



## Appendix G Practice Test#2 Answer Key & Rubrics

1. c.)
  2. b.)
  3. d.)
  4. a.)
- These all refer to the levels or hierarchy of the organization of life, which begins with atoms and ends with the biosphere. The hierarchy goes from the smallest particle (atom) to the largest entity (biosphere). Environmental ecology is concerned with, in hierarchy order: species, population, community, ecosystem, biome and biosphere.
5. c.)
  6. a.)
  7. b.)
  8. d.)
- A trophic level refers to a feeding level. All of the trophic levels make up a food chain. Energy is transferred along a food chain beginning with autotrophs (green plants/algae) on level 1, Primary consumers (herbivores) on level 2, secondary consumers (carnivores) on level 3 and secondary carnivores (carnivores feeding on other carnivores) on level 4.
9. d.)
  10. c.)
  11. c.)
  12. a.)
  13. e.)
  14. b.)
- For these questions you should review the concepts about the various biomes in your study guide or A.P. Environmental Science textbook. The review in your study guide is found on pages 27 - 28.
15. d.)
  16. b.)
  17. a.)
  18. c.)
  19. c.)
- The graph represents a typical population or growth curve also known as an "S" (sigmoid) curve. Usually populations in a new environment will, after a lag or adjustment phase, grow exponentially because resources are high and competition is low. After exponential growth the population is at equilibrium or the carrying capacity. Carrying capacity population numbers will fluctuate above and below the carrying capacity. If the carrying capacity is greatly increased, then extinction may occur.
20. b.)
  21. b.)
  22. a.)
  23. a.)
  24. b.)
- A vulnerable species has a more difficult time adapting than an adaptive species. Among the characteristics of vulnerable species are: narrow distribution, small population, limited genetic variation, large physical size, low biotic potential, limited ability to migrate, small number of offspring, and a long generation time. Panda bears are an example of a vulnerable species.
- Among the characteristics of highly adaptive species are: wide distribution, large population, high degree of genetic variation, small physical size, high biotic potential, large numbers of offspring, short generation time, and the ability to migrate. Insects have the characteristics of a highly adaptive species.



- C**
- 25. b. } The diagrams represent an age profile, showing the number of individuals in each age group also called a cohort. An age profile like diagram A has a small base, meaning that the number of people who will be of reproduction age is relatively small, thus a slowing population growth. This is typical of developed countries. However the opposite is true of diagram B and is typical of developing countries.
  - 26. a. }
  - 27. c. }
  - 28. b. }
  - 29. a. } See chart on test
  - 30. a. }  $(43)(5.7) = 245.10$  quadrillion BTUs
  - 31. c. } See chart on test
  - 32. c. } See chart on test
  - 33. b. } These four environmental disasters are among the most commonly known. Review your textbook for more information on these events.
  - 34. c. }
  - 35. a. }
  - 36. a. }
  - 37. d. }
  - 38. a. } Review your study guide pages 81-85 for more information on important environmental laws and regulations. You should be able to quote some of these usually on the free response questions.
  - 39. b. }
  - 40. e. }
  - 41. a. }
  - 42. d. }
  - 43. c. } Be familiar with the general operation of nuclear, coal, oil, and natural gas power plants. There are informative numerous websites that can provide diagrams and additional information.
  - 44. ac. }
  - 45. e. }
  - 46. abc. }
  - 47. c. }
  - 48. d. }
  - 49. ab. }
  - 50. ad. }



38 ~~51~~. a.

The Cairo Conference in September 1994 was the third U.N. conference on population and development, attended by 15,000 leaders and representatives, from 179 nations and almost 1,000 non-governmental organizations.

52. d.

Mollisols are very fertile soils with a deep A horizon and rich in humus and minerals.

39 ~~53~~. c.

A praying mantis is a carnivore, eating insects, and occupies the same trophic level as other carnivores, such as weasels, wolves, etc. and is on the third level.

54. e.

The more value you can give to saving a forest the better changes you would have to meeting your objective. All of the choices would strengthen your case.

41 ~~55~~. c.

Biodiversity, the variety of life, is found in all ecosystems, but is much greater in tropical regions, such as a coral reef.

42 ~~56~~. a.

The Chernobyl incidence was a complete meltdown of a nuclear reactor and was caused by human error that was also combined with the lack of redundancies, or backups.

43 ~~57~~. b.

The secondary sewage treatment process follows the processes, removal of debris and grit ... Removal of particulate organic materials... ..Removal of colloidal and dissolved material... Disinfection

44 ~~58~~. a.

Experience has shown that when people own their property, they will take an active role in maintaining their investment. Policies, volunteers, and more housing have not been successful in curtailing urban blight.

45 ~~59~~. b.

Plants require nitrogen, and nitrogen is also a plant macronutrient. Plants however can't use nitrogen in its elemental form. Plants require nitrogen in the form of either ammonium, or nitrite.

46 ~~60~~. c.

