Unit 1: Resources

Pa State Standards:
Standard 3.5
Earth Sciences:
3.5.7 B
Recognize earth resources and how they affect everyday life.
- Identify and locate significant earth resources (e.g., rock types, oil, gas, coal deposits) in Pennsylvania.
- Explain the processes involved in the formation of oil and coal in Pennsylvania.
- Explain the value and uses of different earth resources (e.g., selected minerals, ores, fuel sources, agricultural uses).

3.5.10 B
Explain sources and uses of earth resources.
- Demonstrate the effects of sedimentation and erosion before and after a conservation plan is implemented.
- Evaluate land use (e.g., agricultural, recreational, residential, commercial) in Pennsylvania based upon soil characteristics.

3.5.7 D
Explain the behavior and impact of the earth’s water systems.
- Explain the water cycle using the processes of evaporation and condensation.
- Describe factors that affect evaporation and condensation.
- Distinguish salt from fresh water (e.g., density, electrical conduction).
- Compare the effect of water type (e.g., polluted, fresh, salt water) and the life contained in them.

3.5.10 D
Assess the value of water as a resource.
- Compare specific sources of potable water (e.g., wells, public systems, rivers) used by people in Pennsylvania.
- Identify the components of a municipal/agricultural water supply system and a wastewater treatment system.
- Relate aquatic life to water conditions (e.g., turbidity, temperature, salinity, dissolved oxygen, nitrogen levels, pressure).
- Compare commercially important aquatic species in or near Pennsylvania.
- Identify economic resources found in marine areas.
Assess the natural and man-made factors that affect the availability of clean water (e.g., rock and mineral deposits, man-made pollution).

3.5.12 D
Analyze the principles and history of hydrology.
- Analyze the operation and effectiveness of a water purification and desalination system.
- Evaluate the pros and cons of surface water appropriation for commercial and electrical use.
- Analyze the historical development of water use in Pennsylvania (e.g., recovery of Lake Erie).
Environment and Ecology Standards

4.2 Renewable and Non-renewable Resources

4.2.7 A
Know that raw materials come from natural resources.
- Identify resources used to provide humans with energy, food, housing and water.
- Explain how plants and animals may be classified as natural resources.
- Compare means of growing or acquiring food.
- Identify types of minerals and fossil fuels used by humans.

4.2.10 A
Explain that renewable and nonrenewable resources supply energy and materials.
- Identify alternative sources of energy.
- Identify and compare fuels used in industrial and agricultural societies.
- Compare and contrast the cycles of various natural resources.
- Explain food and fiber as renewable resources.

4.2.12 A
Analyze the use of renewable and nonrenewable resources.
- Explain the effects on the environment and sustainability through the use of nonrenewable resources.
- Evaluate the advantages and disadvantages of reusing our natural resources.

4.2.7 B
Examine the renewability of resources.
- Identify renewable resources and describe their uses.
- Identify nonrenewable resources and describe their uses.
- Compare finished products to their original raw material.
- Identify the waste derived from the use of renewable and nonrenewable resources.
- Determine how consumption may impact the availability of resources.
- Compare the time spans of renewability for fossil fuels and alternative fuels.

4.2.10 B
Evaluate factors affecting availability of natural resources.
- Describe natural occurrences that may affect the natural resources.
- Analyze technologies that affect the use of our natural resources.
- Evaluate the effect of consumer desires on various natural resources.

4.2.10 B
Analyze factors affecting the availability of renewable and nonrenewable resources.
- Evaluate the use of natural resources and offer approaches for using them while diminishing waste.

4.2.7 D
Describe the role of recycling and waste management.
- Identify materials that can be recycled in the community.
- Explain the process of closing the loop in recycling.
- Compare the decomposition rates of different organic materials.
- Describe methods that could be used to reuse materials for new products.
- Evaluate the costs and benefits of disposable products.

4.2.10 D
Explain different management alternatives involved in recycling and solid waste management.
• Analyze the manufacturing process (before, during and after) with consideration for resource recovery.
• Compare various methods dealing with solid waste (e.g., incineration, compost, land application).
• Differentiate between pre/post-consumer and raw materials.
• Illustrate how one natural resource can be managed through reduction, recycling, reuse or use.

4.2.12 D
Evaluate solid waste management practices.
• Examine and explain the path of a recyclable material from collection to waste, reuse or recycling identifying the market forces.
• Understand current regulations concerning recycling and solid waste.
• Research new technologies in the use, reuse or recycling of materials.

4.8 Humans and the Environment
4.8.10 A
Analyze how society’s needs relate to the sustainability of natural resources.
• Explain why some societies have been unable to meet their natural resource needs.
• Compare and contrast the use of natural resources and the environmental conditions in several countries.
• Describe how uses of natural resources impact sustainability.

**Students will be able to:**
- Trace materials through biogeochemical cycles (water, carbon, nitrogen)
- Explain how humans have altered biogeochemical cycles.
- Describe the composition of soil (biotic and abiotic components)
- Explain strategies for soil conservation and what effects not following these conservation practices may have.
- Classify soil types
- Differentiate between renewable and nonrenewable resources
- Evaluate ways to reduce waste (R, R, R)
- Describe the formation of fossil fuels
- Explain uses of fossil fuels
- Identify alternative sources of energy (wind, solar, geothermal, nuclear, biofuels)
- Evaluate various methods of waste disposal
- Identify what living resources are used for food and what advantages there are for “eating locally” and organic foods.
- Describe how wastewater is treated
- Explain why water is a resource and how/why it is conserved

**Suggested Activities:**
- Internet Activities- Biogeochemical cycles review, Fossil Fuels Review, Alternative Fuels Webquest, Water Treatment Webquest
- Soil Classification Lab
- Testing soil samples for nutrients
- Formation of Fossil Fuels Activity
- Decomposition Lab
- Clean the Water Lab