

**MOSCOW SCHOOL DISTRICT**  
**CURRICULUM GUIDE**  
**Subject/Course: Science**  
**Grade 6**

**Students are expected to know content and apply skills from previous grades.**

**Standard 1: Nature of Science**

Students gather evidence to differentiate between predictions, observations, and inferences. Students read, give, and execute technical instructions.

<i>Goal – The student will:</i>	<i>Objectives (to be reached by the end of sixth grade)</i>	<i>Samples of Applications</i>	<i>Curriculum Materials (including technological resources)</i>	<i>Key Vocabulary for Standard 1</i>
<b>Goal 1.1: Understand Systems, Order, and Organization</b>	<ul style="list-style-type: none"> <li>6.S.1.1.1 Analyze different systems. (618.01.a)</li> </ul>	<ul style="list-style-type: none"> <li>Read about a system of the body and teach other team members about it.</li> <li>Describe how marine life interacts with the ecosystem</li> <li>Discuss sphere connections within and between spheres. (McCall Outdoor Science School or MOSS)</li> </ul>	<ul style="list-style-type: none"> <li>Code Blue; Oil Spill;</li> <li>Science Saurus books can be used as a supplementary material in many areas</li> <li>Models and Designs (FOSS);</li> <li>Solar Energy (FOSS); Code Blue</li> </ul>	<ul style="list-style-type: none"> <li>cells</li> <li>concepts</li> <li>conclusion</li> <li>controls</li> <li>critical thinking</li> <li>data</li> <li>evaluate</li> <li>evidence</li> <li>function</li> <li>hypothesis</li> <li>inference</li> <li>investigation</li> <li>metric measurements</li> <li>models</li> <li>observation</li> <li>organ systems</li> <li>organism</li> <li>organs</li> <li>predications</li> <li>scientific explanations</li> <li>scientific procedures</li> <li>stable</li> <li>system</li> <li>technical instructions</li> <li>techniques</li> <li>tissues</li> <li>tools</li> <li>variables</li> <li>dependent variable</li> <li>independent variable</li> </ul>
<b>Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanations</b>	<ul style="list-style-type: none"> <li>6.S.1.2.1 Explain how observations and data are used as evidence on which to base scientific explanations and predictions. (618.02.a)</li> <li>6.S.1.2.2 Use observations to make inferences. (618.02.b)</li> <li>6.S.1.2.3 Use models to explain or demonstrate a concept. (618.02.c)</li> </ul>	<ul style="list-style-type: none"> <li>Make observations and predictions using the “Brown Bag Mystery” activity.</li> <li>Make observations about a ‘black box’ and make inferences about the results you observe.</li> <li>Use data collected in solar energy experiments to make inferences.</li> <li>Create a model of a system of the body to explain the function of the system.</li> </ul>		
<b>Goal 1.3: Understand Constancy, Change, and Measurement</b>	<ul style="list-style-type: none"> <li>6.S.1.3.1 Analyze changes that occur in and among systems. (618.03.b)</li> <li>6.S.1.3.2 Measure in both U.S. Customary and International System of Measurement</li> </ul>	<ul style="list-style-type: none"> <li>Explore how the Earth’s movement relative to the Sun causes shadows to move throughout the day.</li> <li>Use compasses, thermometers, timers</li> </ul>		

