Chapter 4: Natural Resources

Lesson 1: Energy Resources

Essential Questions:

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| 1. What are the main sources of nonrenewable energy? | The main sources of nonrenewable energy are fossil fuels such as coal and oil, and uranium. |
| 2. What are the advantages and disadvantages of using nonrenewable energy resources? | The advantages of using nonrenewable energy resources are:  1. burning fossil fuels to make electricity is fairly easy and simple,  2. they are relatively inexpensive and easy to transport, (coal is often transported by trains, oil by pipelines or large ships called tankers)  The disadvantages of using nonrenewable energy resources are:  1. Limited supply: they will run out some day, oil reserves will only last another 50 years.  2. Habitat destruction: extracting them from the Earth destroys and disturbs environments.  Coal comes from strip mines or underground  mines.  Oil and natural gas come from wells drilled into Earth.  Forests can be fragmented.  Pollution: runoff from coal mines pollute water and soil,  Oil spills from tankers or pipelines can also pollute water and soil.  Burning fossil fuels increases chemicals in the atmosphere producing greenhouse gasses that cause global warming. Pollutes water and the atmosphere. |
| 3. How can individuals help manage nonrenewable resources wisely? |  |
| Key Terms |  |
| Nonrenewable resources | Resources that are used faster than they can be replaced by natural processes. Fossil fuels, such as coal and oil, and uranium, which is used in nuclear reactions, are nonrenewable energy resources. |
| Fossil fuels | Coal, oil, also called petroleum, and natural gas are fossil fuels.  The type of fossil fuel that formed depended on three factors:  1. the type of organic matter  2. the temperature and pressure  3. the length of time the organic matter was buried |
| Coal | Formed millions of years ago.  The type of organic matter that coal is made up of are plants, such as ferns and trees that grew in prehistoric swamps.  First these plants died,  Then bacteria, extreme temperatures, and pressure acted on the plant remains over time. This changed the material to form peat. Over time peat can eventually change into harder and harder types of coal. Coal can be burned to heat homes or to produce energy in power plants. |
| Oil and natural gas | Formed millions of years ago.  The type of organic matter that oil and natural gas are made up of are the remains of microscopic marine organisms called plankton.  First these organisms died and fell on the ocean floor,  Then layers of sediment buried their remains,  Then bacteria decomposed them,  Then pressure and extreme temperatures acted on the sediment,  Then thick, liquid oil formed first,  If the temperature and pressure were great enough, natural gas was formed. |
| Renewable resource | Resources that can be replaced by natural processes in a relatively short amount of time. The Sun’s energy, also called solar energy, is a renewable energy resource. |
| Nuclear energy | Energy released from atomic reactions.  Stars (sun) releases energy by fusing atoms.  Nuclear power plants produce electricity using nuclear fission.  This process involves neutrons shot at fuel rods containing uranium atoms which splits the atoms and releases thermal energy, the chain reaction of neutrons being hit and releasing thermal energy  is used to heat water to create steam which turns a turbine connected to a generator to produce electricity. |
| Advantages and disadvantages of nuclear energy | Advantages:  A relatively small amount of uranium produces a large amount of energy.  A well-run nuclear power plant does not pollute the air, the soil, or the water.  Disadvantages:  Uranium is nonrenewable,  If the nuclear reaction gets out of control, it can lead to a release of harmful radioactive substances into the environment.  The waste materials are highly hazardous and storing them safely remains to be problematic. |
| Reclamation | A process in which mined land must be recovered with soil and replanted with vegetation |
| Vampire energy | Unplug! |