

## Environmental Resources Final Study Guide

### Chapter 11, Water

1. Define the water cycle:

**THE CONTINUOUS MOVEMENT OF WATER BETWEEN THE ATMOSPHERE, LAND, & OCEANS.**

2. Define surface water:

**I.E. RIVERS, STREAMS, LAKES, PONDS, ETC.**

3. **Remember salt water contributes to more than 97% of all the water on earth, and that fresh water is such a limited resource.** Knowing that, where does most of Earth's surface water come from?

**POLAR ICE CAPS**

4. Define ground water:

**AQUIFER**

5. What is the relationship between groundwater and surface water?

**SURFACE WATER PERCOLATES (SOAKS) INTO THE SOIL, RECHARGING AQUIFERS & THEN BECOMING GROUNDWATER.**

6. How is most of the freshwater used worldwide?

**AGRICULTURE/INDUSTRY**

7. Where does most of the water used for irrigation come from? Circle your choice from those listed in the parentheses. (desalinated water, salty sources, **rivers & groundwater**, or all three)

**THE NUMBER OF PEOPLE RELYING ON FRESH WATER RESOURCES IS INCREASING EVERY DAY.**

8. In places where freshwater is in limited demand, humans have used dams and water diversion canals to fulfill the need. The concept of bringing in water to areas where water was not available and making the area livable is called?

**WATER MANAGEMENT PROJECTS**

9. As water becomes more depleted, water becomes more expensive. Taking shorter showers and installing a low-flow shower head in your shower are all examples of what?

**WATER CONSERVATION**

10. Why is water conservation a good approach to deal with water shortages?

**IT IS CHEAPER TO SAVE THE WATER WE HAVE THAN TO FIND MORE OF IT.**

11. Define water pollution:

**THE INTRODUCTION OF CHEMICAL, PHYSICAL, OR BIOLOGICAL AGENTS INTO WATER THAT DEGRADE WATER QUALITY AND ADVERSELY AFFECT THE ORGANISMS THAT DEPEND ON IT.**

12. There are 2 types of water pollution. What are they?

- **POINT SOURCE (I.E. ONE DISTINCT SOURCE SUCH AS LEAKING OIL TANKER)**
- **NON-POINT SOURCE (I.E. USUALLY THE RESULT OF RUNOFF, OFTEN AGRICULTURAL RUNOFF)**

13. Define and give 7 examples of point source pollution:

- **LEACHATE FROM LANDFILLS**
- **ACID MINE DRAINAGE**
- **LEAKY OIL TANKER**
- **SEPTIC SYSTEMS**
- **STORAGE LAGOONS**
- **UNDERGROUND STORAGE TANKS**
- **INDUSTRIAL WASTEWATER**

## Environmental Science

14. Define & give 7 examples of and nonpoint source pollution:

- ROAD SALT
- RUNOFF/CITY & SURBAN STREETS
- FECES FROM AGRICULTURAL RUNOFF
- OIL FROM PERSONAL WATERCRAFT
- LAWN PESTICIDES
- LAWN HERBICIDES
- ACID RAIN

15. Pollutants usually enter groundwater when polluted surface water percolates down from the earth's surface. Why is polluted ground water so difficult to clean up?

- DISPERSED THROUGHOUT A LARGE AREA OF ROCK & SAND
- BINDS OR STICKS TO AQUIFERS
- & IT TAKES HUNDREDS OR EVEN THOUSANDS OF YEARS FOR AQUIFERS TO REFRESH THEMSELVES

16. Ocean pollutants are often dumped directly into the ocean. Where do most of the pollutants from the ocean come from?

**ACTIVITIES ON LAND**

## Chapter 12, Air

17. Define air pollution:

**HARMFUL SUBSTANCES BUILD UP IN THE AIR TO UNHEALTHY LEVELS.**

18. The pH scale measures how basic or how acidic a substance is. Pure water has a pH of 7.0, what does acid rain have a pH of? **LESS THAN 5.6**

## Chapter 13, Atmosphere and Climate Change

19. Climate is the long-term prevailing weather conditions at a particular place based upon records taken. Climate is determined by a variety of factors. Weather, climate, and seasons are all effected by the sun's rays. Another term that has to deal with the sun's rays is called the **OZONE** layer.

