

1. 75% of water pollution in the US come from	soil erosion, atmospheric deposition and surface run off	19. biotic potential	maximum amount of offspring a species can have
2. 95% of water in developing countries come from	raw sewage (high population growth without the money for treatment plants)	20. biotic/abiotic	living and nonliving components of an ecosystem
3. 1970 national environmental policy act	created the council on environmental quality that resulted in the creation of the EPA from the consolidation of various environmental agencies. it also mandates that federal agencies prepare environmental impact statements	21. BOD	biological oxygen demand, amount of dissolved oxygen needed be aerobic decomposers to break down organic materials
4. acid deposition	cause by sulfuric and nitric acids resulting in lowered pH of surface waters	22. carbon oxides	(Source: auto exhaust, incomplete combustion) (effects: CO binds to hemoglobin reducing bloods ability to carry O, CO ₂ contributes to global warming) (Reduction: catalytic converter, emissions testing, oxygenated fuel, mass transit)
5. acute effects	are caused by a single exposure to a toxin and results in an immediate health crisis of some sort	23. carrying capacity	the number of individuals that can be sustained in an area
6. aerobic respiration	oxygen consuming producers, consumers and decomposers break down complex organic compounds and covert C back into CO ₂	24. chronic effects	are long lasting and can result from a single exposure of a very toxic substance or a continuous exposure to the toxin
7. age structure diagrams	(broad base, rapid growth) (narrow base, negative growth) (uniform shape, zero growth)	25. clean water act 1972	protect all surface waters in the U.S. reduced direct pollutant discharges into waterways, financed municipal waste water treatment facilities, and manages polluted runoff, restoring and maintaining the chemical, physical and biological integrity of the nation's waters
8. alternate energy sources	wind, solar, waves, biomass, geothermal, fuel cells	26. clear cutting is bad because	it increases soil erosion dramatically, increases nitrate runoff into water bodies, makes it hard for an area to recover, leaves animals no place to live and can lead to extinctions
9. ammonification	decomposers convert organic waste into ammonia	27. coastal zone management act 1990	balance ecosystem conservation, balance ecosystem development controls non point pollution along the coast
10. aquifer	any water bearing layer in the ground	28. commensalism	symbiotic relationship where one partner is benefited and the other is unaffected
11. assimilation	inorganic N is converted into organic molecules such as DNA/amino acids and proteins	29. comprehensive environmental response compensation and liability act	regulated damage done by mining; created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly yo releases or threatened releases of hazardous substances the may endanger public health of the environment. established prohibitions and requirement concerning closed and abandoned hazardous waste sites. provided liability of persons responsible for releases of hazardous waste at these sites; established a trust fund to provide for cleanup when no responsible party could be identified.
12. because soil contains very little phosphorus	it is a major limiting factor for plant growth	30. cone of depression	lowering of the water table around a pumping well
13. best solution to energy shortage	conservation and increase efficiency		
14. best way to solve waste problem	reduce the amounts of waste at the source		
15. bioaccumulation	is the selective absorption and storage of a great variety of molecules		
16. biomagnification	is a continued increase in the concentration of pollutants in higher levels of a food chain		
17. biome	large distinct terrestrial region having similar climate, soil, plant and animals		
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31. cons of petroleum	reserves depleted soon, pollution during drilling, transport and refining, burning makes CO ₂	46. endangered species act 1973	provided broad protection for species of fish, wildlife, and plants that are listed as threatened or endangered with the U.S. or elsewhere
32. conservation	is the management of a resource to make certain it produces the greatest benefit to humans in the future	47. energy flow through food webs	only 10% of the usable energy is transferred
33. convention on international trade in endangered species CITES 1975	an international agreement between governments that ensures that international trade in specimens of wild animals and plants don't threaten their survival	48. ENSO	el nino southern oscillation, seesawing of air pressure over the S. pacific
34. denitrification	bacteria convert ammonia back to N	49. estimate of how long a radioactive isotope must be stored until it decays to a safe level	approximately 10 half-lives
35. density dependent factors	competition, parasitism, predation	50. eutrophication	rapid algal growth caused by an excess of N & P
36. density independent factors	fire, floods, extreme cold	51. excess phosphorus is added to aquatic ecosystems by	runoff of animal wastes, fertilizer discharge of sewage
37. doubling time	rule of 70: 70 divided by the percent growth rate	52. exotic species are known as invasive species because	they often can grow at an uncontrolled rate because they have no natural predators, disrupt the balance of infectious diseases and more extreme weather conditions
38. during and el nino year; during a non el nino year	trade winds weaken and warm water sloshed back to SA; easterly trade winds and ocean currents pool warm water in the western pacific, allowing upwelling of nutrient rich water off the west coast of south America	53. fact	1.5 billion people lack access to clean drinking water and 3 billion people lack good sanitation need to prevent communicable disease from spreading
39. ecological services of forests	regulate climate, control water runoff, produce oxygen and provide food and shelter for many creatures	54. federal food drug and cosmetic act	sets limits for residue on food and keeps food safe
40. effects of el nino	upwelling decreases disrupting food chains, N US has mild winters, SW US has increased rainfall, less atlantic hurricanes	55. federal insecticide, fungicide, and rodenticide act (fifra) 1947	requires the EPA to approve the use of all pesticides in the U.S.
