

EARTH SCIENCE

Matter and Energy in Space

Priority Standards

Develop a model based on evidence to illustrate the life span of the Sun and the role of nuclear fusion releasing energy in the Sun's core.

Construct an explanation of the Big Bang theory based on astronomical evidence of electromagnetic radiation, motion of distant galaxies, and composition of matter in the universe.

Design a solution to a space exploration challenge by breaking it down into smaller, more manageable problems that can be solved through the structure and function of a device. *Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data to make improvements from iteratively testing solutions, and optimize a solution.*

Supporting Standard

- **Develop a model** to illustrate the changes in matter occurring in a star's life cycle.

Patterns in Earth's History and Processes

Priority Standards

Analyze and interpret data to construct an explanation for the changes in Earth's formation and 4.6-billion-year history.

Develop and use a model based on evidence of Earth's interior and describe the cycling of matter by thermal convection.

Construct an explanation for how plate tectonics results in patterns on Earth's surface.

Evaluate **design solutions** that reduce the effects of natural disasters on humans. *Define the problem, identify criteria and constraints, analyze available data on proposed solutions, and determine an optimal solution.*

Supporting Standards

- **Develop and use a model** to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales.
- **Engage in argument from evidence** for how the simultaneous co-evolution of Earth's systems and life on Earth led to periods of stability and change over geologic time.

System Interactions: Atmosphere, Hydrosphere, and Geosphere

Priority Standards

Construct an explanation of how heat (energy) and water (matter) move throughout the oceans causing patterns in weather and climate.

Construct an explanation for how energy from the Sun drives atmospheric processes and how atmospheric currents transport matter and transfer energy.

Develop and use a quantitative model to describe the cycling of carbon among Earth's systems.





DAVIS ESSENTIAL SKILLS & KNOWLEDGE

Analyze and interpret data from global climate records to illustrate changes to Earth's systems throughout geologic time and make predictions about future variations using modern trends.

Supporting Standards

- **Plan and carry out an investigation** of the properties of water and its effects on Earth materials and surface processes.
- **Analyze and interpret patterns in data** about the factors influencing weather of a given location.
- **Engage in argument from evidence** to support the claim that one change to Earth's surface can create climate feedback loops that cause changes to other systems.

Stability and Change in Natural Resources

Priority Standards

Construct an explanation for how the availability of natural resources, the occurrence of natural hazards, and changes in climate affect human activity.

Use computational thinking to explain the relationships between the sustainability of natural resources and biodiversity within Earth systems.

Evaluate **design solutions** for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios on large and small scales. *Define the problem, identify criteria and constraints, analyze available data on proposed solutions, and determine an optimal solution.*

Evaluate **design solutions** for a major global or local environmental problem based on one of Earth's systems. *Define the problem, identify criteria and constraints, analyze available data on proposed solutions, and determine an optimal solution.*

