

CHAPTER 21--SOLID AND HAZARDOUS WASTE

Student: _____

1. What percentage of e-waste components contain materials that could be recycled or reused?
 - A. 20
 - B. 40
 - C. 60
 - D. 80
 - E. 15
2. Much of the e-waste in the United States not buried or burned is
 - A. dismantled and reused
 - B. recycled
 - C. stored in warehouses
 - D. crushed and used as construction material
 - E. shipped to Asia or Africa
3. Which of the following industrialized nations has not signed the International Basel Convention to reduce and/or control movement of hazardous e-waste across international boundaries?
 - A. Canada
 - B. United States
 - C. Japan
 - D. South Korea
 - E. European Union
4. Waste that includes paper, food wastes, cans, bottles, yard waste, glass, wood, and similar items is called
 - A. industrial solid waste
 - B. hazardous waste
 - C. municipal solid waste
 - D. toxic solid waste
 - E. ewaste
5. Hazardous waste includes radioactive wastes which will have to be stored safely for as long as
 - A. 15,000 years
 - B. 50,000 years
 - C. 100,000 years
 - D. 240,000 years
 - E. 1,000,000 years

6. What percentage of solid and hazardous waste represent a violation of the chemical cycling sustainability principle?
- A. 33%
 - B. 50%
 - C. 67%
 - D. 75%
 - E. 90%
7. With 4.6% of the world's population, the United States produces about ____ of the world's solid waste.
- A. one-tenth
 - B. one-fifth
 - C. one-third
 - D. one-fourth
 - E. one-half
8. How much solid and liquid wastes is created for each one pound of electronics contained in a desktop computer?
- A. 4 tons
 - B. 1,000 pounds
 - C. 500 pounds
 - D. 250 pounds
 - E. 10 pounds
9. Solid waste produced directly by households and businesses amounts to ____% of the solid waste produced in the United States.
- A. less than 2
 - B. 5
 - C. 10
 - D. 15
 - E. 20
10. The amount of solid waste produced in the United States each year would fill a convoy of garbage trucks stretching around the world almost
- A. 2 times
 - B. 4 times
 - C. 6 times
 - D. 8 times
 - E. 10 times

11. One way to deal with the creation of solid wastes is to reduce the environmental impact without trying to reduce the amount of waste produced. This is called
- A. waste reduction
 - B. waste recycling
 - C. secondary pollution prevention
 - D. primary pollution prevention
 - E. integrated waste management
12. One way to deal with the creation of solid wastes begins with the question “how can we avoid producing so much solid waste?” This approach is called
- A. waste reduction
 - B. waste recycling
 - C. secondary pollution prevention
 - D. primary pollution prevention
 - E. integrated waste management
13. The recycling and composting rate of U.S. municipal solid waste is about
- A. 7%
 - B. 14%
 - C. 25%
 - D. 32%
 - E. 54%
14. ____ percent of the solid waste produced in the United States is buried in landfills.
- A. Ninety-eight
 - B. Fifty-four
 - C. Forty-eight
 - D. Thirty-eight
 - E. Forty
15. In an integrated waste management approach to solid waste, which of the following would be given *last* priority?
- A. compost
 - B. reuse
 - C. reduce packaging
 - D. bury
 - E. recycle

16. Taking a refillable coffee cup to the office and using it instead of throwaway cups is an example of ____.
- A. refuse
 - B. reduce
 - C. reuse
 - D. repurpose
 - E. recycle
17. Which of the following is the *least* desirable from an environmental standpoint?
- A. refuse
 - B. reduce
 - C. reuse
 - D. repurpose
 - E. recycle
18. Using a combination of strategies, as much as ____ of solid and hazardous waste could be eliminated through reduction, reuse, and recycling.
- A. 5-10%
 - B. 15-25%
 - C. 25-50%
 - D. 65-80%
 - E. 75-90%
19. Which of the following is not one of the strategies that industry and communities could use to reduce resource use, waste, and pollution?
- A. redesign manufacturing processes to use less material and energy
 - B. redesign landfills
 - C. redesign products to be easier to repair, reuse and manufacture
 - D. reduce or eliminate packaging
 - E. establish cradle-to grave laws for computers, electronic equipment, appliances
20. Which of the following is something each person can do to save resources.
- A. buy things that are reusable, recyclable, or compostable
 - B. use e-mail or text messaging in place of paper mail
 - C. buy products in bulk or concentrated form when possible
 - D. avoid disposable items such as plastic cups, plates, eating utensils
 - E. all of these are things each person can do

21. Which of the following is *not* an advantage of reusing items over and over?
- A. cuts waste
 - B. creates local jobs
 - C. cuts greenhouse gases
 - D. reduces bacterial infections
 - E. saves money
22. Using PET (polyethylene terephthalate) plastic bottles accomplishes all of the following *except*
- A. saves energy
 - B. reduces carbon dioxide emissions
 - C. totally eliminates need for recycling
 - D. reduces water pollution
 - E. reduces solid waste
23. How many U.S. states have bottle laws?
- A. 1
 - B. 6
 - C. 10
 - D. 22
 - E. 50
24. Less than ____ percent of the 100 billion plastic bags used in the United States each year are recycled.
- A. 30
 - B. 25
 - C. 18
 - D. 5
 - E. 1
25. The *most* energy-efficient beverage container on the market is
- A. refillable glass
 - B. recyclable aluminum
 - C. stainless steel
 - D. recyclable plastic
 - E. carton
26. At the checkout counter, an environmentalist is most likely to
- A. say "Plastic please."
 - B. say "Paper please."
 - C. say "I brought my own bag."
 - D. walk out of the store.
 - E. say "Either plastic or paper."