41. effects of global warming	rising sea level (thermal expansion), extreme weather, droughts (famine), extinctions	56. first law of thermodynamics	energy is neither created or destroyed, but may be converted from one form to another
42. effects of global warming	bleaching of coral reefs, animals and plants forced out of their current range, melting glaciers, rising sea level, droughts, spread of infectious diseases and more extreme weather conditions	57. fisheries conservation and management act 1996	created fishery management council protected fish habitats and reducing by catch
43. effects of ozone depletion	(increase UV, skin cancer, cataracts, decreased plant growth)		
44. electricity is generated by	using steam (from water boiled by fossil fuels or nuclear) or falling water to turn a generator		
45. emergency planning and community right to know act	facilitated deadlines, provides info on chemicals and storing them, improves access to chemical info		

58. food security act 1985	discouraged the conversion of wetlands to non wetlands 1990 federal legislation denied federal farm supplements to those who converted wetlands to agriculture, and provided a restoration of benefits to those who unknowingly converter lands to wetlands	73. ionizing radiation	enough energy to knock electrons from atoms forming ions, capable of causing cancer (Ex gamma-X rays- UV)
59. forests	11% is used for crops 26% is range and pasture	74. k strategist	reproduce lat, few, cared for offspring
60. greenhouse gases	(Examples: H ₂ O, CO ₂ , O ₃ , methane (CH ₄), CFC's) (effects: they trap outgoing infrared (heat) energy causing earth to warm)	75. keystone species	species whose role in an ecosystem are more important than others
61. half-life	the time it takes for half the mass of a radioisotope to decay	76. kyoto protocol 2001	reduces greenhouse gas emissions that are linked to climate change and global warming
62. high quality energy	organized and concentrated, can perform useful work (Ex fossil fuel and nuclear)	77. largest reservoirs of C	carbonate rock first, oceans second
63. human have caused extinction rates of hundreds to thousands of species per year	if these trends continue 1/3 to 2/3 of all current species will be lost by the year 2050	78. LD 50	the amount of a chemical that kills 50% of the animals in a test population
64. humus	organic, dark material remaining after decomposition by microorganisms	79. leaching	removal of dissolved materials from soil by moving downwards
65. hypoxia	when aquatic plants die the BOD rises as aerobic decomposers break down the plants, the DO drops and the water cannot support life	80. loam	perfect agriculture soil with equal portions of sand, silt, and clay
66. illuviation	deposit of leached material in lower soil layers	81. love canal, ny	chemical buried in old canal and school and homes built over it causing birth defects and cancer
67. in natural ecosystems, 50-90% of pest species are kept under control by	predators, diseases, parasites	82. low quality energy	disorganized, dispersed (heat in ocean or aim wind, solar)
68. incineration advantages	volume of waste reduced by 90% and waste heat can be use	83. major insecticide groups and examples	(chlorinated hydrocarbons, DDT) (organophosphates, malathion) (carbamates, aldicarb)
69. incineration disadvantages	toxic emissions (polyvinyl chloride-dioxin), scrubbers and electrostatic precipitaators needed, ash disposal	84. major parts of a nuclear reactor	core, control rods, steam generator, turbine, containment building
70. indicator species	species that serve as early warnings that an ecosystem is being damaged	85. marine mammal protection act 1972	established federal responsibility to conserve marine mammals
71. industrial smog	found in cities that burn large amounts of coal	86. minamata disease	mental impairments caused by mercury
72. industrial stage	decine in birth rate, population growth slows	87. mineral reserve	identified deep deposits currently profitable to extract
		88. moderately restricted use land	nation wildlife refuges
		89. montreal protocol	phasing out of ozone depletion compounds cfcs
		90. most endangered species	have a small range, require large territory or live on an island
		91. most important thing affecting population growth	low status of women
		92. most municipal waster is	landfilled
		93. most populated countries	china and india

94.	multiple use US public lands	National Forest and National Resources lands	110.	ore	a rock that contains a large enough concentration of a mineral making it profitable to mine
95.	municipal solid waste	is mostly paper	111.	ozone	(formation: secondary pollutant, $\text{NO}_2 + \text{UV} - \text{NO} + \text{O} + \text{O}_2 = \text{O}_3$, with VOC's) (effects: respiratory irritant, plant damage) (reduction: reduce NO emissions and VOC's)
96.	mutagen, teratogen, carcinogen	1. causes hereditary changes 2. causes fetus deformities 3. causes cancer	112.	ozone depletion caused by	CFC's, methyl chloroform, carbon tetrachloride, halon, methyl bromide all of which attack stratospheric ozone)