	(metric system) units with an emphasis on the metric system. (618.03.c)	to gather data about how orientation affects heat transfer. <ul style="list-style-type: none"> <li>Use rulers to measure distance and/or length accurately in both customary and metric units with the Models and Design go-carts.</li> </ul>		
<b>Goal 1.4: Understand the Theory that Evolution is a Process that Relates to the Gradual Changes in the Universe and of Equilibrium as a Physical State - No objectives at this grade level.</b>				
<b>Goal 1.5: Understand Concepts of Form and Function</b>	<ul style="list-style-type: none"> <li>6.S.1.5.1 Analyze how the shape or form of an object or system is frequently related to its use and/or function. (618.05.a)</li> </ul>	<ul style="list-style-type: none"> <li>Compare and contrast different types of cells, describing how the form relates to its functions (nerve cell, muscle cell, blood cell, etc.)</li> <li>Look at the form of different types of sea life and how it is adapted to its function or way of life.</li> </ul>		
<b>Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills</b>	<ul style="list-style-type: none"> <li>6.S.1.6.1 Write and analyze questions that can be answered by conducting scientific experiments. (619.02.a)</li> <li>6.S.1.6.2 Conduct scientific investigations using a control and variables. Repeat same experiment using alternate variables. (619.02.b)</li> <li>6.S.1.6.3 Select and use appropriate tools and techniques to gather and display data. (619.02.c)</li> <li>6.S.1.6.4 Use evidence to analyze data in order to develop descriptions, explanations, predictions, and models. (619.2.d)</li> <li>6.S.1.6.5 Test a hypothesis based on observations. (619.02.e)</li> <li>6.S.1.6.6 Communicate scientific procedures and explanations. (619.02.g)</li> </ul>	<ul style="list-style-type: none"> <li>Carry out a variety of experiments and collect, analyze and share data using graphs.</li> <li>Create an experiment to test a hypothesis using a cardboard solar house.</li> <li>Create a display board to share suggestions and conclusions about a 'patient' in Code Blue; using data gathered from a variety of sources, share suggestions and conclusions for a new oil terminal in a US port in Oil Spill.</li> </ul>		
<b>Goal 1.7: Understand</b>	No objectives at this grade level.	<ul style="list-style-type: none"> <li>Work successfully in a clinic or port team</li> </ul>		

<b>That Interpersonal Relationships Are Important in Scientific Endeavors</b>		(Code Blue, Oil Spill) to share information; work successfully in a team (Solar Energy, Models and Designs) to conduct experiments and carry out tasks.		
<b>Goal 1.8: Understand Technical Communication</b>	<ul style="list-style-type: none"> <li>6.S.1.8.1 Read, give, and execute technical instructions. (628.01a)</li> </ul>	<ul style="list-style-type: none"> <li>Follow the steps to conduct a variety of experiments with shadows, orientation and heat transfer.</li> </ul>		

### **Standard 2: Physical Science**

Students compare and contrast elements, compounds and mixtures. Students explore the effects of force and energy on objects.

<i>Goal – The student will:</i>	<i>Objectives (to be reached by the end of sixth grade)</i>	<i>Samples of Applications</i>	<i>Curriculum Materials (including technological resources)</i>	<i>Key Vocabulary for Standard 2</i>
<b>Goal 2.1: Understand the Structure and Function of Matter and Molecules and Their Interactions</b>	<ul style="list-style-type: none"> <li>6.S.2.1.1 Compare and contrast the differences among elements, compounds and mixtures. (620.01.a)</li> <li>6.S.2.1.2 Define the properties of matter. (620.01.b)</li> <li>6.S.2.1.3 Compare densities of equal volumes of a solid, a liquid, or a gas. (619.01.c)</li> <li>6.S.2.1.4 Describe the effect of temperature on density. (620.01.c)</li> <li>6.S.2.1.5 Explain the nature of physical change and how it relates to physical properties (the distance between molecules as water changes from ice to liquid water, and to water vapor). (620.01.d)</li> </ul>	<p><b>(This is targeted in the fifth grade. The following ideas will help develop and reinforce these concepts at sixth grade level.)</b></p> <ul style="list-style-type: none"> <li>Explore how warm/hot water or air moves above cool/cold water or air.</li> <li>Use the element names and compound formulas to refer to common substances, such as salt (NaCl), water (H<sub>2</sub>O)</li> <li>Explore how the density of sand, oil and water affects how much of a material a paper cup ‘ship’ can carry.</li> <li>Draw three circles on a paper representing solids, liquids, and gases and place M&amp;Ms in the circle to represent the molecules in the three phases of matter.</li> </ul>	<ul style="list-style-type: none"> <li>Oil Spill; Solar Energy (FOSS)</li> <li>Models and Design (FOSS)</li> </ul>	<ul style="list-style-type: none"> <li>compare</li> <li>compound</li> <li>contrast</li> <li>density</li> <li>element</li> <li>forces</li> <li>friction</li> <li>gas</li> <li>gravity</li> <li>liquid</li> <li>matter</li> <li>mixture</li> <li>molecules</li> <li>physical change</li> <li>physical properties</li> <li>property</li> <li>solid</li> <li>water vapor</li> </ul>

