Energy Resources

Fossil Fuels Renewable Sources of Energy Nuclear Energy Energy Conservation

Fossil Fuels

How do fuels provide energy?

- When fuels are burned, the chemical energy that is released can be used to generate another form of energy, such as heat, light, motion, or electricity.
 - Fuel-a substance that provides energy
 - \circ ~ Energy transformation-a change from one form of energy to another
 - Combustion-burning of fuel

Fossil Fuels

What are the three major fossil fuels?

- The three major fossil fuels are coal, oil, and natural gas.
 - Fossil fuel-energy-rich substances formed from the remains of organisms
 - Hydrocarbon-chemical compounds that contain carbon and hydrogen atoms
 - Petroleum-another name for oil
 - Refinery-a factory in which crude oil is heated and separated into fuels and other products
 - \circ \qquad Petrochemicals-compounds that are made from oil

Fossil Fuels

Why are fossil fuels considered nonrenewable?

• Since fossil fuels take hundreds of millions of years to form, they are considered nonrenewable resources.

Renewable Sources of Energy

What forms of energy does the sun provide?

- The sun constantly gives off energy in the forms of light and heat.
 - Solar energy-energy from the sun

Renewable Sources of Energy

What are some renewable sources of energy?

- Other renewable sources of energy include water, the wind, biomass fuels, geothermal energy, and hydrogen.
 - Hydroelectric power-electricity produced by flowing water
 - Biomass fuels-fuels made from living things
 - Gasohol-alcohol added to gasoline
 - Geothermal energy-the intense heat from Earth's interior that warms the magma

Nuclear Energy

What happens during a nuclear fission reaction?

- When the neutron hits the U-235 nucleus, the nucleus splits apart into two smaller nuclei and two or more neutrons.
 - Nucleus-the central core of an atom that contains the protons and neutrons
 - Nuclear fission-the splitting of an atom's nucleus into two smaller nuclei

Nuclear Energy

How does a nuclear power plant produce electricity?

- In a nuclear power plant, the heat released from fission reactions is used to change water into steam. The steam then turns the blades of a turbine to generate electricity.
 - \circ ~ Reactor vessel-the part of the nuclear reactor where nuclear fission occurs
 - Fuel rods-rods of U-235
 - Control rods-rods made of the metal cadmium that are inserted between the fuel rods to slow the nuclear reaction down
 - Meltdown-when the fuel rods generate so much heat the rods start to melt

Nuclear Energy

How does a nuclear fusion reaction occur?

- In nuclear fusion, two hydrogen nuclei combine to create a helium nucleus, which has slightly less mass than the two hydrogen nuclei. The lost mass is converted to energy.
 - Nuclear fusion-the combining of two atomic nuclei to produce a single larger nucleus

Energy Conservation

What are two ways to preserve our current energy sources?

- One way to preserve our current energy resources is to increase the efficiency of our energy use. Another way is to conserve energy whenever possible.
 - Efficiency-the percentage of energy that is actually used to perform work
 - Insulation-a layer of material that traps air to help block the transfer of heat between the air inside and outside a building
 - Energy conservation-reducing energy use