97.	mutualism	symbiotic relationship where both partners benefit	113.	parasitism	relationship in which one partner obtains nutrients at the expense of the host
98.	natural pest control	better agriculture practices, genetically resistant plants, natural enemies, bio pesticides, sex attractants	114.	particulate matter	(source: burning fossil fuels and car exhaust) (effect: reduces visibility and respiratory irritation) (reduction: filtering, electrostatic precipitators, alternative energy)
99.	natural radioactive decay	unstable radioisotopes decay releasing gamma rays, alpha, and beta particles	115.	parts of the hydrologic cycle	evaporation, transpiration, runoff, condensation, precipitation, infiltration
100.	natural selection	organisms that possess favorable adaptations pass them onto the next generation	116.	percent water on earth by type	97.5% seawater, 2.5% freshwater
101.	NIMBY	public protests cause wastes and other pollutants to be dumped in someone else's backyard. mostly hurts the poor who cannot pay for representation to fight against potential pollution	117.	persistent organic pollutants treaty	protects human health from chemicals that remain intact in the environment
102.	nitrification	ammonia is converted to nitrate ions (NO_3^-)	118.	pesticide cons	genetic resistance, ecosystem imbalance, pesticide treadmill, persistence, bioaccumulation, biological magnification
103.	nitrogen fixing	because atmospheric N cannot be used directly by plants it must first be converted into ammonia by bacteria	119.	pesticide pros	saves lives from insect transmitted disease, increase food supply, increase profits for farmers
104.	nitrogen oxides	(source: auto exhaust) (effects: acidification of lakes, respiratory irritation, leads to smog and ozone) (equation for acid formation: $\text{NO} + \text{O}_2 = \text{NO}_2 + \text{H}_2\text{O} = \text{HNO}_3$) (reduction catalytic converter)	120.	petroleum forms from	microscopic aquatic organisms in sediments converted by heat and pressure into a mixture of hydrocarbons
105.	nuclear fission	nuclei of isotopes split apart when struck by neutrons	121.	phosphorus does not circulate as easy as N because	it does not exist as a gas, but is released by the weathering of phosphate rocks
106.	nuclear fusion	2 isotopes of light elements (H) forced together at high temperatures till they fuse to form a heavier nucleus. expensive, break point not reached yet	122.	photochemical smog	formed by chemical reactions involving sunlight (NO, VOC, O)
107.	nuclear waste policy	established both the federal government's responsibility to provide a place of the permanent disposal of high level radioactive waste and spent nuclear fuel, and the generators responsibility to bear the costs of permanent disposal.	123.	photosynthesis	plants convert atmospheric (CO_2) into complex carbohydrates (glucose $\text{C}_6\text{H}_{12}\text{O}_6$)
108.	ocean dumping act 1972	made it unlawful for any person to dump, or transport for the purpose of dumping sewage sludge, or industrial waste into ocean waters	124.	point vs. non point sources	(point, from specific location such as pipe) (non point, from over an area such as runoff)
109.	oil spill prevention and liability act	strengthened EPA's ability to prevent and respond to catastrophic oil spills. established a trust fund which is available to clean up oil spills	125.	pollution prevention act 1990	designed to promote source reduction (stop pollution from being produced)

126. postindustrial stage	low birth and death rates	143. secondary air pollutants	formed by reaction of primary pollutants
127. preindustrial stage	birth and death rates high, populations grows slowly, infant mortality high	144. secondary succession	life progresses where soil remains (clear cut)
128. preservation	is the concept that the land should be kept in its natural state- never touched or developed	145. selective cutting	harvesting only mature trees of certain species and size. more expensive but less disruptive to wildlife than clear cutting
129. primary air pollutants	produced by human and nature (CO, CO ₂ , SO ₂ , NO, hydrocarbons, particulates)	146. shoreline erosion control act	provide shoreline protection and improve sediment retention; prevents coastal erosion
130. primary succession	development of communities in a lifeless area not previously inhabited by life (lava)	147. soil and water conservation act 1977	soil and water conservation programs to aid landowners and users; also sets up condition to continue evaluation the condition of U.S. soil, water, and related resources
131. producer/ autotroph	organisms that will make their own food-photosynthetic life	148. solutions to soil problems	conservation tillage, crop rotation, contour plowing, organic fertilizers
132. pros of petroleum	cheap, easily transported, high quality energy	149. steps in coal formation	peat, lignite, bituminous, anthracite
