

Grade 5 Science Standards

Earth & Space Science

5.ESS1 *Earth's Place in the Universe*

5.ESS1.1 Support an argument that the apparent brightness of the sun and stars is due to their relative distances from Earth. [Clarification Statement: Emphasis is to obtain information and construct an explanation on how the scale of the distance to objects giving off light affects the brightness of objects (e.g. nearby streetlights appear bigger and brighter than distant streetlights).] [Assessment Boundary: Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, and stage).]

5.ESS1.2 Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. [Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.] [Assessment Boundary: Assessment does not include causes of seasons.]

5.ESS2 *Earth's Systems*

5.ESS2.1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.[^] [Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.] [Assessment Boundary: Assessment is limited to the interactions of two systems at a time.]

5.ESS2.2 Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. [Clarification Statement: Emphasis is on models to organize data about the quantity of saltwater and freshwater in various reservoirs and graph data to compare the proportions of saltwater and freshwater on Earth.] [Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.]

5.ESS3 *Earth and Human Activity*

5.ESS3.1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.[^] [Clarification Statement: Emphasis is on gathering data to construct an explanation on how and why the selected activity protects the Earth's resources and environment for the identified region or community (e.g. agriculture practices, solar or wave energy).] [Assessment Boundary: Assessment is limited to describing how communities use science ideas to protect Earth's resources and environment and does not focus on cause and effect of human impacts on the environment.]

Engineering, Technology, and the Application of Science

5.ETS1 *Engineering Design*

- 5.ETS1.1** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. [Clarification Statement: A design problem must be identified before solutions are developed. Solutions or designs identify the criteria for success and identify limitations and constraints.][Assessment Boundary: Assessment does not include limitations or criteria based on specific process or system boundaries (e.g. limitations of scientific principles or long-term societal and environmental impacts).]
- 5.ETS1.2** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. [Clarification Statement: Emphasis is on researching a problem prior to designing a solution, plan for testing to evaluate how well it will perform under a range of likely conditions using scientific knowledge and communicating the design process.][Assessment Boundary: Assessment is limited to the design process and modeling.]
- 5.ETS1.3** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. [Clarification Statement: Emphasis is on identifying the purpose of the investigation and specific evidence to collect, testing one criteria or constraint at a time, and record the data accordingly.][Assessment Boundary: Assessment is limited to proposing different solutions based on evidence collected and to determine which is best based on the criteria and the constraints.]

Life Science

5.LS1 *From Molecules to Organisms: Structures and Processes*

- 5.LS1.1** Support an argument that plants get the materials they need for growth chiefly from air and water.[^] [Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.][Assessment Boundary: Assessment does not include photosynthesis or the photosynthesis reaction equation.]

5.LS2 *Ecosystems: Interactions, Energy, and Dynamics*

- 5.LS1.2** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.[^] [Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.]

Physical Science

5.PS1 *Matter and Its Interactions*

- 5.PS1.1** Develop a model to describe that matter is made of particles too small to be seen.[^] [Clarification Statement: Examples of evidence could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.] [Assessment Boundary: Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.]

- 5.PS1.2 Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.** [Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that forms new substances.] [Assessment Boundary: Assessment does not include distinguishing mass and weight.]
- 5.PS1.3 Make observations and measurements to identify materials based on their properties.** [Clarification Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] [Assessment Boundary: Assessment does not include density or distinguishing mass and weight.]
- 5.PS1.4 Conduct an investigation to determine whether the mixing of two or more substances results in new substances.** [Clarification Statement: Emphasis is to investigate the effect of combining various substances to determine if a new substance is formed. Quantitative or qualitative data will be collected (e.g. weight or mass, temperature, state of matter, color, texture, odor).][Assessment Boundary: Assessment does not include having students distinguish between mass and weight. This specific distinction occurs in middle grades.]
- 5.PS2 Motion and Stability: Force and Interactions*
- 5.PS2.1 Support an argument that the gravitational force exerted by Earth on objects is directed down.** [Clarification Statement: “Down” is a local description of the direction that points toward the center of the spherical Earth.] [Assessment Boundary: Assessment does not include mathematical representation of gravitational force.]
- 5.PS3 Energy*
- 5.PS3.1 Use models to describe that energy in animals’ food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.** [Clarification Statement: Examples of models could include diagrams, and flow charts.][Assessment Boundary: Assessment does not include photosynthesis or the photosynthesis reaction equation. Students should know that plants carry out photosynthesis for energy, but they do not need to know the specifics of the process or equation. Similarly, this assessment does not include the process or mechanisms for metabolism. Students should understand the relationship between animals and the food they eat to obtain energy for bodily functions, growth, and repair.]

*This performance expectation integrates traditional science content with engineering through a practice or disciplinary core idea.

^This performance expectation references [a proximal connection to climate change](#) and the disciplinary core ideas: Earth’s Systems and Earth and Human Activity.