<b>Goal 2.2: Understand Concepts of Motion and Forces</b>	<ul style="list-style-type: none"> <li>6.S.2.2.1 Describe the effects of different forces (gravity and friction) on the movement, speed, and direction of an object. (620.03.d)</li> </ul>	<ul style="list-style-type: none"> <li>Using a variety of inclined planes and surfaces, determine the speed of several objects and graph the results.</li> <li>Test go-carts in a variety of ways, and describe results using words and graphs.</li> </ul>		
<b>Goal 2.3: Understand the Total Energy in the Universe is Constant</b> No objectives at this grade level.				
<b>Goal 2.4: Understand the Structure of Atoms</b> - No objectives at this grade level.				
<b>Goal 2.5: Understand Chemical Reactions</b> - No objectives at this grade level.				

**Standard 3: Biology**

Students understand the building blocks of organisms.

<i>Goal – The student will:</i>	<i>Objectives (to be reached by the end of sixth grade)</i>	<i>Samples of Applications</i>	<i>Curriculum Materials (including technological resources)</i>	<i>Key Vocabulary for Standard 3</i>
<b>Goal 3.1: Understand the Theory of Biological Evolution</b> - No objectives at this grade level.		<ul style="list-style-type: none"> <li>Create a model and a diagram of one of the systems of the body.</li> <li>Watch the video “The Magic of Cells” and complete a handout about the main structures of a cell.</li> <li>Look at various types of cells under a microscope.</li> <li>Draw a diagram or model of a plant cell and an animal, highlighting the different structures.</li> <li>Create a Venn diagram that shows similarities and differences in plant and animal cells.</li> <li>Identify inherited traits such as rolling tongue and attached earlobe.</li> <li>Create a graph of eye color data from family members.</li> <li>Use a Punnett Square to determine the traits of the offspring of two parents; identify</li> </ul>	<ul style="list-style-type: none"> <li>Code Blue and supplementary materials</li> </ul>	<ul style="list-style-type: none"> <li>abundance</li> <li>atoms</li> <li>biosphere</li> <li>carnivores</li> <li>cells</li> <li>chemical reactions</li> <li>components</li> <li>cycle</li> <li>decomposers</li> <li>distribution</li> <li>dominant traits</li> <li>ecosystems</li> <li>energy</li> <li>energy flow</li> <li>function</li> <li>herbivores</li> <li>inheritance</li> <li>limits to resources</li> <li>living</li> <li>molecules</li> <li>natural selection</li> <li>nonliving</li> <li>organ systems</li> <li>organisms</li> <li>photosynthesis</li> <li>recessive</li> </ul>

		recessive and dominant genes.		<ul style="list-style-type: none"> <li>traits</li> <li>relationships</li> <li>resources</li> <li>species</li> <li>tissues organs</li> </ul>
<b>Goal 3.2: Understand the Relationship between Matter and Energy in Living Systems - No objectives at this grade level.</b>				
<b>Goal 3.3: Understand the Cell is the Basis of Form and Function for All Living Things</b>	<ul style="list-style-type: none"> <li>6.S.3.3.1 Identify the different structural levels of which an organism is comprised (cells, tissues, organs, organ systems, and organisms). (621.01.a)</li> <li>6.S.3.3.2 Analyze the structural differences between plant and animal cells. (621.01.b)</li> <li>6.S.3.3.3 Describe how traits are passed from parents to offspring. (621.01.c)</li> </ul>			

#### **Standard 4: Earth and Space Systems**

Students understand and explain the relationship among the systems on Earth, such as solid earth, oceans, atmosphere, and organisms.

