**(AP) ENVIRONMENTAL SCIENCE 2022-23 December 8, 2022**

**Today’s Agenda (Day 68)**

1. Housekeeping Items

🡪 BRING:

1. Homework Check:

🡪 Chapter 9 Reading Guide

1. Class Activity:

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🡪DAY 3: Chapter 9 PPT Review

1. **Section 9.5 - Nuclear Power**
2. **Section 9.6 – The Nature of Nuclear Energy**
3. Section 9.7 – Nuclear Chain Reaction
4. Section 9.8 – Nuclear Fission Reactors
5. Section 9.9- Nuclear Fuel Cycle
6. Section 9.10 – Issues Related to the Use of Nuclear Fuels

HOMEWORK:

* READ: Chapter 9 – Energy and Civilization: Patterns of Consumption
* COMPLETE:
* **STUDY**: Mid-term Exam [Ch 1 – 9]

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

* **MIDTERM EXAM: Ch 1 – 9 🡪 December 15, 8:30 am**

**(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?