

Interdisciplinary Problem Solving

STANDARD 7

Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.



MST Standards



Standard 7

Connections

Interconnectedness: Common Themes

Students will: apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.

Key Idea: The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/technology/society, consumer decision making, design, and inquiry into phenomena.

Performance Indicators--Students will:

Elementary

Intermediate

Commencement

- analyze science/technology/society problems and issues that affect their home, school, or community, and carry out a remedial course of action
- make informed consumer decisions by applying knowledge about the attributes of particular products and making cost/benefit tradeoffs to arrive at an optimal choice
- design solutions to problems involving a familiar and real context, investigate related science concepts to inform the solution, and use mathematics to model, quantify, measure, and compute
- observe phenomena and evaluate them scientifically and mathematically by conducting a fair test of the effect of variables and using mathematical knowledge and technological tools to collect, analyze, and present data and conclusions

- analyze science/technology/society problems and issues at the local level and plan and carry out a remedial course of action
- make informed consumer decisions by seeking answers to appropriate questions about products, services, and systems; determining the cost/benefit and risk/benefit tradeoffs; and applying this knowledge to a potential purchase
- design solutions to real-world problems of general social interest related to home, school, or community using scientific experimentation to inform the solution and applying mathematical concepts and reasoning to assist in developing a solution
- describe and explain phenomena by designing and conducting investigations involving systematic observations, accurate measurements, and the identification and control of

- analyze science/technology/society problems and issues on a community, national, or global scale and plan and carry out a remedial course of action
- analyze and quantify consumer product data, understand environmental and economic impacts, develop a method for judging the value and efficacy of competing products, and discuss cost/benefit and risk/benefit tradeoffs made in arriving at the optimal choice
- design solutions to real-world problems on a community, national, or global scale using a technological design process that integrates scientific investigation and rigorous mathematical analysis of the problem and of the solution
- explain and evaluate phenomena mathematically and scientifically by formulating a testable hypothesis, demonstrating the logical connections between the

variables; by inquiring into relevant mathematical ideas; and by using mathematical and technological tools and procedures to assist in the investigation

scientific concepts guiding the hypothesis and the design of an experiment, applying and inquiring into the mathematical ideas relating to investigation of phenomena, and using (and if needed, designing) technological tools and procedures to assist in the investigation and in the communication of results

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Interdisciplinary Problem Solving

Students will: apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.

Key Idea: Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits; gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results.

Performance Indicators--Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to:

Elementary

Intermediate

Commencement

- work effectively
- gather and process information
- generate and analyze ideas
- observe common themes
 - realize ideas
- present results

Standard 7 Interdisciplinary Problem Solving

Students will: apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.

Skills and Strategies for Interdisciplinary Problem Solving

Key Ideas:

Elementary

Intermediate

Commencement

Working Effectively: Contributing to the work of a brainstorming group, laboratory partnership, cooperative learning group, or project team; planning procedures; identify and managing responsibilities of team members; and staying on task, whether working alone or as part of a group.

Gathering and Processing Information: Accessing information from printed media, electronic data bases, and community resources and using the information to develop a definition of the problem and to research possible solutions.

Generating and Analyzing Ideas: Developing ideas for proposed solutions, investigating ideas, collecting data, and showing relationships and patterns in the data.

Common Themes: Observing examples of common unifying themes, applying them to the problem, and using them to better understand the dimensions of the problem.

Realizing Ideas: Constructing components or models, arriving at a solution, and evaluating the result.

Presenting Results: Using a variety of media to present the solution and to communicate the results.