

Chapter 25

REINFORCEMENT

● Fossil Fuels

Complete the table below by placing a check mark (✓) beneath the headings of the substances that have each characteristic described in the first column.

| Characteristic | Petroleum | Natural Gas | Coal |
|---|-----------|-------------|------|
| 1. is a fossil fuel | | | |
| 2. forms from plants and animals | | | |
| 3. forms only from plants | | | |
| 4. is a solid | | | |
| 5. is a liquid | | | |
| 6. is a gas | | | |
| 7. is made up of hydrocarbons | | | |
| 8. is a source of energy | | | |
| 9. is a nonrenewable resource | | | |
| 10. is pumped from wells | | | |
| 11. is separated using fractional distillation | | | |
| 12. is also called crude oil | | | |
| 13. is transported long distances through pipes | | | |
| 14. is mined from Earth | | | |
| 15. produces polluting substances when burned | | | |
| 16. produces thermal energy when burned | | | |
| 17. can be used to produce electricity | | | |
| 18. is the least polluting fossil fuel | | | |

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● Nuclear Energy

Place the following events describing the production of electrical energy from a nuclear fission reactor in the correct order. Write the numbers 1 (first) through 7 (last) in the spaces provided.

- _____ a. Steam produced by boiling water causes the blades of a turbine to rotate.
- _____ b. A neutron bombards a uranium-235 isotope.
- _____ c. Thermal energy released by the reaction is added to water.
- _____ d. Electricity from the generator is carried to the community through wires.
- _____ e. A uranium-235 atom splits, producing two atoms with smaller nuclei, three neutrons, and thermal energy.
- _____ f. The mechanical energy of the rotating turbine blades is transferred to an electric generator.
- _____ g. Superheated water passes through a heat exchanger, where the thermal energy released boils a separate system of water to produce steam.

Answer the following questions about nuclear energy.

1. How does using nuclear energy harm the environment? _____

2. How is using nuclear energy less harmful to the environment than using fossil fuels?

3. How does the half-life of a radioactive waste affect the type of container in which the waste will be stored? _____

4. Why is nuclear fusion not currently used as an energy source on Earth? _____

5. How do the products of a fusion reaction differ from the products of a fission reaction?

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● Nuclear Waste and NIMBY

Circle the term or phrase in the parentheses that makes each statement true.

1. At present, proposals are being investigated to store high-level nuclear wastes in containers placed in (dried-up river beds, underground rock deposits).
2. The spent fuel from a nuclear reactor must be stored because it is (low-level, high-level) nuclear waste.
3. At present, military nuclear wastes are stored in (a single location, several locations) in the United States.
4. One reason spent fuel rods must be disposed of in durable containers is that they contain material with (very short, very long) half-lives.
5. Low-level nuclear wastes from medical processes are usually disposed of by being (buried in special landfills, burned).
6. Nuclear wastes are (radioactive by-products, unused nuclear materials) that remain after radioactive materials are used.
7. At present, a national storage site for high-level nuclear wastes has been seriously proposed near (Oak Ridge, Tennessee; Yucca Mountain, Nevada).
8. One recent proposal involved in disposing of nuclear wastes is to (seal them in ceramic glass globules, mix them with salt deposits).
9. The point of view that nuclear wastes should be stored but not in their immediate area is known as (NWPA, NIMBY).
10. If no new radioactive wastes were generated from today on, the problem of storage would (be eliminated, still remain).
11. One reason the federal government wants to establish a national, permanent storage site is that (some temporary sites have shown leakage, transportation problems would be reduced).

In the space provided, answer the following questions about a single, national, underground storage site.

12. What questions need to be answered before selecting a site? _____

13. What are the main points in favor of such a site? _____

Chapter 25**REINFORCEMENT****● Alternative Energy Sources**

Provide the information requested for each alternative energy source listed.

1. Biomasses

- a. What is biomass? _____
b. How is biomass used? _____

2. Solar energy

- a. What is solar energy? _____
b. What is passive solar heating? _____

- c. What is a photovoltaic cell? _____

3. Hydroelectricity

- a. What is hydroelectricity? _____

- b. What is one economic advantage to hydroelectricity? _____

4. Tidal energy

- a. What is tidal energy? _____
b. Why is tidal energy a limited source of energy? _____

5. Wind energy

- a. What device is used to harness the energy in wind and convert it into electricity?

- b. Why is the wind an energy source with limited uses? _____

6. Geothermal energy

- a. What is geothermal energy? _____

- b. Where is geothermal energy used as a primary energy source? _____