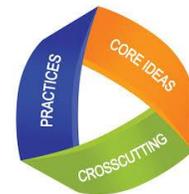


Grade 6 Science

Grade Level Overview Sixth Grade is a year-long study of the crosscutting concept, energy and matter. Students investigate the types and transfer of energy in a variety of systems, from living things to earth processes, including climate and weather systems.

NGSS 3 Dimensions		
Disciplinary Core Ideas	Science and Engineering Principles	Crosscutting Concepts
Physical Science	Energy	Asking questions (for science) and defining problems (for engineering)
		Developing and using models
Life Science	Body Systems From Cells to Organisms	Planning and carrying out investigations
		Analyzing and interpreting data
		Using mathematics and computational thinking
		Constructing explanations and designing solutions
Earth and Space Science	Weather and Climate Land Water and Human Interaction	Engaging in argument from evidence
		Obtaining, evaluating, and communicating information
Engineering, Technology, & Applications of Science	Energy Weather and Climate Land Water and Human Interaction	Patterns
		Cause and effect
		Scale, proportion, and quantity
		Systems and system models
		Energy and matter
		Structure and function
		Stability and change



Unit: Energy

Essential Question	Performance Expectations	CCSS ELA	CCSS Math
How can people manipulate energy transfer and transformation to use energy more efficiently?	<i>Students who demonstrate understanding can:</i>	Reading in Science and Technical Subjects	Mathematical Practice Reason abstractly and quantitatively.
	MS-PS3-3: Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.		
	MS-PS3-4: Plan an investigation to determine the relationship 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.	Writing in History/Social Studies, Science, and Technological Subjects	Expressions and Equations 6EE.A.1 Write, read, and evaluate expressions in which letters stand for numbers. 6EE.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-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.		
MS-ETS1-4: Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs.	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.	

Unit: Body Systems

Essential Question	Performance Expectations	CCSS ELA	CCSS Math
How do we know if a medicine is safe and effective?	<i>Students who demonstrate understanding can:</i>	Reading in Science and Technical Subjects	Mathematical Practice Reason abstractly and quantitatively.
	MS-LS1-3: Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.		
	MS-LS1-8: Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	Writing in History/Social Studies, Science, and Technological Subjects	Statistics and Probability 6.SP.8.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
	MS-LS1-7: Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.		
	Speaking and listening	Engage effectively in a range of collaborative discussions.	

Unit: From Cells to Organisms

Essential Question	Performance Expectations	CCSS ELA	CCSS Math
How should we prevent the spread of an infectious disease?	<i>Students who demonstrate understanding can:</i>	Reading in Science and Technical Subjects	Mathematical Practice Reason abstractly and quantitatively.
	MS-LS1-1: Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.		
	MS-LS1-6: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	Writing in History/Social Studies, Science, and Technological Subjects	Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.
	MS-LS1-7: Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.		

Unit: Weather and Climate

Essential Question	Performance Expectations	CCSS ELA	CCSS Math
	<i>Students who demonstrate understanding can:</i>	Reading in Science and Technical Subjects	Mathematical Practice Reason abstractly and quantitatively. Model with mathematics.
	MS-ESS2-5: Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.		

How does the weather affect people and how do people affect the climate?	MS-ESS2-6: Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.	Writing in History/Social Studies, Science, and Technological Subjects	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
	MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.		Write arguments focused on discipline-specific content.
	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.	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.
	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.		Engage effectively in a range of collaborative discussions.

Unit: Land Water and Human Interaction

Essential Question	Performance Expectations	CCSS ELA		CCSS Math	
Which areas of Boontown are the best choice for construction?	<i>Students who demonstrate understanding can:</i>	Reading in Science and Technical Subjects	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.
	MS-ESS2-2: Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.		Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.		Model with mathematics.
	MS-ESS2-4: Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.		Follow precisely a multi-step procedure when carrying out experiments, taking measurements, or performing technical tasks.	Ratios and Proportional Reasoning	6RP.A.1 Understand the concept of a ratio, and use ratio language to describe a ratio between two quantities.
	MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	Writing in History/Social Studies, Science, and Technological Subjects	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.	Statistics and Probability	6SP.B.5 Summarize numerical data sets in relation to their context.
	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.		Write informative/explanatory texts to examine and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.		
	MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	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.6.1A.4 Describe strategies for dealing with upsetting situations (examples include disappointment, loss, separation).	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.6.1A.6 Use I statements to describe how you feel, why you feel that way, and what you might like to change.	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.6.1B.2 Identify personal strengths and weaknesses and the effect they have on your choices.	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.6.1B.4 Make a plan with action steps and timeframes to achieve your goal.		
Social-Awareness and Relationship Skills	SEL.6.1B.6 Evaluate your success and analyze what you might have done differently.	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.6.2A.1 Identify and practice reflective listening skills through discussion and role-play.		
	SEL.6.2A.6 Predict how one's own behavior might affect the feelings of others.		
	SEL.6.2A.7 Interpret non-verbal communication cues.	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.6.2B.2 Identify ways to overcome misunderstanding among various social and cultural groups.	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.6.2B.6 Demonstrate respect for members of various ethnic and religious groups.	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.6.2C.1 Recognize the difference between positive and negative relationships.			
SEL.6.2D.4 Analyze different approaches to dealing with conflict (examples include avoidance, compliance, negotiation).			
SEL.6.2D.7 Use verbal and non-verbal strategies to resolve group conflict.			
Responsible Decision-Making	SEL.6.3A.1 Recognize that an individual is responsible for his/her behavior.		
	SEL.6.3A.4 Analyze the needs of others in planning how work or sharing goods should be divided (examples include those with handicaps, those who are disadvantaged, and those with special abilities).		