

Dr. Art Does Science DVD

National Science Standards Correlations

Grades 5-8: Design and Conduct a Scientific Investigation

Students should develop general abilities, such as systematic observation, making accurate measurements, and identifying and controlling variables. **Electromagnetism, Respiration, Chemical Reactions**

Grades 5-8: Properties and Changes of Properties in Matter

Substances react chemically in characteristic ways with other substances to form new substances (compounds) with different properties. **Chemical Reactions**

Chemical elements do not break down during normal laboratory reactions involving such treatments as heating, exposure to electric current, or reaction with acids.

Elements Experiment

There are more than 100 known elements. **Elements Song**

Grades 5-8: Transfer of Energy

Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei, and the nature of a chemical. Energy is transferred in many ways. **Energy**

The sun is a major source of energy for changes on earth's surface. The sun loses energy by emitting light. A tiny fraction of that light reaches the earth. **Greenhouse Effect**

Grades 5-8: Structure and Function in Living Systems

Cells carry on the many functions needed to sustain life. **Respiration**

Grades 5-8: Populations and Ecosystems

For ecosystems the major source of energy is light. Energy entering ecosystems as light is transferred by producers into chemical energy through photosynthesis. That energy then passes from organism to organism in food webs. **Planet Earth Show**

Grades 5-8: Risks and Benefits

Risk analysis considers the type of hazard and estimates the number of people that might be exposed and the number likely to suffer consequences. The results are used to determine the options for reducing or eliminating risk. **Global Emissions**

Grades 9-12: Chemical Reactions

Chemical reactions may release or consume energy. Some reactions such as the burning of fossil fuels release large amounts of energy by losing heat and by omitting light. **Chemical Reactions**

Grades 9-12: The Cell

Plants and many microorganisms use solar energy to combine molecules of carbon dioxide and water into complex, energy rich organic compounds. **Planet Earth Show**

Grades 9-12: The Molecular Basis of Heredity

In all organisms, the instructions for specifying the characteristics of the organism are carried in DNA. **DNA**

Grades 9-12: The Interdependence of Organisms

The atoms and molecules on the earth cycle among the living and nonliving components of the biosphere. **Carbon Cycle, Planet Earth Show**

Energy flows through ecosystems in one direction, from photosynthetic organisms to herbivores to carnivores and decomposers. **Planet Earth Show:**

Human beings live within the world's ecosystems. Increasingly, humans modify ecosystems as a result of population growth, technology, and consumption. **Planet Earth Show, Greenhouse Effect, Carbon Cycle, Global Emissions**

Grades 9-12: Geochemical Cycles

The earth is a system containing essentially a fixed amount of each stable chemical atom or element. Each element can exist in several different chemical reservoirs. Each element on earth moves among reservoirs in the solid earth, oceans, atmosphere, and organisms as part of geochemical cycles. **Carbon Cycle, Planet Earth Show**

Movement of matter between reservoirs is driven by earth's internal and external sources of energy. These movements are often accompanied by a change in the physical and chemical properties of the matter. Carbon, for example, occurs in carbonate rocks such as limestone, in the atmosphere as carbon dioxide gas, in water dissolved as carbon dioxide, and in all organisms as complex molecules that control the chemistry of life. **Carbon Cycle, Planet Earth Show**

Grades 9-12: Environmental Quality

Natural ecosystems provide an array of basic processes that affect humans. Those processes include maintenance of the quality of the atmosphere, generation of soils, control of the hydrologic cycle, disposal of wastes, and recycling of nutrients. Humans are changing many of these basic processes, and the changes may be detrimental to humans. **Global Emissions, Greenhouse Effect, Planet Earth Show, Carbon Cycle**

Materials from human societies affect both physical and chemical cycles of the earth. **Global Emissions, Greenhouse Effect, Planet Earth Show, Carbon Cycle**