<i>Goal – The student will:</i>	<i>Objectives (to be reached by the end of sixth grade)</i>	<i>Samples of Applications</i>	<i>Curriculum Materials (including technological resources)</i>	<i>Key Vocabulary for Standard 4</i>
<b>Goal 4.1: Understand Scientific Theories of Origin and Subsequent Changes in the Universe and Earth Systems</b>	<ul style="list-style-type: none"> <li>6.S.4.1.1 Explain the interactions among the solid earth, oceans, atmosphere, and organisms. (624.01.a)</li> <li>6.S.4.1.2 Explain the water cycle and its relationship to weather and climate. (624.01.b)</li> <li>6.S.4.1.3 Identify cumulus, cirrus, and stratus clouds and how they relate to weather changes. (624.01.c)</li> </ul>	<ul style="list-style-type: none"> <li>Create a poster to describe interactions within the different spheres (hydrosphere, atmosphere, biosphere, lithosphere). (McCall Outdoor Science School or MOSS)</li> <li>Using an experiment with colored water (heated and frozen), explore how temperature differentials can create currents and how this effects global climate.</li> <li>Observe, describe and graph cloud cover at different times of the day. Compare and contrast with the day's temperature.</li> </ul>	<ul style="list-style-type: none"> <li>Oil Spill</li> </ul>	<ul style="list-style-type: none"> <li>atmosphere</li> <li>cirrus cloud</li> <li>climate</li> <li>cumulus cloud</li> <li>organism</li> <li>stratus cloud</li> <li>water cycle</li> </ul>
<b>Goal 4.2: Understand Geo-chemical Cycles and Energy in the Earth System</b> No objectives at this grade level.				

**Standard 5: Personal and Social Perspectives; Technology**

Students identify issues for environmental studies and understand the difference between renewable and nonrenewable resources.

<i>Goal – The student will:</i>	<i>Objectives (to be reached by the end of sixth grade)</i>	<i>Samples of Applications</i>	<i>Curriculum Materials (including technological resources)</i>	<i>Key Vocabulary for Standard 5</i>
<b>Goal 5.1: Understand Common Environmental Quality Issues, Both Natural and Human Induced</b>	<ul style="list-style-type: none"> <li>6.S.5.1.1 Identify issues for environmental studies. (626.01.a)</li> </ul>	<ul style="list-style-type: none"> <li>Watch a video about the Exxon Valdez oil spill and its environmental impact</li> <li>Predict and present a plan for dealing with an oil spill in another US port.</li> <li>Take a field trip to the local sewage treatment center or water treatment plant, WSU composting facility, or Moscow recycling center.</li> </ul>	<ul style="list-style-type: none"> <li>Oil Spill</li> <li>Solar Energy, Models and Design (FOSS)</li> <li>Science Saurus</li> <li>Newspapers</li> </ul>	<ul style="list-style-type: none"> <li>alternative energy</li> <li>technology</li> </ul>
<b>Goal 5.2: Understand the Relationship between Science and Technology</b>	<ul style="list-style-type: none"> <li>6.S.5.2.1 Describe how science and technology are part of our society. (625.01.a)</li> <li>6.S.5.2.2 Describe how science and technology are interrelated. (625.01.b)</li> </ul>	<ul style="list-style-type: none"> <li>Explore solar energy solutions to today’s energy issues</li> <li>Incorporate current events and scientists in the news in class discussions.</li> </ul>		
<b>Goal 5.3: Understand the Importance of Natural Resources and the Need to Manage and Conserve Them</b>	<ul style="list-style-type: none"> <li>6.S.5.3.1 Explain the difference between renewable and nonrenewable resources. (626.03.a)</li> </ul>	<ul style="list-style-type: none"> <li>Use a Venn diagram to compare and contrast solar energy with a nonrenewable resource such as oil.</li> </ul>		

**Terms of significance that are not derived from a particular standard**

adaptation  
 adapted  
 additive  
 allele  
 arteries  
 artificial light  
 ATP  
 cellular respiration  
 celsius  
 centimeter  
 clotting  
 composition  
 consumer

deoxygenated  
 diaphragm  
 dominant  
 endoplasmic reticulum  
 erosion  
 excessive  
 extend  
 flex  
 flow chart  
 fossilized  
 graduated cylinder  
 guard cells  
 heterozygous

homozygous  
indicator solution  
juvenile  
larva  
larvae  
manipulated variable  
maturity  
measured variable  
membrane  
millimeter  
mitochondria  
mitosis  
mutation  
natural light  
nutrients  
omnivores  
organelle  
osmosis

oxygen  
oxygenated  
pH indicator  
phloem  
pores  
predator  
producer  
protein  
recessive  
standard  
sucession  
trait  
tropism  
vacuole  
veins  
venn diagram  
vital  
xylem