Name: _____ Period: _____ Date: _____

Environmental Science Study Guide

Nonrenewable Energy

Critical Thinking

Be able to read, analyze, and give complete answers to questions like these.

1. Give a basic explanation of how electricity is generated, using coal as an example fuel. Use the words **turbine** and **generator** in the description.

2. Rank worldwide commercial energy use from greatest to least for each of these sources: coal, oil, natural gas, hydroelectric, nuclear.

3. Compare the energy use of an average person in a developed country (such as the U.S.) and a developing country.

4. Why is electricity generation so inefficient? List three places that energy is lost as it is converted to electricity and sent to the consumer.

5. What power plants are found in this county?

6. Why are coal, oil, and natural gas called "fossil fuels"?

7. Complete this table to summarize characteristics of the three fossil fuels.

	What is it made of?	Common way it is used	How much is left?	Where in the world are most of the supplies?	Advantage of using this fossil fuel?	Disadvantage of using this fossil fuel?
Coal						
Oil						
Natural Gas						

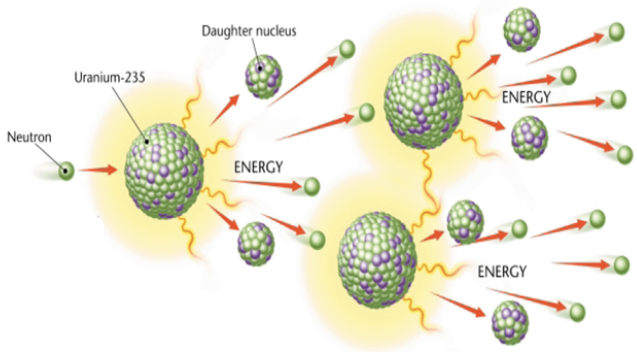
8. What was nuclear technology initially developed for?

9. Explain the "Castle Bravo" incident, its effects, and the resulting scandal.

10. What did the countries that signed the **Partial Test Ban Treaty of 1963** stop doing?

11. Give examples of short-term and long-term effects of high levels of radiation exposure.

12. Explain the process of **nuclear fission**, using the diagram below.



13. Give a basic explanation of how a nuclear reactor is designed. Use the words **uranium-235, fuel rod, fuel assembly, reactor core, moderator,** and **control rods** in your description.

14. What shape do the modern containment vessels of nuclear reactors have? Why?

15. What effect did the Three Mile Island partial meltdown of 1979 and the movie "China Syndrome" have on the public's perception of the safety of nuclear reactors?

16. The Chernobyl meltdown of 1986 occurred due to a flaw in the reactor design. What was the flaw?

17. Who received most of the blame for the Chernobyl meltdown? Was this blame accurately placed?

18. What is a radioactive **half-life**?

19. Cesium-137, a nuclear waste product, has a half-life of about 30 years. Assuming that 10kg of cesium-137 is present, how long in years and half-lives will it take to have less than 1kg left?

20. Where is the high-level nuclear waste currently being stored?

21. Why did the federal government want to store the nuclear waste at Yucca Mountain?