

APES Unit 6 Study Guide

Ultimate Review Packet (6.1 - 6.3)

6.1 - Renewable and Nonrenewable Energy

- a. Define what a renewable energy source is and provide an example
- b. Define what a nonrenewable energy source is and provide an example
- c. **Identify** and **describe** a potentially renewable energy source

6.2 - Global Energy Consumption

- a. Define subsistence fuel and **describe** why these fuels are more utilized in less developed nations
- b. **Explain** why developed nations have higher per capita energy consumption than less developed nations
- c. **Describe** how the global use of fossil fuels as an energy source compares to other sources
- d. **Identify** a factor that influences use of an energy source and **describe** how a change in that factor would impact use

6.3 - Fuel Types and Uses

- a. **Describe** the difference between wood and charcoal and **identify** a use for either
- b. **Describe** the formation of peat
- c. **Explain** how peat can become anthracite coal, **identifying** intermediate coal forms in the process
- d. **Describe** the composition and extraction of petroleum
- e. **Describe** the process of fractional distillation and identify TWO end uses for petroleum

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6.3 - Fuel Types and Uses (cont.)

- f. **Describe** how the extraction of petroleum from oil sands/tar sands differs from traditional petroleum extraction
- g. **Explain** TWO reasons that natural gas is considered a “cleaner” fossil fuel than coal

6.4 - Distribution of Natural Energy Resources

- a. Rank the three fossil fuels in terms of their estimated remaining reserves from greatest to least
- b. **Identify** a region on earth that contains one of the largest known tar sands petroleum deposits
- c. **Describe** the geological characteristics associated with petroleum and natural gas deposits

6.5 - Fossil Fuels

- a. Draw out the basic products and reactants in the combustion of methane (CH_4) and **Identify** the purpose of this reaction
- b. Draw out a diagram to represent the basic steps of producing electricity from fossil fuels
- c. **Explain** the process of using fossil fuels to generate electricity
- d. **Describe** the benefits and drawbacks of each of fossil fuel below

Coal:	Petroleum/crude oil:	Natural gas:

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6.5 - Fossil Fuels (cont.)

- a. **Describe** the process of natural gas extraction via fracking
- b. **Describe** a water-related environmental consequence of fracking
- c. **Describe** a non water-related environmental consequence of fracking
- d. **Identify** THREE components of fracking flowback fluid

6.6 - Nuclear Energy

- a. **Explain** the process of a fission reaction
- b. **Explain** how nuclear energy can be used to generate electricity
- c. **Describe** an environmental advantage and disadvantage of nuclear energy compared to fossil fuels
- d. Provide a brief **description** of each of the three largest nuclear meltdowns in history

6.7 - Biomass

- a. **Identify** an environmental and human health consequence of using wood as a fuel source
- b. **Identify** the most common biofuel and **describe** its production and use
- c. **Explain** why ethanol combustion is considered carbon-neutral
- d. **Describe** an environmental benefit of ethanol and an economic drawback of ethanol

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6.8 - Solar Energy

- a. **Explain** the difference between active and passive solar energy
- b. **Explain** the difference between the use of photovoltaic cells and concentrated solar thermal electricity generation
- c. **Describe** TWO environmental benefits of solar energy compared to fossil fuels
- d. **Identify** one environmental and one economic drawback of solar energy

6.9 - Hydroelectric Power

- a. Draw a diagram to show how water impoundment systems or hydroelectric dams are used to generate electricity and describe how water buildup behind the dam contributes increases electricity output
- b. **Explain** how hydroelectricity is generated using the terms kinetic, mechanical, and electrical energy
- c. **Describe** how run of river and tidal energy systems differ from water impoundment systems
- d. **Describe** an environmental advantage and disadvantage of hydroelectric dams
- e. **Describe** an economic advantage and disadvantage of hydroelectric dams

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6.10 - Geothermal Energy

- a. **Describe** how geothermal energy can be used to produce electricity

- b. **Describe** an environmental and economic benefit of geothermal energy

- c. **Identify** an economic and human health drawback of geothermal energy

6.11 - Hydrogen Fuel Cell

- a. **Identify** the inputs and outputs of a Hydrogen Fuel Cell

- b. **Describe** how electricity is generated with a hydrogen fuel cell

- c. **Explain** how the use of a hydrogen fuel cell may still result in carbon emissions, even though the only waste product of the reaction in the cell is water

- d. **Identify** a drawback and benefit of hydrogen fuel cell vehicles

6.12 - Wind Energy

- a. **Explain** the process of generating electricity using wind turbines

- b. **Describe** TWO environmental advantages of wind turbines

- c. **Identify** one environmental and one economic drawback of wind turbines

6.13 - Energy Conservation

- a. **Identify** TWO methods of reducing electricity use at home

- b. **Identify** TWO methods of conserving energy used in heating/cooling a home

- c. **Identify** TWO methods of water conservation at home

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6.13 - Energy Conservation (cont.)

- d. **Describe** how a green roof can reduce the energy use of a building

- e. **Identify** TWO individual-scale methods and TWO government-scale methods to reduce energy used for transportation