

Fifth Grade Science

Course Description (Storyline):

The performance expectations in fifth grade help students formulate answers to questions such as: “When matter changes, does its weight change? How much water can be found in different places on Earth? Can new substances be created by combining other substances? How does matter cycle through ecosystems? Where does the energy in food come from and what is it used for? How do lengths and directions of shadows or relative lengths of day and night change from day to day, and how does the appearance of some stars change in different seasons?” Students are able to describe that matter is made of particles too small to be seen through the development of a model. Students develop an understanding of the idea that regardless of the type of change that matter undergoes, the total weight of matter is conserved. Students determine whether the mixing of two or more substances results in new substances. Through the development of a model using an example, students are able to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. They describe and graph data to provide evidence about the distribution of water on Earth. Students develop an understanding of the idea that plants get the materials they need for growth chiefly from air and water. Using models, students can describe the movement of matter among plants, animals, decomposers, and the environment and that energy in animals’ food was once energy from the sun. Students are expected to develop an understanding of patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. The crosscutting concepts of patterns; cause and effect; scale, proportion, and quantity; energy and matter; and systems and systems models are called out as organizing concepts for these disciplinary core ideas. In the fifth grade performance expectations, students are expected to demonstrate grade-appropriate proficiency in developing and using models, planning and carrying out investigations, analyzing and interpreting data, using mathematics and computational thinking, engaging in argument from evidence, and obtaining, evaluating, and communicating information; and to use these practices to demonstrate understanding of the core ideas.

Course Rationale:

Knowledge of science, as well as engineering and technology (as stated in the Next Generation Science Standards), is critical in preparing all students for higher education and jobs of the future as well as becoming informed, voting citizens. In addition, students need to gain substance in reading, writing, and figuring math solutions which allows for natural integration within the sciences. It is of critical importance to instill a high interest and knowledge of science so all students can succeed in a technologically advanced, global society whether they choose to pursue college or the workforce upon graduation.

Course Curriculum Map:

Appendix – fifth grade scope and sequence

Course Materials and Resources:

- Pearson Interactive Science Edition + Digital Courseware 7 year license-1,500
- Teacher Edition Package-60 free
- Leveled Reader Library-60 sets (30 free/30 paid)
- Science Activity Card Set-60 free
- STEM Activity Book 60 free
- Science, Social Studies and ELA Connections books-60 free
- Science Examview CD and Untamed Science DVD-free
- Science Leveled Reader Database Teacher Access Pack grade k – 5- 60 free

5th Grade Science

1st Quarter

Space Systems: Stars and the Solar System

- 5-PS2-a. Support an argument that the gravitational force exerted by the Earth on objects near Earth's surface is directed toward the Earth's center. [Clarification Statement: Support will be drawn from diagrams, evidence, and data that are provided. Earth causes objects to have a force on them that point toward the center of the Earth.] [Assessment Boundary: Mathematical representation of gravitational force is not assessed.]
- 5-ESS1-b. Use a model of the relative positions and motion of the sun, Earth, and moon to describe the observed pattern of daily changes in length and direction of shadows, day and night, and the phases of the moon. [Assessment Boundary: Causes of seasons are not to be assessed.]
- 5-ESS1-a. Interpret provided data about the relative distances of the sun and other stars from Earth to explain the difference in their apparent brightness.
- 5-ESS1-c. Identify evidence that supports explanations for how the position of stars, constellations, and planets in the sky change in consistent patterns as the Earth rotates and orbits the sun along with the other planets. [Clarification Statement: Evidence consists of information from observations and other sources of the positions of objects in the night sky.] [Assessment Boundary: Performances do not require understanding the mechanism for seasons.]
- 5-PS4-a. Apply scientific knowledge of how lenses bend light to design a tool to enhance vision. [Clarification Statement: Examples of tools that use lenses include telescopes, binoculars, microscopes, and eyeglasses.] [Assessment Boundary: Quantitative details of refraction not to be included.]

- 5-PS4-b. Communicate information of how technology has improved over time to increase our ability to see objects and make scientific discoveries about the universe. [Assessment Boundary: Students should be able to interpret information that is provided to them rather than memorizing specific examples.]

