3501.0960 ACADEMIC SCIENCE STANDARDS FOR KINDERGARTEN THROUGH GRADE 12.

Subpart 1. **Exploring phenomena or engineering problems.**

A. Asking questions and defining problems. Students will be able to ask questions about aspects of the phenomena they observe, the conclusions the students draw from their models or scientific investigations, each other's ideas, and the information they read.

B. Asking questions and defining problems. Students will be able to ask questions about a problem to be solved so constraints and specifications can be defined for possible solutions.

C. Planning and carrying out investigations. Students will be able to design and conduct investigations in the classroom, laboratory, and/or field to test students' ideas and questions, and organize and collect data to provide evidence to support claims the students make about phenomena.

Subp. 2. **Looking at data and empirical evidence to understand phenomena or solve problems.**

A. Analyzing and interpreting data. Students will be able to represent observations and data in order to recognize patterns in the data, the meaning of those patterns, and possible relationships between variables.

B. Using mathematics and computational thinking. Students will be able to use mathematics to represent physical variables and their relationships, compare mathematical expressions to the real world, and engage in computational thinking as the students use or develop algorithms to describe the natural or designed worlds.

Subp. 3. **Developing possible explanations of phenomena or designing solutions to engineering problems.**

A. Developing and using models. Students will be able to develop, revise, and use models to represent the students' understanding of phenomena or systems as they develop questions, predictions and/or explanations, and communicate ideas to others.

B. Constructing explanations and designing solutions. Students will be able to apply scientific principles and empirical evidence (primary or secondary) to explain the causes of phenomena or identify weaknesses in explanations developed by the students or others.

C. Constructing explanations and designing solutions. Students will be able to use their understanding of scientific principles and the engineering design process to design solutions that meet established criteria and constraints.

Subp. 4. **Communicating reasons, arguments, and ideas to others.**

A. Arguing from evidence. Students will be able to engage in argument from evidence for the explanations the students construct, defend, and revise their interpretations when presented with new evidence, critically evaluate the scientific arguments of others, and present counter arguments.

B. Arguing from evidence. Students will be able to argue from evidence to justify the best solution to a problem or to compare and evaluate competing designs, ideas, or methods.

C. Obtaining, evaluating, and communicating information. Students will be able to read and interpret multiple sources to obtain information, evaluate the merit and validity of claims and design solutions, and communicate information, ideas, and evidence in a variety of formats.

D. Obtaining, evaluating, and communicating information. Students will be able to gather information about and communicate the methods used by various cultures, especially those of Minnesota American Indian Tribes and communities, to develop explanations of phenomena and design solutions to problems.

Statutory Authority: *MS s 120B.02; 120B.021*

History: *46 SR 325*

NOTE: This part is effective September 2, 2025. 46 SR 325.

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