

# Grades 9, 10, 11, 12

Adopted 2018

## Matter and Its Interactions

**SES-HS-PS1-1.** Using a model, identify the parts of an atom (protons, neutrons, electrons). [SES-HS-PS1-1](#)

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**SES-HS-PS1-2.** Use a periodic table to identify symbols and atomic numbers for five main group elements (1-20.) [SES-HS-PS1-2](#)

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**SES-HS-PS1-3.** Using models, investigate the results of changes in states of matter. [SES-HS-PS1-3](#)

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**SES-HS-PS1-4.** Using a model, determine if the product absorbs or releases energy, when given the reactants in a chemical reaction. [SES-HS-PS1-4](#)

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**SES-HS-PS1-5.** Conduct an investigation measuring temperature differences, while observing and recording the reactions. [SES-HS-PS1-5](#)

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**SES-HS-PS1-6.** Conduct a chemical experiment by changing a variable. [SES-HS-PS1-6](#)

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**SES-HS-PS1-7.** Integrated in PS1-4. [SES-HS-PS1-7](#)

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**SES-HS-PS1-8.** Compare models which illustrate fusion, fission, and radioactive decay. [SES-HS-PS1-8](#)

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## Motion and Stability: Forces and Interactions

**SES-HS-PS2-1.** Predict the outcome, when changing either mass or force, in an experiment using Newton's Second Law of Motion. [SES-HS-PS2-1](#)

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**SES-HS-PS2-2.** Demonstrate what happens to the velocity of an object when the mass of the [SES-HS-PS2-2](#)

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**SES-HS-PS2-3.** Select between a variety of designs to minimize force on an object, during a collision, and record outcomes. [SES-HS-PS2-3](#)

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**SES-HS-PS2-4.** Demonstrate that gravitational forces are constant. [SES-HS-PS2-4](#)

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**SES-HS-PS2-5.** Conduct an experiment to test for a magnetic field around an electromagnet. [SES-HS-PS2-5](#)

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**SES-HS-PS2-6.** Demonstrate why material selection is important in building stable structures. [SES-HS-PS2-6](#)

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## Energy

**SES-HS-PS3-1.** Demonstrate the differences in the energy of a system when a component is changed. [SES-HS-PS3-1](#)

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**SES-HS-PS3-2.** Demonstrate that energy manifests itself in multiple ways, such as motion, sound, light, and thermal energy. [SES-HS-PS3-2](#)

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**SES-HS-PS3-3.** Conduct an experiment to convert one form of energy to another form of energy. [SES-HS-PS3-3](#)

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**SES-HS-PS3-4.** Conduct an experiment demonstrating the transfer of thermal energy when two components, of different temperature, are combined within a closed system. [SES-HS-PS3-4](#)

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**SES-HS-PS3-5.** Demonstrate that when two interacting objects change position, the interacting forces change. [SES-HS-PS3-5](#)

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## Waves and Their Applications in Technologies for Information Transfer

**SES-HS-PS4-1.** Demonstrate that simple waves have a repeating pattern with a specific wavelength, frequency, and amplitude. [SES-HS-PS4-1](#)

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**SES-HS-PS4-2.** Explore both physical and digital storage. [SES-HS-PS4-2](#)

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**SES-HS-PS4-3.** Not applicable. [SES-HS-PS4-3](#)

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**SES-HS-PS4-4.** No standard at this level. [SES-HS-PS4-4](#)

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**SES-HS-PS4-5.** Not applicable. [SES-HS-PS4-5](#)

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## From Molecules to Organisms: Structures & Processes

**SES-HS-LS1-1.** Construct a model of DNA. [SES-HS-LS1-1](#)

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**SES-HS-LS1-2.** Construct a model of hierarchical organization of interacting systems from smallest to largest. [SES-HS-LS1-2](#)

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**SES-HS-LS1-3.** Identify a feedback mechanism that helps maintain homeostasis. [SES-HS-LS1-3](#)

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**SES-HS-LS1-4.** Use a model to demonstrate mitosis. [SES-HS-LS1-4](#)

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**SES-HS-LS1-5.** Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. [SES-HS-LS1-5](#)

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**SES-HS-LS1-6.** Construct models of carbon-based molecules. [SES-HS-LS1-6](#)

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**SES-HS-LS1-7.** Use a model to demonstrate that energy can be transferred through breaking and forming bonds. [SES-HS-LS1-7](#)

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## Ecosystems: Interactions, Energy, and Dynamics

**SES-HS-LS2-1.** Describe how the population of a species changes in relation to the availability of resources. [SES-HS-LS2-1](#)

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**SES-HS-LS2-2.** Identify factors that affect biodiversity in different environments. [SES-HS-LS2-2](#)

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**SES-HS-LS2-3.** Construct models of matter and energy cycles. [SES-HS-LS2-3](#)

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**SES-HS-LS2-4.** Integrated in SES-HS-LS2-3. [SES-HS-LS2-4](#)

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**SES-HS-LS2-5.** Construct a model of the carbon cycle to include interaction with the atmosphere. [SES-HS-LS2-5](#)