133. r strategist	reproduce early, many small unprotected offspring	150. stratosphere	contains the ozone
134. range of tolerance	minimum and maximum levels of conditions in which organisms can survive	151. sulfur oxides	(source: coal burning) (effects: acid deposition, respiratory irritation, damages plants) (equation for acid formation: SO ₂ + O ₂ = SO ₃ + H ₂ O = H ₂ SO ₄) (reduction: scrubbers, burn low sulfur fuel)
135. replacement level fertility	the number of children a couple must have to replace themselves (2.1 developed, 2.7 developing)	152. surface mining	cheaper and can remove more mineral, less hazardous to workers
136. resource conservation and recovery act 1976 RCRA	regulated some mineral processing wastes; encourages states to develop comprehensive plans to manage nonhazardous industrial solid wastes and municipal waste, sets criteria for municipal solid waste landfills and other solid waste disposal facilities; cradle to grave system,	153. surface mining control and reclamation act 1977	regulate environmental effects of coal mining and cleaning out of abandoned mines
137. restricted use lands	national parks, National Wilderness Preservation system	154. surface mining control and reclamation act 1977	established a program for regulating surface mining and reclamation activities. it established mandatory standards for these activities on state and federal lands including a requirement the adverse impacts on fish, wildlife, and related environmental values be minimized
138. safe drinking water act 1974	established a federal program to monitor and increase that safety of the drinking water supply.	155. survivorship curves	type 1: low mortality at birth, survival to old age, and then die (human, annual plant) type 2: uniform death rates, subject to predation (insects, birds) type 3: high mortality at birth but long lifespans other wise (turtles, trees)
139. salinization of soil	in arid regions, water evaporates leaving behind salts	156. the atmosphere composition is:	78% nitrogen, 21% oxygen, and a small amount of argon, carbon dioxide, water, salt and dust
140. salt water intrusion	is the movement of salt water into freshwater aquifers in coastal areas where groundwater is withdrawn faster that it's replenished	157. the US uses 77% of	all pesticides in the world
141. sanitary landfill problems and solutions	(leachate, liner with collection system) (methane gas, collect gas and burn) (volume of garbage, compact and reduce)		
142. 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)		

158. thomas malthus	said human population cannot continue to increase.. consequences will be war, famine,and disease	173. wilderness act 1964	established a review of road-free areas of 5,000 acres or more and islands within the National Wildlife Refuges on the National Park System for inclusion in the Nation Preservation System This act restricted activities in these areas
159. toxic substances control act TSCA 1976	gave the EPA the ability to track the 75,000 industrial chemicals currently produced or imported into the U.S. EPA repeatedly screens these chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. allows the EPA to ban the manufacturing and import of those chemicals that pose unreasonable risk.	174. world population is	over 6 billion; US population 300,000,000 last year
160. transitional stage	death rate lower, better health care, population grows fast		
161. trophic levels	producers- primary consumers- secondary consumers- tertiary consumer		
162. troposphere	contain weather		
163. two most serious nuclear accidents	chernobyl, ukraine three mile island, pa		
164. utilitarianism	is the belief that something is right if it produces the greatest good for the greatest number of people for the longest time		
165. valdez, alaska	arch 24, 1989 tanker Exxon Valdez hits submerged rocks in Prince William Sound worst oil spill in US waters		
166. volcanoes and earthquakes occur	aat plate boundaries (divergent- spreading ex. min-ocean ridges) (convergent, ex. trenched. Mineral deposits are most abundant at convergent boundaries) (transform sliding ex. San Andreas)		
167. watershed	land surface and groundwater aquifers drained by a particular river system		
168. ways to conserve water	(agriculture, drip/trickle irrigation) (industry, recycling) (home. use gray water, repair leaks, low flow fixtures)		
169. ways to decrease birth rate	family planning, contraception, economic rewards and penalties		
170. weather moves from	west to east across America and winds are named for the direction they come from		
171. why is only 10% of usable energy transferred?	usable energy lost as heat (2nd law), not all biomass is digested and absorbed, predators expend energy to catch prey		
172. wild and scenic rivers act 1968	established a National Wild and Scenic Rivers System for the protection of rivers with important scenic recreational, fish and wildlife and other values		