

INDEPENDENT SCHOOL DISTRICT 196
Rosemount-Apple Valley-Eagan Public Schools
Educating our students to reach their full potential

Series Number 618 Adopted April 1986 Revised June 2011

Title Science Curriculum Belief Statements and Goals

1. Belief Statements

- 1.1 We believe that the universe is a complex system, and that by working together over time people can better understand how the universe works and that natural phenomena have natural explanations. Knowledge gained from studying one part of the universe can often be applied to other parts, and while knowledge is stable it is subject to change.
- 1.2 All citizens need to be scientifically literate. The scientifically literate person is one who:
 - 1.2.1 Is aware that science, mathematics and technology are interdependent;
 - 1.2.2 Understands key concepts and principles of science;
 - 1.2.3 Is familiar with the natural world and recognizes both its themes and variations;
 - 1.2.4 Applies scientific knowledge and scientific method to issues and problems related to self and society, and
 - 1.2.5 Can understand and interpret science in the media.
- 1.3 All students should be provided with the opportunity to study a diversified science curriculum.
 - 1.3.1 An understanding of science is essential for everyone. All students should have the opportunity to participate in scientific inquiry.
 - 1.3.2 All students must be provided multiple opportunities over several years to learn and experience science.
 - 1.3.3 All students must be provided with a quality learning environment, a safe physical setting and opportunities to learn.
- 1.4 Standards-based education -- The Minnesota Academic Standards and the National Science Education Standards are fundamental to building the capacity to improve curriculum, instruction and assessment in District 196.
 - 1.4.1 Standards provide consistent direction and criteria for curriculum, instruction and assessment.
 - 1.4.2 Setting high standards that are clear and attainable will contribute to improving the achievement of all students in science education.

1.5 Learning science is an active process.

1.5.1 All students must be provided the opportunities to learn the content and process of science through varied, hands-on experiences to actively explore the natural world through inquiry while making connections to their prior knowledge.

1.5.2 Learning science requires interaction with others.

1.5.3 All students will gain a deeper understanding of science content through instructional practices that are culturally inclusive and provide multiple cultural perspectives.

1.6 Teachers are central to achieving excellence in science education.

1.6.1 Implementation of quality curriculum, instruction and assessment is possible with committed and knowledgeable teachers.

1.6.2 Teachers must be supported throughout their careers with meaningful professional development opportunities and appropriate resources in order for improvement to be lasting and substantial.

1.7 Everyone has a role in improving and sustaining quality science education.

1.7.1 Student commitment is essential for success in learning science.

1.7.2 Family support is an essential component for student success.

1.7.3 Everyone must take responsibility for developing and maintaining learning communities that support science education for all students and to help students take responsibility for learning.

2. **Goals** - A student will demonstrate knowledge of basic concepts of the nature of science and engineering, physical science, life science, and earth and space science through direct experience, including demonstrating an understanding of:

2.1 Nature of Science and Engineering

2.1.1 The Practice of Science including: understanding about science, scientific inquiry and investigation;

2.1.2 The Practice of Engineering including: understanding about engineering and engineering design; and

2.1.3 Interactions Among Science, Technology, Engineering, Mathematics and Society including: systems, careers and contributions in science and engineering, mutual influence of science, engineering and society, and the role of mathematics and technology in science and engineering.

2.2. Physical Science

- 2.2.1 Matter including: properties and structure of matter, and changes in matter;
- 2.2.2 Motion including: describing motion and forces;
- 2.2.3 Energy including: kinds of energy and energy transformation, and
- 2.2.4 Human Interactions with Physical Systems including: interaction with the environment.

2.3 Life Science

- 2.3.1 Structure and Function in Living Systems including: levels or organization and cells;
- 2.3.2 Interdependence Among Living Systems including: ecosystems and the flow of energy and matter;
- 2.3.3 Evolution in Living Systems including: reproduction, variation, and biological evolution, and
- 2.3.4 Human Interactions with Living Systems including: interaction with the environment and health and disease.

2.4 Earth and Space Science

- 2.4.1 Earth Structure and Processes including: plate tectonics, earth's changing surface, and rock sequences and earth history;
- 2.4.2 Interdependence within the Earth System including: sources and transfer of energy, weather and climate, and materials cycles;
- 2.4.3 The Universe including: solar system motion, formation of the solar system, and age, scale and origin of the universe;
- 2.4.4 Human Interactions with Earth Systems including: interaction with the environment.

References: - Minnesota Academic Standards, Science K-12, 2009
- National Science Education Standards, 1996