



Priority Standards

Science Priority Standards – Grade 8

Below is a table of the priority standards.

| Priority Standards | Description |
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| MS-PS1 Matter and Its Interactions | |
| MS-PS1-1 | Develop models to describe the atomic composition of simple molecules and extended structures. |
| MS-PS1-2 | Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. |
| MS-PS1-3 | Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. |
| MS-PS1-4 | Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed. |
| MS-PS1-5 | Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. |
| MS-PS1-6 | Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.* |
| MS-PS3 Energy | |
| MS-PS3-3 | Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.* |
| MS-PS3-4 | Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample. |
| MS-PS3-5 | Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. |
| MS-PS4 Waves and Their Applications in Technologies for Information Transfer | |
| MS-PS4-1 | Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. |
| MS-PS4-2 | Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. |
| MS-PS4-3 | Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals. |
| MS-ESS2 Earth's Systems | |
| MS-ESS2-4 | Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. |
| MS-ESS2-5 | Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. |

| Priority Standards | Description |
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| MS-ESS2-6 | Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. |
| MS-ESS3 Earth and Human Activity | |
| MS-ESS3-1 | Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. |
| MS-ESS3-2 | Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. |
| MS-ESS3-3 | Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.* |
| MS-ESS3-4 | Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. |
| MS-ESS3-5 | Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. |
| MS-ETS1 Engineering Design* | |
| MS-ETS1-1 | Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. |
| MS-ETS1-2 | Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. |
| MS-ETS1-3 | Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. |
| MS-ETS1-4 | Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. |