For any experiment to be considered valid there must be a control. Without a control group there is no way to know if the parameter you are testing, nitrogen, makes a difference in plant growth. The plants may have shown poor growth anyway, with or without nitrogen-fixing bacteria, there is not way to tell without the control group.

47 ~~61~~. a.

Carbon to put in the environment/ecosystem in many ways through; internal combustion, decomposition, fires, volcanoes, respiration etc. but is only removed by two major processes, photosynthesis, and absorption in the ocean by marine algae (sometimes the oceans are called carbon "sink")

48 ~~62~~ c.

Competition among organisms has no winners. Even though one larger stronger animal, for example, may get the resource, that animal will still have to expend energy to get that resource. By separating themselves for each other, warblers use resource partitioning to avoid or lessen competition.

49 ~~85~~ c.

Estuaries are places where marshes, lakes, or rivers meet the ocean. These areas are very important because many young organisms find protection from the harsh open ocean; in other words, they get their start there. It's also ideal because lots of nutrients are present in estuaries.

50 ~~64~~ a.

In curve A, population is growing exponentially; this represents population growth under ideal conditions, no or few limiting factors. After reaching way above the carrying capacity, the population crashes. In curve B the population fluctuates around its carrying capacity.

51 ~~65~~ b.

Adverse weather conditions can slow a population's growth. Some animals for example will NOT breed under drought conditions. All of the other factors may actually increase a population's growth.

52 ~~66~~ c.

Mutualism is a relationship between two organisms where both organisms benefit from the relationship. In the case of trees and epiphytic, or air plants the epiphyte benefits by attaching to the tree where it can more efficiently acquire nutrients, while the tree benefits by the small amounts of nutrients that are gathered by the epiphyte through the collection of rainfall. Many people believe that these air plants are parasitic to the trees since they are attached to them, however, the air plant DOES NOT take any nutrients from the tree or weaken its growth.

53 ~~67~~ e.

Ecosystems get rid of their wastes, and recycle some but not all the elements.

54 ~~68~~ d.

For enhanced reproductive success an organism must be able to migrate or spread seeds. Migration allows organism to find mates, and have a better mate selection, while dispersal of seeds allows plants to germinate and grow without competing with the parent plant.

55 ~~69~~ c.

After World War II returning soldiers started families that had relatively large numbers of children, around 4 per family was typical. This is known as the post World War II "Baby Boom". This group of babies, known in population ecology as a cohort (a group born at about the same time) is now nearing retirement age.

56 ~~70~~ a.

Loam, considered at the BEST soil for agriculture, is made up of 40% sand, 40% silt, and 20% clay. This mixture allows some water to be held without the soil becoming waterlogged, and provides a good mix of nutrients.

57 ~~71~~ d.

The "O" horizon consists of surface litter and decomposing plant matter. The "O" stands for organic, since it contains dead organic matter.



58 72. e.

For roots to thrive they must have good aeration, oxygen, and some water holding capacity, however, water MUST be able to move through the soil. Soils that allow water to stand too long, reduce oxygen, and cause "root rot" to many species of terrestrial plants.

59 73. c.

Humus is extremely important towards improving soils. Mineralization refers to the gradual oxidation of organic matter, and leaves a gritty mineral component to soil. This is caused by declining humus content and leads to decline in nutrient holding capacity, infiltration and aeration, and eventual collapse of the topsoil.

60 74. a.

Production of pollutions is not considered a service.

61 75. c.

62 76. a.

$^{235}\text{U}$  is the fissionable form used in nuclear power plants.

63 77. b.

Neutrons are the subatomic particle that starts and sustains a nuclear reaction. It takes a neutron hitting the  $^{235}\text{U}$  nucleus at just the right speed to cause fission. When the neutron hits  $^{235}\text{U}$  at just the right speed,  $^{236}\text{U}$ , a highly unstable product, undergoes fission immediately into lighter atoms called fission products. The fission reaction then gives off several more neutrons and releases tremendous amount of energy. Usually these neutrons are traveling too fast to cause fission, but can be controlled and slowed down to cause more fission in a domino like effect called a chain reaction.

78. d.

First generation pesticides were among the first pesticides produced and contain toxic heavy metals, such as lead, and mercury. These early substances are very accumulating in soils, and inhibit plant growth and poison other organisms, including humans.

65 79. c.

Biological controls are a means of using living organisms to control unwanted pests. These may include certain bacteria's like BT, bacillus thuringiensis, or insects such as ladybugs. Another effective method of insect or pest control is by using sterile males, since many female insect only breed once in a lifetime.

66 80. b.

Coliform bacteria are found in the intestines of many animals. The presence of this type of bacteria is an indication that animal waste material is in that body of water. Since animal wastes may contain many pathogenic bacteria, the water is considered unsafe to drink or swim in.

67 81. e.

82. a.

83. b.

84. c.



74 ~~85~~. e.

Ozone,  $O_3$ , is a naturally occurring mainly in the stratosphere. It acts as a shield that protects organisms from UV, ultra violet radiation.

75 ~~86~~. a.

76 ~~87~~. d.

