Connecticut Science

Grade 6

Adopted 2010

Properties of Matter

1. **Materials can be classified as pure substances or mixtures, depending on their chemical and physical properties.** 6.1
    1. Describe the structure of the atom and its component parts.
    2. Explain that density (mass/volume) is a characteristic property that can be used to identify an element or substance.
    3. Compare and contrast the properties of a metal (aluminum, iron, etc.) with a nonmetal (oxygen, carbon, etc.)
    4. Illustrate the differences in the physical and chemical properties of a molecule and the individual atoms that bonded to form that molecule.
    5. Differentiate between a mixture and an element or compound and identify examples.
    6. Conduct and report on an investigation that uses physical means such as particle size, density, solubility and magnetism to separate substances in a mixture.
    7. Use the patterns in the Periodic Table to locate metals, semimetals and nonmetals and to predict the general characteristics of an element.

Energy in the Earth's Systems

3. **Variations in the amount of the sun's energy hitting the Earth's surface affect daily and seasonal weather patterns.** 6.3
    1. Compare the composition and structure of the Earth's atmospheric layers.
    2. Demonstrate how changes in temperature, pressure, moisture and density of air affect weather patterns (e.g., air masses and air pressure.)
    3. Describe in writing how solar energy drives Earth's weather systems.
    4. Investigate and report on how the introduction of heat affects the motion of particles and the distance between them.
    5. Illustrate the transfer of energy as matter changes phase.
    6. Design, conduct and report in writing an investigation that reveals different substances absorb and release heat at different rates.
    7. Research and give examples of heat transfer and local weather differences in Connecticut.
    8. Investigate and explain the movement of local winds, including "sea breezes" and "land breezes," based on the uneven heating of the Earth's surface and a change in air pressure.

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9. Examine and explain that global winds are caused by uneven heating of the Earth's surface and the rotation of the Earth.
10. Design a weather forecast based on collected weather data.

Science and Technology in Society

4. **Water moving across and through earth materials carries with it the products of human activities.
 This content standard is an application of the concepts in content standard 6.3 and should be integrated into the same unit.** 6.4
    1. Discuss and chart the reasons why water is essential for life.
    2. Observe, analyze and record the unique physical and chemical properties of water.
    3. Research the differences in quantities between fresh water (solid and liquid) and salt water covering the Earth's surface and report on the impact to humans.
    4. Investigate and explain in writing how substances, both harmful and beneficial, dissolve in and are carried by surface and ground water.
    5. Use appropriate maps to locate and identify the major watersheds that drain into Long Island Sound and analyze how the topography influences the way water moves in the Long Island Sound watershed.
    6. Research and evaluate in writing the effects of common point and nonpoint water pollutants in Connecticut.
    7. Compare and contrast the general structures, processes and limitations of a septic system to a secondary wastewater treatment plant.
    8. Debate the effectiveness of a law designed to protect water resources.

Matter and Energy in Ecosystems

2. **An ecosystem is composed of all the populations that are living in a certain space and the physical factors with which they interact.** 6.2
    1. Analyze and interpret how biotic and abiotic factors interact within a given ecosystem.
    2. Design and conduct a scientific investigation to explore the porosity and permeability of soils and their ability to support different plant life.
    3. Defend the statement, "The sun is the main source of energy on Earth."
    4. Express in general terms how plants and other photosynthetic organisms use the sun's energy.
    5. Investigate and report on the effects of abiotic factors on a plant's ability to photosynthesize.
    6. Compare and contrast how energy and matter flow in a Connecticut ecosystem, emphasizing the interactions among producers, consumers and decomposers.
    7. Identify local examples of predator-prey relationships and justify the impact of each type of population on the other.
    8. Create and interpret graphs that illustrate the fluctuation of populations over time.
    9. Distinguish a food chain from a food web and identify local examples of each.

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10. Explain the impact of environmental conditions such as climate, elevation, topography or water quality on food chains.
11. Predict what will happen to a population based on current trends (fires, disease, overhunting, development) and defend the prediction.