



8th Grade Science

The essential skills and knowledge for this Davis School district course focuses on the integration of science and engineering practices, cross cutting concepts, and disciplinary core ideas to produce a STEM focused environment.

Matter and Energy Interact in the Physical World

- a. **Develop a model** to describe the scale and proportion of atoms and molecules.
- b. **Obtain information** about various properties of matter, evaluate how different materials properties allow them to be used for particular functions in society, and communicate your findings.
- c. **Plan and conduct an investigation** and then **analyze and interpret the data** to identify patterns in changes in a substance's properties to determine whether a chemical reaction has occurred.
- d. **Obtain and evaluate information** to describe how synthetic materials come from natural resources, what their functions are, and how society uses these new materials.
- e. **Develop a model** that uses **computational thinking** to illustrate cause and effect relationships in particle motion, temperature, density, and state of a pure substance when thermal energy is added or removed.
- f. **Develop a model** to describe how the total number of atoms does not change in a chemical reaction, indicating that matter is conserved.
- g. **Design**, construct, and test a device that can affect the rate of a phase change.

Energy is Stored and Transferred in Physical Systems

- h. Use **computational thinking** to **analyze data** about the relationship between the mass and speed of objects and the relative amount of kinetic energy of the objects.
- i. **Ask questions** about how the amount of potential energy varies as distance within the system changes then **plan and conduct investigations** to answer questions about potential energy.
- j. **Engage in argument** to identify the strongest evidence supporting the claim that the kinetic energy of an object changes as energy is transferred to or from the object.
- k. Use **computational thinking** to describe a simple **model** for waves that shows the pattern of wave amplitude being related to wave energy.
- l. **Develop and use a model** to describe the structure of waves and how they are reflected, absorbed, or transmitted through various materials.
- m. **Obtain and evaluate information** to **communicate** the claim that the structure of digital signals are a more reliable way to store or transmit information than analog signals.



Life Systems Store and Transfer Matter and Energy

- n. **Plan and conduct an investigation** and use the evidence to **construct an explanation** of how photosynthetic organisms use energy to transform matter.
- o. **Develop a model** to describe how food is changed through chemical reactions to form new molecules that support growth and/or release energy as matter cycles through an organism.
- p. **Ask questions to obtain, evaluate, and communicate** information about how changes to an ecosystem affect the stability of cycling matter and the flow of energy among living and nonliving parts of an ecosystem.

Interactions with Natural Systems and Resources

- a. **Construct a scientific explanation** based on evidence that shows the uneven distribution of Earth's mineral, energy, and groundwater resources is caused by geological processes.
- b. **Engage in argument** supported by evidence about the effect of per-capita consumption of natural resources on Earth's systems.
- c. **Design a solution** to monitor or mitigate the potential effects of the use of natural resources. **Evaluate competing design solutions** using a systematic process to determine how well each solution meets the criteria and constraints of the problem.
- d. **Analyze and interpret data** on the factors that change global temperatures and their effects on regional climates.
- e. **Analyze and interpret patterns** in the occurrence of natural hazards to forecast future catastrophic events, and **investigate** how data are used to develop technologies to mitigate their effects.