**(AP) ENVIRONMENTAL SCIENCE 2022-23 December 1, 2022**

**Today’s Agenda (Day 62)**

1. Housekeeping Items

🡪 BRING: yeast, molasses, dried beans

1. Homework Check:

🡪 Ecological Footprint Calculator Activity

🡪 Chapter 8 & 9 Vocabulary

🡪 Chapter 8 Reading Guide

1. Class Activity:

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🡪DAY 4: Chapter 8 PPT Review

1. **Section 8.3 – Electrical Energy**
2. **Section 8.4 – The economics and politics of energy use**
3. Section 8.5 – Energy consumption trends

🡪BEGIN: Chapter 9 PPT Review

1. **Section 9.1 -** Major Energy Sources
2. Section 9.2 - Resources and Reserves
3. Section 9.3 - Fossil-Fuel Formation
4. Section 9.4 - Issues Related to the Use of Fossil Fuels
5. Section 9.5 - Nuclear Power

HOMEWORK:

* READ: Chapter 8 – Energy and Civilization: Patterns of Consumption
* COMPLETE: Chapter 9 Reading Guide
* **STUDY**: Chapter 8 – 9 Vocabulary and Ch 8 Test

Chapter 8 & 9 Vocabulary

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| Absorbed dose | Acid mine drainage | Alpha radiation | Anthracite | Beta radiation | Bituminous |
| Black lung disease | Coal | Crude oil | Dose equivalent | Fissionable | Fossil fuels |
| Gamma radiation | Hydraulic fracturing (fracking) | Industrial Revolution | Ionizing radiation | Lignite | Liquified natural gas |
| Mountaintop removal | Natural gas | Non-renewable energy sources | Nuclear chain reaction | Nuclear fission | Nuclear reactor |
| Oil shale | Open pit mining  | Ore | Overburden | Peat  | Petrochemicals |
| Petroleum (crude oil) | Plutonium-239 | Radiation | Radioactive | Radioactive half-life | Renewable energy sources  |
| Reserves  | Resource | Smelting | Spoils | Strip mining | Surface mining |
| Tar sands | Underground mining | Uranium-235 |  |  |  |

REMINDER

* **TEST: Ch 8** 🡪 **Dec. 2**
* **QUIZ: Ch 8 and 9 Vocabulary – Dec. 6**
* Chapter 9 Reading Guide – Dec. 7
* **MIDTERM EXAM: Ch 1 - 9**

**(AP) ENVIRONMENTAL SCIENCE 2022-23 READING GUIDECHAPTER 8**

REVIEW QUESTIONS

1. How did the domestication of animals change energy use in early cultures?

2. In addition to food, what energy requirements does a civilization have?

3. How was the availability of coal important in determining if a country participated in the Industrial Revolution?

4. What factors caused a shift from wood to coal as a source of energy?

5. What major factor caused a shift to the use of oil as a source of energy?

6. Describe two factors that have led to the dominance of automobiles as a form of transportation in the United States.

7. Describe two actions governments take that cause changes in how citizens use energy.

8. What advantages does electrical energy have over other kinds of energy?

9. State two reasons the cost of electricity differs from one country to another.

10. List the three primary categories of energy use in industrialized societies.

11. Why is OPEC important in the world’s economy?

12. Give examples of how political and economic events affect energy prices and usage.

13. Based on current trends, what is likely to happen to the availability and price of energy in the next ten years?

CRITICAL THINKING QUESTIONS [for APES students only]

1. Imagine you are a historian writing about the Industrial Revolution. Imagine that you also have your new knowledge of environmental science and its perspective. What kind of a story would you tell about the development of industry in Europe and the United States? Would it be a story of triumph or tragedy, or some other story? Why?

2. What might be some of the effects of raising gasoline taxes in the United States to the rate that most Europeans pay for gasoline? Why? What do you think about this possibility?

3. Some argue that the price of gasoline in the United States is artificially low because it does not take into account all of the costs of producing and using gasoline. If you were to figure out the “true” cost of gasoline, what kinds of factors would you want to consider?

 4. How has the ubiquitous nature of automobiles changed the United States? Do you feel these changes are, on balance, positive or negative? What should the future look like regarding automobile use in the United States? How can this be accomplished?

5. The Organization of Petroleum Exporting Countries (OPEC) controls over 70 percent of the known oil reserves. What political and economic effects do you think this has? Does this have any effect on energy use?

6. How do you think projected energy consumption will affect world politics and economics, given current concerns about global warming?

**(AP) ENVIRONMENTAL SCIENCE 2022-23 READING GUIDECHAPTER 9**

REVIEW QUESTIONS

1. Name the three most important sources of energy.

2. Distinguish between reserves and resources.

3. Describe three factors that can cause the amount of an oil reserve to increase.

4. Describe the geologic processes that resulted in the formation of coal.

5. Describe the differences between lignite, bituminous, and anthracite coal.

6. Describe the processes that resulted in the formation of oil and natural gas.

7. What regions of the world have the largest reserves of coal? Of oil? Of natural gas?

8. List three environmental impacts of the use of coal.

9. What are secondary and tertiary oil recovery methods? Why is their use related to the price of oil?

10. What is the most common environmental problem associated with the extraction and transportation of oil? 11. What environmental advantage does natural gas have over oil and coal?

12. What environmental concern has caused people to be more accepting of nuclear power?

13. What are the products of the nuclear disintegration of a radioactive isotope?

14. What is a nuclear chain reaction?

15. Describe how a nuclear power plant generates electricity.

16. Name the steps in the nuclear fuel cycle.

17. How does radiation cause damage to organisms?

18. List the three primary methods of protecting people from damaging radiation.

19. What happened at Chernobyl, Three Mile Island, and Fukushima? Why did it happen?

20. What are the major environmental problems associated with the use of nuclear power?

21. What happens during Stage 1 of the decommissioning of a nuclear power plant?

22. What options are available during Stage 2 of the decommissioning of a nuclear power plant?

CRITICAL THINKING QUESTIONS [for APES students only]

1. Coal-burning electric power plants in the Midwest have contributed to acid rain in the eastern United States. Other energy sources would most likely be costlier than coal, thereby raising electricity rates. Should citizens in eastern states be able to pressure utility companies in the Midwest to change the method of generating electricity? What mechanisms might be available to make these changes? How effective are these mechanisms?

2. Recent concerns about global warming have begun to revive the nuclear industry in the United States. Do you think nuclear power should be used instead of coal for generating electricity? Why?

3. Some states allow consumers to choose an electric supplier. Would you choose an alternative to nuclear or coal even if it cost more?

4. Given what you know about the economic and environmental costs of different energy sources, would you recommend that your local utility company use nuclear power or coal to supplement electric production? What criteria would you use to make your recommendation?