

Virginia Standards of Learning Covered in the Trees to Products Program

Science:

Living Systems

- 2.5 The student will investigate and understand that living things are part of a system. Key concepts include
- living organisms are interdependent with their living and nonliving surroundings; and
 - habitats change over time due to many influences.

Resources

- 2.8 The student will investigate and understand that plants produce oxygen and food, are a source of useful products, and provide benefits in nature. Key concepts include
- important plant products (fiber, cotton, oil, spices, lumber, rubber, medicines, and paper);
 - the availability of plant products affects the development of a geographic area; and
 - plants provide homes and food for many animals and prevent soil from washing away.

Living Systems

- 3.6 The student will investigate and understand that environments support a diversity of plants and animals that share limited resources. Key concepts include
- water-related environments (pond, marshland, swamp, stream, river, and ocean environments);
 - dry-land environments (desert, grassland, rain forest, and forest environments); and
 - population and community.

Resources

- 3.10 The student will investigate and understand that natural events and human influences can affect the survival of species. Key concepts include
- the interdependency of plants and animals;
 - the effects of human activity on the quality of air, water, and habitat;
 - the effects of fire, flood, disease, and erosion on organisms; and
 - conservation and resource renewal.
- 3.11 The student will investigate and understand different sources of energy. Key concepts include
- the sun's ability to produce light and heat energy;
 - sources of energy (sunlight, water, wind);
 - fossil fuels (coal, oil, natural gas) and wood; and
 - renewable and nonrenewable energy resources.

Living Systems

- 4.5 The student will investigate and understand how plants and animals in an ecosystem interact with one another and the nonliving environment. Key concepts include
- behavioral and structural adaptations;
 - organization of communities;
 - flow of energy through food webs;
 - habitats and niches;
 - life cycles; and
 - influence of human activity on ecosystems.

Resources

- 4.8 The student will investigate and understand important Virginia natural resources. Key concepts include

- a) watershed and water resources;
- b) animals and plants;
- c) minerals, rocks, ores, and energy sources; and
- d) forests, soil, and land.

Resources

- 6.9 The student will investigate and understand public policy decisions relating to the environment. Key concepts include
- a) management of renewable resources (water, air, soil, plant life, animal life);
 - b) management of nonrenewable resources (coal, oil, natural gas, nuclear power, mineral resources);
 - c) the mitigation of land-use and environmental hazards through preventive measures; and
 - d) cost/benefit tradeoffs in conservation policies.

Life Science

- LS.3 The student will investigate and understand that living things show patterns of cellular organization. Key concepts include
- b) life functions and processes of cells, tissues, organs, and systems (respiration, removal of wastes, growth, reproduction, digestion, and cellular transport).
- LS.4 The student will investigate and understand that the basic needs of organisms must be met in order to carry out life processes. Key concepts include
- a) plant needs (light, water, gases, and nutrients);
 - b) animal needs (food, water, gases, shelter, space); and
- LS.5 The student will investigate and understand how organisms can be classified. Key concepts include
- a) the distinguishing characteristics of kingdoms of organisms;
 - b) the distinguishing characteristics of major animal and plant phyla; and
 - c) the characteristics of the species.
- LS.6 The student will investigate and understand the basic physical and chemical processes of photosynthesis and its importance to plant and animal life. Key concepts include
- a) energy transfer between sunlight and chlorophyll;
 - b) transformation of water and carbon dioxide into sugar and oxygen; and
 - c) photosynthesis as the foundation of virtually all food webs.
- LS.7 The student will investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment. Key concepts include
- a) the carbon, water, and nitrogen cycles;
 - b) interactions resulting in a flow of energy and matter throughout the system;
 - c) complex relationships within terrestrial, freshwater, and marine ecosystems; and
 - d) energy flow in food webs and energy pyramids.
- LS.11 The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic and change over time (daily, seasonal, and long term). Key concepts include
- a) phototropism, hibernation, and dormancy;
 - b) factors that increase or decrease population size; and
 - c) eutrophication, climate changes, and catastrophic disturbances.

LS.12 The student will investigate and understand the relationships between ecosystem dynamics and human activity.

Key concepts include

- a) food production and harvest;
- b) change in habitat size, quality, or structure;
- c) change in species competition;
- d) population disturbances and factors that threaten or enhance species survival; and
- e) environmental issues (water supply, air quality, energy production, and waste management).

Biology

BIO.9 The student will investigate and understand dynamic equilibria within populations, communities, and ecosystems.

Key concepts include

- a) interactions within and among populations including carrying capacities, limiting factors, and growth curves;
- b) nutrient cycling with energy flow through ecosystems;
- c) succession patterns in ecosystems;
- d) the effects of natural events and human activities on ecosystems; and

Social Studies:

History

2.3 The student will identify and compare changes in community life over time in terms of buildings, jobs, transportation, and population.

Economics

2.7 The student will describe the differences between natural resources (water, soil, wood, and coal), human resources (people at work), and capital resources (machines, tools, and buildings).

2.8 The student will distinguish between the use of barter and money in the exchange for goods and services.

2.9 The student will explain that scarcity (limited resources) requires people to make choices about producing and consuming goods and services.

Economics

3.7 The student will explain how producers use natural resources (water, soil, wood, and coal), human resources (people at work), and capital resources (machines, tools, and buildings) to produce goods and services for consumers.

3.8 The student will recognize the concepts of specialization (being an expert in one job, product, or service) and interdependence (depending on others) in the production of goods and services (in ancient Greece, Rome, the West African empire of Mali, and in the present).

3.9 The student will identify examples of making an economic choice and will explain the idea of opportunity cost (what is given up when making a choice).

VS.10 The student will demonstrate knowledge of government, geography, and economics by

- b) describing the major products and industries of Virginia's five geographic regions;
- c) explaining how advances in transportation, communications, and technology have contributed to Virginia's prosperity and role in the global economy.