SAU9 Science Competencies 2020-2021

Grades 9-12

Physcial Science

Student will use science and engineering practices to

- ·demonstrate an understanding between interactions between atoms and molecules, and how these interactions affect the properties of substances
- · demonstrate an ability to make predictions about the interactions of objects based on the properties of objects and the forces between them
- ·demonstrate an understanding that energy can be accounted for as either motion or relative positions of particles

Biology

Students will use science and engineering practices to

- ·demonstrate understanding of how systems of cells fuction to support life processes
- ·demonstrate understanding of the factors causing natural selection and the process of evolution of species over
- ·construct explanations for the role of energy in the cycling of matter in organisms and ecosystems
- ·demonstrate understanding of the relationship of DNA and chromosomes in the processes of cellular division that pass traits from one generation tot he next

KHS Electives

Earth Science

Students will use science practices to

- · construct explanations for the scales of time over which Earth processes, operate,
- · understand factors that control the weather and how changes in those factors influencece climate
- ·explain earth events related to the earth's place and motion within the universe.

Chemistry

Students will use science practices to

- ·demonstrate understanding of interactions between atoms and molecules and how these interactions affect properties of substances
- ·demonstrate how matter interacts and changes that result from those interactions
- ·use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.

Environmental Science

Students will use science practices to

- ·construct explanations for the role of energy in the cycling of matter in ecosystems, supported by mathematical models
- ·demonstrate an ability to investigate the role of biodiversity in ecosystems and the role of animal behavior on survival
- ·demonstrate how the interactions between organisms maintain balance within the larger ecosystem
- ·understand interdependencies between humans and the rest of Earth's systems

Physics:

Students will use science practices to

- ·construct explanations for the role of energy in the cycling of matter in ecosystems, supported by mathematical models
- ·investigate the role of biodiversity in ecosystems and the role of animal behavior on survival of individuals and species
- ·demonstrate how interactions between organisms maintain balance within ecosystems
- ·understand interdependencies between humans and Earth's systems

Grades 6-8

Physical Science

Students will use science and engineering practices to

- ·apply their knowledge of energy transfer and the human body to explore how they are able to make objects move.
- ·apply their knowledge of matter and its interactions to answer scientific questions and design solutions to problems.
- ·apply their knowledge of waves and energy to answer scientific questions and design solutions to problems.

Life Science

Students will use science and engineering practices to

- ·apply their knowledge of the environment and genetics to explain a natural phenomenon.
- ·apply their knowledge of human impacts on organisms in order to compare and
- ·evaluate potential solutions
- ·apply their knowledge of ecosystem dynamics to answer scientific questions and design solutions to problems.
- ·apply their knowledge of mechanisms of diversity among living organisms to answer scientific questions and design solutions to problems.

Earth Science

Students will use science and engineering practices to

- ·apply their knowledge of climate and thermal energy to design a solution to a problem.
- ·apply their knowledge of human impacts on earth's systems to answer scientific questions and design solutions to problems.
- ·apply their knowledge of the changing Earth throughout history to answer scientific questions and design solutions to problems.

Grades 4-5

Physical Science

Students will use science and engineering practices to

- ·support evidence-based explanations about the transfer or energy within and between systems
- ·model patterns and impacts of waves
- ·create models of characteristics of matter, its states, and they way it reacts when combined

Life Science

Students will use science and engineering practices to

- ·model how plant and animal structures support growth, behavior, and reproduction
- ·develop models that demonstrate and apply understanding of how energy flows through ecosystems

Earth Science

Students will use science and engineering practices to

- ·solve problems relating to the effects of weathering and natural Earth processes on Earth's features
- ·graph data about where water is found on Earth and how it cycles
- ·identify patterns in daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky

Grades 2-3

Physical Science

Students use science and engineering practices to

- ·demonstrate an understanding of different properties of matter through analysis and classification.
- ·to demonstrate an understanding of balanced and unbalanced forces on the motion of an object and the cause and effect relationships of electric or magnetic interactions between two objects.

Life Science

Students use science and engineering practices to

- ·demonstrate an understanding of plants' needs, structures, and functions and compare the diversity of life in different habitats.
- ·demonstrate an understanding of how and why organisms are different from one another and how they are affected by their environments.

Earth Science

Students use science and engineering practices to

- ·demonstrate an understanding that wind and water can cause changes to the Earth very quckly or very slowly.
- ·demonstrate an understanding of typical weather conditions by oragnizing and using data, making a claim about a solution that reduces impacts of weather hazards.

Grades K-1

Physical Science

Students use science and engineering practices to

- ·demonstrate an understanding of the effects of different strengths or different directions of pushes and pulls on the motion of an object.
- ·demonstrate an understanding of the relationship between sound and vibrating materials, as well as the availability of light and abilty to see objects.

Life Science

Students use science and engineering practices to

- ·demonstrate an understanding of what plants and animals (including humans) need to survive and the relationship between their needs and where they live.
- ·demonstrate an understanding of patterns of living things (e.g., how they grow and survive; how parents help offspring).

Earth Science

Students use science and engineering practices to

- ·demonstrate an understanding of patterns in local weather the purpose of weather forecasting to prepare for, and respond to, severe weather.
- ·demonstrate an understanding of the influence of light and solar patterns.