20. How does the ozone layer shield the earth from much of the sun's harmful radiation?

**THE OZONE LAYER ABSORBS MOST OF THE ULTRAVIOLET LIGHT (RADIATION) EMITTED BY THE SUN.**

21. Which of the following is a fact about the thinning of the ozone layer? Circle your choice from those listed in the parentheses. (occurs over both polar regions, is related to seasonal changes, will take many years to reverse, **or all three**)

22. Remember the Earth is similar to a greenhouse. The Earth's atmosphere acts like the glass in a greenhouse, sunlight streams through the atmosphere and heats the Earth. What is the greenhouse effect?

**THE GREENHOUSE EFFECT IS WHEN EARTH'S ATMOSPHERE ACTS LIKE THE GLASS IN A GREENHOUSE. HEAT IS ABSORBED BY GASSES AND WARMS THE AIR.**

23. What gas is most responsible for the greenhouse effect? Circle your choice from those listed in the parentheses. (nitrous oxide, methane, oxygen, or **water vapor**)

Because the temperature is rising at a similar rate to the increase in greenhouse gases in the atmosphere, many scientists have hypothesized that the increase in greenhouse gases has caused the increase in temperature. This is where the term Global warming was introduced.

24. Define Global warming:

**THE AVERAGE TEMPERATURE AT EARTH'S SURFACE INCREASED DURING THE TWENTIETHY CENTURY.**

25. What are some of the consequences of global warming?

**MELTING ICE, RISING SEA LEVELS, CHANGING GLOBAL WEATHER PATTERNS, STRONGER STORMS, INCREASED SEASONAL ALLERGIES, INCREASED MOSQUITOS SPREADING DISEASE**

26. What is the critical difference between today's global warming and Earth's previous climate changes?

**TEMPERATURE CHANGES MAY BE OCCURRING MORE RAPIDLY THAN PREVIOUS CLIMATE CHANGES**

Environmental Science  
**Chapter 14, Land**

27. Define infrastructure:

**ALL OF THE THINGS THAT A SOCIETY BUILDS FOR PUBLIC USE.**

We use land for many uses, including farming, mining, recreation, and building cities and highways. The primary land use categories are rangeland, forestland, cropland, parks and preserves, urban lands, and wetlands, mountains and deserts.

28. Where do most American live?

**URBAN CENTERS**

29. Define rangeland. What can be done to sustain the productivity of rangeland?

- **LIMIT HERD SIZE**
- **REMOVE INVASIVE PLANTS (PICK THE WEEDS)**
- **LEAVE SECTIONS OF LAND UNUSED FOR SHORT PERIODS OF TIME**

30. Define a rural area. Why should rural areas be preserved?

**PROVIDE VALUABLE ECOSYSTEM SERVICES (PLANTS PROVIDE OXYGEN & ABSORB RUNOFF TO PREVENT FLOODING)**

31. What is urban sprawl? What has happened as a result of it?

**As populations grow, the resources of more rural lands are needed to support the population. The main categories of rural land are: farmland, national and state parks, and wilderness.**

32. What is the difference between deforestation and reforestation?

**DEFORESTATION: CUT DOWN TREES UNSUSTAINABLY**

**REFORESTATION: REPLANT TREES IN DEFORESTED AREAS**

33. Define ecosystem service:

**RESOURCES PRODUCED BY NATURAL AND ARTIFICIAL ECOSYSTEMS SUCH AS: PURIFICATION OF AIR & WATER, PRESERVATION OF SOIL, & FLOOD CONTROL**

- **CLIMATE REGULATION**
- **BIODIVERSITY MAINTENANCE**
- **NUTRIENT CYCLING**
- **WASTE DECOMPOSITION**
- **AESTHETIC BEAUTY**

34. Given that most people live in urban areas, why should rural areas be preserved? Circle your choice from those listed in the parentheses. (they provide crucial infrastructure, **they provide ecological services**, they contain pesticides)

**Chapter 15, Food and Agriculture**

Famine is widespread starvation caused by a shortage in food. Famine happens all over the world. It is predicted that in 2050, the worlds farmers will need to feed about 9 billion people. That is 50 % more than they feed today.

