

# APES GREATEST HITS

## MIDTERM REVIEW

\* = not covered in 2009 mid-term

1. High Quality Energy: organized & concentrated, can perform useful work (ex fossil fuel & nuclear)
2. Low Quality Energy: disorganized, dispersed (heat in ocean or air wind, solar)
3. First Law of Thermodynamics: energy is neither created nor destroyed, but may be converted from one form to another
4. Second Law of Thermodynamics: when energy is changed from one form to another, some useful energy is always degraded into lower quality energy (usually heat)
5. Natural radioactive decay: unstable radioisotopes decay releasing gamma rays, alpha & beta particles
6. Half life: the time it takes for 1/2 the mass of a radioisotope to decay
7. Estimate of how long a radioactive isotope must be stored until it decays to a safe level: approximately 10 half-lives
8. Ore: a rock that contains a large enough concentration of a mineral making it profitable to mine
9. Mineral Reserve: identified deposits currently profitable to extract
10. Surface mining: cheaper & can remove more mineral, less hazardous to workers
11. Humus: organic, dark material remaining after decomposition by microorganisms
12. Leaching: removal of dissolved materials from soil by water moving downwards
13. Illuviation: deposit of leached material in lower soil layers (B)
14. Loam: perfect agricultural soil with equal portions of sand, silt, clay
15. Solutions to soil problems: conservation tillage, crop rotation, contour plowing, organic fertilizers
16. Nitrogen fixing: because atmospheric N cannot be used directly by plants it must first be converted into ammonia by bacteria
17. Ammonification: decomposers convert organic waste into ammonia
18. Nitrification: ammonia is converted to nitrate ions ( $\text{NO}_3^-$ )
19. Assimilation: inorganic N is converted into organic molecules such as DNA/amino acids & proteins
20. Denitrification: bacteria convert ammonia back into N
21. Phosphorus does not circulate as easily as N because: it does not exist as a gas, but is released by weathering of phosphate rocks
22. Because soils contain very little phosphorus: it is a major limiting factor for plant growth
23. Excess phosphorus is added to aquatic ecosystems by fertilizers placed on crop fields which leach into groundwater and runoff into streams
24. Photosynthesis: plants convert atmospheric C ( $\text{CO}_2$ ) into complex carbohydrates (glucose  $\text{C}_6\text{H}_{12}\text{O}_6$ )
25. Aerobic respiration: oxygen consuming producers, consumers & decomposers break down complex organic compounds & convert C back into  $\text{CO}_2$
26. Largest reservoirs of C: carbonate rocks first, oceans second
27. Biotic/abiotic: living & nonliving components of an ecosystem
28. Producer/Autotroph: photosynthetic life
29. Major trophic levels: producers-primary consumer-secondary consumer-tertiary consumer
30. Energy flow in food webs: only 10% of the usable energy is transferred
31. Why is only 10% transferred: usable energy lost as heat (2nd law), not all biomass is digested

- & absorbed, predators expend energy to catch prey
32. Primary succession: development of communities in a lifeless area not previously inhabited by life (lava)
  33. Secondary succession: life progresses where soil remains (clear cut forest)
  34. Mutualism: symbiotic relationship where both partners benefit
  35. Commensalism: symbiotic relationship where one partner benefits & the other is unaffected
  36. Parasitism: relationship in which one partner obtains nutrients at the expense of the host
  37. Biome: large distinct terrestrial region having similar climate, soil, plants & animals
  38. Carrying capacity: the number of individuals that can be sustained in an area
  39. R strategist: reproduce early, many small unprotected offspring
  40. K strategist: reproduce late, few, cared for offspring
  41. Natural selection: organisms that possess favorable adaptations pass them onto the next generation
  42. Malthus: said human population cannot continue to increase .. consequences will be war, famine & disease
  43. Doubling time: rule of 70 70 divided by the percent growth rate
  44. Replacement level fertility: the number of children a couple must have to replace themselves (2.1 developed, 2.7 developing)
  45. World Population is 6.7 billion
  46. Preindustrial stage: birth & death rates high, population grows slowly, infant mortality high
  47. Transitional stage: death rate lower, better health care, population grows fast
  48. Industrial stage: decline in birth rate, population growth slows
  49. Postindustrial stage: low birth & death rates
  50. Age structure diagrams: (broad base, rapid growth)(narrow base, negative growth)(uniform shape, zero growth)
  51. 1st & 2nd most populated countries: China & India
  52. Most important thing affecting population growth: low status of women
  53. Ways to decrease birth rate: family planning, contraception, economic rewards & penalties
  54. Minamata Disease: mental impairments caused by mercury poisoning in Japan
  55. Love Canal, NY: chemicals buried in old canal and school & homes built over it causing birth defects & cancer
  56. Keystone species: species whose role in an ecosystem are more important than others
  57. Indicator species: species that serve as early warnings that an ecosystem is being damaged
  58. Most endangered species: have a small range, require large territory or live on an island
  - \*59. In natural ecosystems, 50-90% of pest species are kept under control by: predators, diseases, parasites
  - \*60. Major insecticide groups and examples: (chlorinated hydrocarbons, DDT) (organophosphates, malathion) (carbamates, aldicarb)
  - \*61. Pesticide pros: saves lives from insect transmitted disease, increases food supply, increases profits for farmers
  - \*62. Pesticide cons: genetic resistance, ecosystem imbalance, pesticide treadmill, persistence, bioaccumulation, biological magnification
  - \*63. Natural pest control: better agricultural practices, genetically resistant plants, natural enemies, biopesticides, sex attractants
  64. Two most serious nuclear accidents: (Chernobyl, Ukraine) (Three Mile Island, PA)
  65. LD50: the amount of a chemical that kills 50% of the animals in a test population
  66. Mutagen, Teratogen, Carcinogen: causes hereditary changes, Fetus deformities, cancer
  67. Multiple use US public land: National Forest & National Resource lands
  68. Moderately restricted use land: National Wildlife Refuges
  69. Restricted Use lands: National Parks, National Wilderness Preservation System
  70. Volcanoes and Earthquakes occur: at plate boundaries (divergent, spreading, mid-ocean

ridges) (convergent, trenches) (transform, sliding, San Andreas)

71. Endangered Species Act: identifies threatened and endangered species in the US, and puts their protection ahead of economic considerations

72. Convention on International Trade in Endangered Species: lists species that cannot be commercially traded as live specimens or wildlife products

\*73. Federal Insecticide, Fungicide, Rodenticide Act: regulates the effectiveness of pesticides

\*74. Food Quality Protection Act: set pesticide limits in food, & all active and inactive ingredients must be screened for estrogenic/endocrine effects

75. Study your notes and review sheets at LEAST three times!!!