VOC's or volatile organic compounds will evaporate into the air in a vaporous state, and are considered a major air pollutant. They are a result of incomplete combustion of fuels and wastes.

77 ~~88~~. e.

Due to strict government regulation of gasoline, which formally contained lead, gasoline of today are lead free, resulting in a sharp decline of lead in the atmosphere.

89. a.

In engineering practices and design cost benefit is extremely important, by comparing the estimated costs to the benefits. Sometimes extra costs at the beginning of a project might save \$\$ in the long run for maintenance costs, repair of rundown parts etc.

79 ~~90~~. d.

Automobiles simply encourage people to move out of the cities, cause air pollution, and clog public transportation.

80 ~~91~~. a.

Urban sprawl, moving from the cities to urban areas, results in a great loss of agricultural land.

81 ~~92~~. c.

Saltwater intrusion occurs when saltwater flows into the underground freshwater aquifer. Lowering of the water table, which normally provides pressure significant enough to keep saltwater out, causes this problem. The ground water becomes contaminated with salt making it unusable or very expensive to purify.

82 ~~93~~. b.

The Lacy Act of 1900 prohibits interstate commerce from dealing with illegally killed wildlife making it more difficult for hunters to sell their kill.

83 ~~94~~. d.

A keystone species is vital for the survival of other species, for example, reintroduction of wolves into Yellowstone Park in Wyoming, increased the number of songbirds in the park. This occurred because the wolves preyed on animals at rivers and streams, keeping their numbers in check. This lowered population of these animals, and allowed vegetation at the riverbanks to grow, (before the wolves there were too many grazers, which trampled the plants). The result was that many songbirds were attracted to the new vegetation.

84 ~~95~~. a.

CITES, or the Convention on Trade in Endangered Species, is an international treaty conveying some protection to endangered and threatened species by restricting trade of those species or their products.



85-96. d.

Destruction of habitat is foremost in most environmental problems. All organisms on this planet MUST have a habitat for their survival.

96-97. a.

Forest fragmentation, the destruction of some areas, while leaving others, has the greatest effect on specialized species. These species have a very limited ability to adapt to new or changing environments.

97-98. e.

Humans are the major component of the treaty.

98-99. b.

The maximum sustainable yield is the amount of a renewable resource that can be taken year after year without depleting that resource. It refers to the maximum harvest that is balanced by the regenerative capacities of that ecosystem.

99-100. c.

Tragedy of the Commons refers to the idea that many people use a common resource, often depleting it, where no one owns or takes care of the resource.

90-92. e

Terrestrial biomes are very large areas that exhibit similar types of vegetation, animal life, climate and soils. The climate, temperature and precipitation are the most important factors in determining what types of plants and animals can inhabit the area. Although soil type is important, temperature and precipitation are the main determining factors.

91-93. d

Technology is currently available to harness the petroleum from oil shale and tar sands, however it is currently too expensive to mine in comparison to crude oil. Shale and tar sands do not provide enough energy to meet the demands of today.

92-94. c

There are many adaptive features that organisms develop, but it is closely tied to the particular environmental changes that occur. Therefore, a combination of traits enhances the organism's survival.

93-95. e

There are numerous water pollutants, among them are: sediments, toxic chemicals, solid wastes and additional nutrients.

94-96. e

Removing groundwater faster than it can be replenished can produce serious consequences. These include: decreased stream flow rates, saltwater intrusion, unproductive agricultural lands and lower property values.

95-97. e

We are constantly bombarded by radiation from the sun, modern technology and terrestrial sources. These include: x-rays, microwaves, cosmic rays, radon and uranium.

96-98. d

Storm water runoff is all of the material that comes from water running off of the streets, parks, etc. Included in storm water are fertilizers, pesticides, bacterial waste, oils, leaves and sticks. Activated sludge is found in the wastewater treatment process.

97 ~~35. d~~

A typical soil profile consists of an O horizon (humus), A horizon (topsoil), and E horizon (zone of leaching where less humus and minerals are present). The E horizon gets its name from elevation or leaching downward of minerals. The B-horizon is next, and is subsoil and an accumulation of leached material. Finally, the C-horizon is the parent material.

98 ~~34. e~~

The environmental movement started when people began to see natural resources disappearing as early as the late 1800's. Air and water quality was declining and human wastes were seen almost everywhere. During the dust bowl in the 1930's, where large amounts of cropland were destroyed, people began to look more towards conservation and not the misuse of land. Environmentalists, actually a biologist, such as Rachel Carson shocked the world by her book "Silent Spring" in 1962. There she wrote how, the use of DDT, a pesticide now banned, would kill songbirds.

99 ~~35. a~~

Condensation is the formation of water molecules to form a liquid or even ice. A high relative humidity of 100% means that the air is saturated with water vapor. Cooling causes the water molecules to form condensation.

100 ~~36. b~~

Temperatures of around 78 degrees Fahrenheit characterize tropical rainforests, and frequent heavy rains. Although the temperate deciduous forest has rain throughout the year, the temperatures are variable from hot in the summer to below freezing during the winter months.