35. Why is feeding the world such a major problem, why are so many people in the world today going hungry?

**FOOD PRODUCTION CANNOT KEEP PACE WITH EXPONENTIALLY GROWING POPULATIONS**

## Environmental Science

36. Much of the earth's surface cannot be farmed. **Only about 10% of the Earth's surface** is arable land. This is why soil erosion is one of the most serious environmental problems. Define soil erosion:

- **DRIVING MACHINERY OVER FIELDS**
- **TILLING AGRICULTURAL FIELDS**

37. What contributes to soil erosion? Circle your choice from those listed in the parentheses. (using composts as fertilizer, allowing land to lie fallow, **driving farm machinery** over fields, or all three)

38. Land degradation happens when human activity or natural processes damage the land so that it can no longer support the local ecosystem. How is Earth's usable cropland being reduced? Circle your choice from those listed in the parentheses. (fast-growing human populations, soil erosion, desertification, **or all three**)

39. Fish and other aquatic organisms provide up to 20% of the animal protein consumed worldwide. But over harvesting is reducing the amount of fish and other organisms in the world's ocean. What is **aquaculture**?

**RAISING AQUATIC CREATURES FOR FOOD. EXAMPLES: TILAPIA, SALMON, SHRIMP**

40. Define farmland and explain how farmland can be desertified:

- **LIVESTOCK IS ALLOWED TO OVERGRAZE**
- **TOO MANY CROPS GROWN ON ONE PIECE OF LAND WITHOUT ROTATION**
- **EROSION**

41. What are the impacts of overharvesting? Circle your choice from those listed in the parentheses. (soil erosion, collapse of food chains, economic collapse, or **all three**)

## Chapter 16 Mining & Mineral Resources

42. Define ore mineral:

**MINERAL THAT CAN BE REMOVED FROM THE EARTH FOR A PROFIT**

43. Define gangue mineral:

**OFTEN BROUGHT TO SURFACE WITH ORE; HAVE NO COMMERCIAL VALUE & SO MUST BE SEPARATED**

44. Define subsurface mining:

**USED TO RETRIEVE MINERALS LOCATED 50 OR MORE METERS BELOW EARTH'S SURFACE.**

45. Define surface mining:

**USED TO RETRIEVE MINERALS LOCATED CLOSE TO EARTH'S SURFACE**

46. What types of pollution can surface mining cause? Circle your choice from those listed in the parentheses. (only air pollution, only noise pollution, **both air & noise pollution**, neither air nor noise pollution)

47. List & describe 3 methods of subsurface mining.

- **ROOM & PILLAR**
- **LONGWALL**
- **SOLUTION**

48. Describe quarrying & determine whether it is a subsurface or surface mining technique.

- **OPEN-PIT MINING (SURFACE)**

49. Define reclamation:

- **PROCESS OF RETURNING LAND TO ORIGINAL OR BETTER CONDITION ONCE MINING IS COMPLETE**

## Chapter 17, Nonrenewable Energy

50. List 3 reasons why fewer nuclear power plants are being built today compared to 40 years ago.
- **COST**
  - **HAZARDOUS WASTE**
  - **RISK OF MELTDOWN/RADIATION RELEASE**
51. Which fuel contains the most solar energy, energy from the sun? Circle your choice from those listed in the parentheses. (uranium, radioactive waste, **fossil fuels**, or all nonrenewable resources)
52. Coal, the most abundant fossil fuel, is mainly used to power plants that generate what?  
**ELECTRICITY**
53. When coal is burned, what is released into the air that is considered a major source of pollution?  
**SULFUR WHICH REACTS WITH WATER IN ATMOSPHERE TO FORM SULFURIC ACID**
54. Which factor is **NOT** used to decide whether or not a fuel is suitable for wide spread use? Circle your choice from those listed in the parentheses. (energy content, cost, availability, **magnetic properties**)
55. List at least 3 advantages of using nuclear energy.  
**ALMOST NO AIR POLLUTION. OTHER ADVANTAGES ARE NO LONGER RELEVANT**