5th Grade Science

2nd Quarter

Earth's Surface Systems

- 5-ESS2-a. Use models to describe interactions between the geosphere, hydrosphere, atmosphere, and biosphere and identify the limitations of the models. [Clarification Statement: The geosphere, hydrosphere, atmosphere, and biosphere are each a system.] [Assessment Boundary: Students should only be assessed on the interactions of two systems at a time.]
- 5-ESS2-b. Use evidence from observations to explain the role of the ocean in supporting ecosystems and their organisms, shaping landforms, and influencing climate. [Clarification Statement: Evidence for supporting ecosystems could include distribution of fish. Evidence for shaping landforms could include pictures of coastal erosion. Evidence for influencing climate could include temperature patterns in coastal vs. continental regions.] [Assessment Boundary: Students should only be assessed on the role of the ocean in supporting ecosystems in general, not on specific ecosystems.]
- 5-ESS2-c. Construct and revise models to describe how wind and clouds interact with landforms to determine patterns of weather. [Clarification Statement: An example could be when clouds go over mountains, they release their water as precipitation.] [Assessment Boundary: Assessment should not include weather maps.]
- 5-ESS3-a. Design and evaluate a solution to an environmental problem that decreases risks, increases benefits, or better meets societal demands for new or improved technologies. [Clarification Statement: Examples of solutions could be designing a cost-effective water filtration system that reduces pollutants in a river, conducting an energy audit, and developing a plan to reduce energy use.]
- 5-ESS3-b. Construct explanations for how humans and other organisms will be affected if Earth's temperature continues to rise. [Clarification Statement: Examples of effects on humans and other organisms could include local area changes in crop growing seasons, coral reefs, and habitats for polar organisms.] [Assessment Boundary: The Greenhouse Effect and details of climate change are not assessed.]

5th Grade Science

3rd Quarter

Matter and Energy in Organisms and Ecosystems

- 5-LS2-d. Ask questions about what organisms obtain from the environment and what they release as waste matter back into the environment. [Clarification Statement: Air, water, and minerals (fertilizers) are needed by plants but are not food for them; plants use energy from light to make food from non-food, primarily air and water.] [Assessment Boundary: Students should be assessed on the idea that plants make their own food from materials that are not food (air and water), not the process of photosynthesis.]
- 5-PS3-a. Use models to describe that energy animals use to maintain body warmth, body repair, and for motion was once energy from the sun. [Clarification Statement: Energy is not transferred by the digestion of food in the digestive system but in the cells after digested food has been absorbed. Care must be taken to avoid creating the misconception that the energy from food is released in the stomach and intestines.]
- 5-LS2-b. Formulate questions and predict outcomes about how organisms, such as fungi and bacteria, operate as decomposers to restore (recycle) some materials back to the soil for plants to use in local ecosystems. [Clarification Statement: Minerals and fertilizer are not food for plants.]
- 5-LS2-a. Construct and use models of food webs to describe the transfer of matter among plants, animals, decomposers, and the environment and discuss limitations of these models. [Clarification Statement: Examples of systems could be: organisms, ecosystems, and the Earth. Matter is transported among and within systems.]
- 5-LS2-c. Use models to test the functioning of a designed process that mitigates a factor upsetting the stability of a local ecosystem. [Clarification Statement: Factors that upset an ecosystem's stability include: invasive species, drought, human development, and removal of predators. Models could include simulations, and representations, etc.]

5th Grade Science

4th Quarter

SPM Structure and Properties of Matter

- 5-PS1-c. Make observations and measurements to identify given materials to identify given materials based on their properties. [Clarification Statement: Examples of materials to be identified could include baking soda and metal. Both qualitative and quantitative measurements and observations should be used.] [Assessment Boundary: Density is not intended as an identifiable property.]
- 5-PS1-a. Argue from evidence to support the theory that matter is made of particles too small to be seen. [Clarification Statement: Examples of evidence could include adding air to a basketball, compressing air in a syringe, or moving air on a piece of paper.]
- 5-PS1-b. Use simple models to describe that regardless of what reaction or change in properties occur, the total weight of the substances involved does not change.
- 5-PS1-d. Design and conduct investigations on the mixing of two or more different substances to determine whether a new substance with new properties is formed. [Clarification Statement: examples of interactions forming new substances can include mixing baking soda and vinegar. Examples of interactions not forming new substances can include mixing baking soda and water.]
- 5-PS1-e. Generate and compare multiple solutions that meet the desired criteria of improving a property of a material within the constraints of changing the type of substances, the amount of substances used to make the material, and the temperature at which they are mixed.