

## **8th Grade Science Curriculum Overview**

8th grade Physical Science emphasizes the domains of chemistry and physics. Within these domains, students extend their work with science and engineering practices and continue to examine cross-cutting concepts as outlined by NGSS.

Skills to be developed throughout the course: (bulleted list of skills that students will work on throughout the course)

- 1) Asking questions (for science) and defining problems (for engineering)
- 2) Developing and using models
- 3) Planning and carrying out investigations
- 4) Analyzing and interpreting data
- 5) Using mathematics and computational thinking
- 6) Constructing explanations (for science) and designing solutions (for engineering)
- 7) Engaging in argument from evidence
- 8) Obtaining, evaluating, and communicating information

In Gower Middle 8th grade Science Classrooms:

Students will be able to develop models to describe the atomic composition of simple molecules and extended structures.

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Students will analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

Students will gather and make sense of information to describe that synthetic materials come from natural resources and impact society

Students will 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.

Students will 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

Students will undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes

Students will apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

Students will plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

Students will ask questions about data to determine the factors that affect the strength of electric and magnetic forces.

Students will construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.

Students will conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact

Students will construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object

Students will develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.

Students will apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

Students will 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

Students will 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.

Students will 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.

Students will develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

Students will 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

#### Units of Study:

- Measurement & Properties
- Physical and Chemical change
- Thermal Energy
- Periodic Table & Atoms
- Waves & Light Energy
- Energy Transformations
- Forces and Motion
- Electromagnetism

The Learning Standards for this course are (ie Common Core Standards, Illinois Learning Standards, National Standards). Priority standards should be listed and linked below:

[Next Generation Physical Science Standards](#)