## Chapter 18, Renewable Energy

56. Define geothermal energy:  
**AREAS WHERE DEPOSITS OF WATER ARE HEATED INSIDE THE EARTH TO MAKE STEAM WHICH SPIN TURBINES**
57. Can geothermal power plants be built anywhere? If not, what geological formation must be present?  
**MAGMA CHAMBERS CLOSE TO EARTH'S SURFACE**
58. Define renewable energy:  
**CONSTANTLY BEING FORMED**
59. List 5 advantages of using hydrogen as a future fuel source.
- **MOST ABUNDANT ELEMENT IN THE UNIVERSE**
  - **WATER IS ONLY BYPRODUCT**
  - **CAN BE FUELED BY NATURAL GAS, ALCOHOL, GASOLINE**
  - **MAY BE ABLE TO GROW PLANTS TO PRODUCE HYDROGEN**
  - **DOES NOT RELEASE POLLUTANTS ASSOCIATED WITH FOSSIL FUELS**
60. Define cogeneration:  
**THE PRODUCTION OF TWO USEFUL FORMS OF ENERGY FROM A SINGLE FUEL SOURCE.**
61. Explain how cogeneration can be implemented in an industrial furnace to produce electricity.  
**WASTE HEAT FROM AN INDUSTRIAL FURNACE COULD POWER A STEAM TURBINE THAT PRODUCES ELECTRICITY.**
62. Energy from the sun warms Earth's surface unevenly creating wind. Wind power is one of the most promising renewable energy source. What is the main disadvantage of wind energy?  
**TRANSPORTING WIND ENERGY FROM WHERE IT IS PRODUCED TO WHERE IT IS NEEDED.**
63. What is the most energy efficient vehicle that is accessible to the average consumer?  
**HYBRID CAR**
64. Describe how a hybrid vehicle works.  
**BRAKING SYSTEM USED TO RECHARGE ELECTRIC BATTERY.**
65. Define energy efficiency:  
**PERCENTAGE OF ENERGY PUT INTO A SYSTEM THAT DOES USEFUL WORK.**

**Chapter 19 Waste p.516**

66. Analyze Figure 5 on page 520 & determine what makes up the largest percent of municipal solid waste. The second largest?

**PAPER**

67. Under the Superfund Act, who can the Environmental Protection Agency sue & for what reason?

**THE OWNERS OF HAZARDOUS WASTE SITES WHO HAD ILLEGALLY DUMPED WASTE.**

68. Define compost:

**DARK BROWN CRUMBLY MATERIAL MADE FROM DECOMPOSED PLANT AND ANIMAL MATTER THAT IS SPREAD ON GARDENS AND FIELDS TO ENRICH THE SOIL.**

69. Look at Table 2 on page 526 & list 6 benefits of composting:

- **KEEP ORGANIC WASTES OUT OF LANDFILLS**
- **PROVIDE NUTRIENTS TO THE SOIL**
- **INCREASES BENEFICIAL SOIL ORGANISMS**
- **SUPPRESSES SOME PLANT DISEASES**
- **REDUCES NEED FOR PESTICIDES & FERTILIZERS**
- **PROTECTS SOIL FROM EROSION**

70. Define source reduction & give at least 3 examples:

**ANY CHANGE IN DESIGN, MANUFACTURE, PURCHASE, OR USE OF MATERIALS TO REDUCE TOXICITY BEFORE THEY BECOME MUNICIPAL SOLID WASTE.**

- **DISH TOWELS, RECHARGEABLE BATTERIES, USE BOTH SIDES OF PAPER**

71. Define biodegradable & give at least 5 examples:

**A MATERIAL THAT CAN BE BROKEN DOWN BY BIOLOGICAL PROCESSES.**

- **NEWSPAPER, PAPER BAGS, COTTON FIBERS, LEATHER, WOOD**

72. The two main problems with landfills described in your textbook are leachate & methane. What are they and how can these issues be safely resolved?

- **LEACHATE IS A LIQUID THAT HAS PASSED THROUGH COMPACTED SOLID WASTE IN A LANDFILL. MANAGED WITH MONITORING WELLS & STORAGE TANKS**
- **METHANE IS A HIGHLY FLAMMABLE GAS. MANAGED BY PUMPING OUT OF LANDFILLS FOR USE AS A FUEL.**