demonstrate an ability to both assume leadership and be a team player in achieving group goals.				
	SEL.7.3A.6 Judge the seriousness of unethical behaviors (examples include cheating, lying, stealing, plagiarism, etc).	Innovative Designer	Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.		
	SEL.7.3C.2 Identify responsibilities of citizenship (examples include obeying laws, serving on juries, being informed about issues, being involved in influencing public policy).				