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**SES-HS-LS2-6.** Demonstrate how a change in conditions can change an ecosystem. [SES-HS-LS2-6](#)

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**SES-HS-LS2-7.** Compare and contrast detrimental or enhancing impacts on the environment. [SES-HS-LS2-7](#)

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**SES-HS-LS2-8.** Identify organisms that demonstrate group behaviors. [SES-HS-LS2-8](#)

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### **Heredity: Inheritance and Variation of Traits**

**SES-HS-LS3-1.** Identify traits that are passed from parent to offspring. [SES-HS-LS3-1](#)

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**SES-HS-LS3-2.** Demonstrate that mutations can occur in DNA. [SES-HS-LS3-2](#)

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**SES-HS-LS3-3.** Not applicable. [SES-HS-LS3-3](#)

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### **Biological Evolution: Unity & Diversity**

**SES-HS-LS4-1.** Construct a model demonstrating lineage from an ancient extinct animal to a modern animal. [SES-HS-LS4-1](#)

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**SES-HS-LS4-2.** Demonstrate how a population can adapt to survive. [SES-HS-LS4-2](#)

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**SES-HS-LS4-3.** Not applicable. [SES-HS-LS4-3](#)

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**SES-HS-LS4-4.** Demonstrate how a population can change based on natural selection. [SES-HS-LS4-4](#)

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**SES-HS-LS4-5.** Using evidence indicate the emergence of a new species over time. [SES-HS-LS4-5](#)

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**SES-HS-LS4-6.** Observe and describe the impacts of human activity on biodiversity. [SES-HS-LS4-6](#)

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### **Earth's Place in the Universe**

**SES-HS-ESS1-1.** Construct a model to illustrate the life span of the sun. [SES-HS-ESS1-1](#)

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**SES-HS-ESS1-2.** Construct a model of the expanding Universe. [SES-HS-ESS1-2](#)

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**SES-HS-ESS1-3.** Compare life cycles of other stars to our sun. [SES-HS-ESS1-3](#)

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**SES-HS-ESS1-4.** Use a simulation to represent the motion of orbiting objects in the solar system. [SES-HS-ESS1-4](#)

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**SES-HS-ESS1-5.** Use models to explore the theory of plate tectonics. [SES-HS-ESS1-5](#)

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**SES-HS-ESS1-6.** From a model, construct an account of Earth's formation and early history. [SES-HS-ESS1-6](#)

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## Earth's Systems

**SES-HS-ESS2-1.** Construct a model that demonstrates the formation of valleys and mountains. [SES-HS-ESS2-1](#)

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**SES-HS-ESS2-2.** Construct a model demonstrating that one change to Earth's surface can cause changes to other Earth systems. [SES-HS-ESS2-2](#)

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**SES-HS-ESS2-3.** Construct a model of the Earth's interior. [SES-HS-ESS2-3](#)

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**SES-HS-ESS2-4.** Use a model to identify changes in the flow of energy that can change the climate. [SES-HS-ESS2-4](#)

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**SES-HS-ESS2-5.** Construct a model depicting how water in the form of ice, liquid, and/or gas has changed the landscape. [SES-HS-ESS2-5](#)

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**SES-HS-ESS2-6.** Integrated in SES-HS-LS2-5. [SES-HS-ESS2-6](#)

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**SES-HS-ESS2-7.** Explain how life on Earth had to adapt to changes in the atmosphere, hydrosphere, or geosphere. [SES-HS-ESS2-7](#)

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## Earth and Human Activity

**SES-HS-ESS3-1.** Demonstrate how the availability of natural resources, the occurrence of natural hazards, and/or changes in climate have influenced human activity. [SES-HS-ESS3-1](#)

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**SES-HS-ESS3-2.** From factors provided, select which factors need to be considered, prior to developing energy or mineral resources. [SES-HS-ESS3-2](#)

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**SES-HS-ESS3-3.** Integrated in SES-HS-ESS3-2. [SES-HS-ESS3-3](#)

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**SES-HS-ESS3-4.** Construct a model of a technological solution that reduces impacts of human activities on natural systems. [SES-HS-ESS3-4](#)

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**SES-HS-ESS3-5.** Use global climate models to identify global, or regional, change in climate and associated future impacts to Earth systems. [SES-HS-ESS3-5](#)

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**SES-HS-ESS3-6.** Use a computational representation to illustrate how changes to the environment affect Earth systems. [SES-HS-ESS3-6](#)

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## Engineering, Technology, & Applications of Science

**SES-HS-ETS1-1.** Identify a local, regional, or global challenge for solutions that account for societal needs and wants. [SES-HS-ETS1-1](#)

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**SES-HS-ETS1-2.** Identify a solution to a real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. SES-HS-ETS1-2

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**SES-HS-ETS1-3.** Identify solutions to a real-world problem based on a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts. SES-HS-ETS1-3

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**SES-HS-ETS1-4.** Use a computer simulation to model the impact of proposed solutions to a real-world problem. SES-HS-ETS1-4

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**SES-HS-ETS1-5.** Given reliable materials, identify valid vs. invalid claims. SES-HS-ETS1-5