

MINNESOTA ACADEMIC STANDARDS GRADE 6

SCIENCE

Strand: I. HISTORY AND NATURE OF SCIENCE	Sub-Strand: A. Scientific World View	Standard: The student will understand that science is a way of knowing about the world that is characterized by empirical criteria, logical argument and skeptical review.	Benchmarks: 1. The student will distinguish between scientific evidence and personal opinion. 2. The student will explain why scientists often repeat investigations to be sure of the results. 3. The student will recognize that scientists assume that the laws of nature are the same everywhere and that they are understandable and predictable. 4. The student will define scientific facts, laws and theories.
Strand: I. HISTORY AND NATURE OF SCIENCE	Sub-Strand: B. Scientific Inquiry	Standard: The student will understand that scientific inquiry is used in systematic ways to investigate the natural world.	Benchmarks: 1. The student will identify questions that can be answered through scientific investigation and those that cannot. 2. The student will distinguish among observation, prediction and inference. 3. The student will use appropriate tools and Système International (SI) units for measuring length, time, mass, volume and temperature with suitable precision and accuracy. 4. The student will present and explain data and findings from controlled experiments using multiple representations including tables, graphs, physical models and demonstrations.
Strand: I. HISTORY AND NATURE OF SCIENCE	Sub-Strand: C. Scientific Enterprise	Standard: The student will know that science and technology are human efforts that both influence and are influenced by society.	Benchmarks: 1. The student will describe the types of questions asked, the products, and the methods of investigation used to distinguish science from technology. 2. The student will explain why scientists may work in teams or work alone, can collaborate and, at times, compete.
Strand: II. PHYSICAL SCIENCE	Sub-Strand: A. Structure of Matter	Standard: The student will understand that matter is made of small particles and this explains the properties of matter.	Benchmarks: 1. The student will know that there are more than 100 different elements with unique properties. 2. The student will use evidence to explain that matter is made of small particles called atoms or molecules which are too small to see. 3. The student will know that the mass of a substance remains constant whether it is together, in parts or in a

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			<p>different state.</p> <p>4. The student will describe the states of matter in terms of the space between particles.</p> <p>5. The student will distinguish between volume, mass and density.</p> <p>6. The student will use the characteristic properties of density, melting point, boiling point and solubility to identify and distinguish mixtures and pure substances.</p> <p>7. The student will know that atoms are the smallest unit of an element that maintains the characteristics of the element.</p>
<p>Strand: II. PHYSICAL SCIENCE</p>	<p>Sub-Strand: B. Chemical Reactions</p>	<p>Standard: The student will differentiate between chemical and physical changes.</p>	<p>Benchmarks:</p> <p>1. The student will define chemical and physical changes.</p> <p>2. The student will observe that substances react chemically with other substances to form new substances with different characteristic properties.</p> <p>3. The student will give examples and classify substances as mixtures or pure substances.</p>
<p>Strand: II. PHYSICAL SCIENCE</p>	<p>Sub-Strand: C. Energy Transformations</p>	<p>Standard: The student will understand that energy exists in many forms and can be transferred in many ways.</p>	<p>Benchmarks:</p> <p>1. The student will compare and contrast heat, chemical, mechanical and electrical energy and identify transformations of energy from one form to another in everyday situations.</p> <p>2. The student will recognize that heat is transferred by convection, conduction and radiation from warmer objects to cooler ones until both reach the same temperature.</p> <p>3. The student will demonstrate that visible light from the sun or reflected by objects may be made up of a mixture of many different colors of light.</p> <p>4. The student will recognize the relationship between light and heat.</p> <p>5. The student will describe waves in terms of speed, frequency and wave length.</p> <p>6. The student will recognize that vibrations such as sound and earthquakes move in waves and that waves move at different speeds in different materials.</p>

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Strand: II. PHYSICAL SCIENCE	Sub-Strand: D. Motion	Standard: The student will describe the motion of objects.	Benchmarks: <ol style="list-style-type: none"> 1. The student will use a frame of reference to describe the position, speed, and acceleration of an object. 2. The student will measure and graph the positions and speed of an object. 3. The student will recognize that unbalanced forces acting on an object change the object's speed and/or direction.
Strand: II. PHYSICAL SCIENCE	Sub-Strand: E. Forces of Nature	Standard: The student will understand that a variety of forces govern the structure and motion of objects in the universe.	Benchmarks: <ol style="list-style-type: none"> 1. The student will know that electric currents and magnets can exert a force on certain objects and each other. 2. The student will know that there are positive and negative charges and that like charges repel one another and opposite charges attract.