27. Municipal composting facilities in the United States recycle approximately ____% percent of the country's yard wastes, which is approximately ____% percent of the total Municipal Solid Waste.
- A. 10, 2
 - B. 22, 4
 - C. 31, 6
 - D. 37, 8
 - E. 43, 10
28. Currently, the United States recycles about ____ of all its wastepaper.
- A. 15%
 - B. 23%
 - C. 49%
 - D. 56%
 - E. 67%
29. Consumers of recycled products are most effective when they maximize the amount of ____ waste in the products they buy.
- A. pre-producer
 - B. post-producer
 - C. pre-consumer
 - D. post-consumer
 - E. producer
30. Some scientists suggest biodegradable conventional plastics promotes which of the following problems?
- A. carbon dioxide releases
 - B. methane releases
 - C. toxic chemicals in the groundwater
 - D. throwing away rather than recycling
 - E. large energy expenditures
31. Which of the following is *not* a strategy for encouraging reuse and recycling?
- A. decrease subsidies and tax breaks for using virgin resources
 - B. increase the use of fee-per-bag waste collection systems
 - C. require government purchasing of recycled products
 - D. pass laws requiring companies take back and recycle packaging
 - E. encourage the shipping of hazardous waste to poor countries

32. In order for an incinerator to be a safe alternative for waste disposal all of the following must be done, *except*
- A. Find a use for the heat generated.
 - B. Control release of CO₂.
 - C. Monitor for toxic metals.
 - D. Monitor and remove toxic fly ash.
 - E. Dispose of hazardous materials in an approved landfill.
33. Which of the following is true about waste-to-energy incineration?
- A. inexpensive to build
 - B. produces no hazardous waste
 - C. produces no air pollution
 - D. concentrates hazardous substances into ash
 - E. discourages waste production
34. Sanitary landfills typically have problems with
- A. rodents and insects
 - B. odor
 - C. open, uncovered garbage
 - D. traffic, noise, and dust
 - E. spread of disease
35. The second law of thermodynamics makes it important that which of the following rules is followed for landfills?
- A. don't bury organic material
 - B. don't produce dust or noise
 - C. don't mix different types of waste you may want to separate later
 - D. don't use available land for landfills
 - E. don't use filled land for other purposes
36. All of the following are means of detoxifying hazardous and toxic wastes, *except*
- A. phytoremediation
 - B. crushing and grinding
 - C. bioremediation
 - D. nanomagnets
 - E. chemical methods

37. Hazardous waste can be concentrated by using surface impoundments, lined ponds or lagoons. However, EPA has found that what percentage of these impoundments in the U.S. have no liners?
- A. 3
 - B. 15
 - C. 25
 - D. 70
 - E. 90
38. Which of the following is a disadvantage of using a plasma torch to detoxify hazardous waste?
- A. mobility
 - B. toxic ash production
 - C. cost
 - D. production of SO_2 gas
 - E. low energy use
39. Which of the following methods uses natural or genetically engineered plants to absorb, filter, and remove contaminants from soil and water?
- A. phytoremediation
 - B. physical methods
 - C. bioremediation
 - D. nanomagnets
 - E. chemical methods
40. Which of the following is the most common method of storage of hazardous wastes used in most countries of the world?
- A. burial at sea
 - B. above ground tanks
 - C. inside plants and warehouses
 - D. land burial
 - E. glassification
41. Which of the following is not a disadvantage of deep-well disposal of liquid hazardous wastes?
- A. limited number of sites
 - B. leakage into groundwater
 - C. encourages waste production
 - D. emits carbon dioxide and other air pollutants
 - E. wastes can often be retrieved

42. Of the following methods of dealing with hazardous wastes, the *most* desirable is
- A. incineration
 - B. conversion to less hazardous materials
 - C. perpetual storage
 - D. deposit in ocean trenches
 - E. recycling and reusing hazardous wastes
43. What percentage of the hazardous waste produced in the U.S. is regulated by the Resource Conservation and Recovery Act?
- A. 5%
 - B. 10%
 - C. 15%
 - D. 20%
 - E. 25%
44. A disproportionate share of polluting factories, hazardous waste dumps, incinerators, and landfills in the U.S. are located in communities populated by all of the following, *except*
- A. African Americans
 - B. Asian Americans
 - C. Caucasians
 - D. Latinos
 - E. working poor
45. In 1989 an international treaty called the Basel Convention banned developed countries from shipping hazardous waste to developing countries. Which of the following countries has not ratified the treaty?
- A. Lithuania
 - B. Burkina Faso
 - C. Cuba
 - D. Democratic Republic of Congo
 - E. United States
46. Which of the following principles does *not* contribute to a transition to a low-waste society?
- A. Economic growth and free markets reduce waste.
 - B. Everything is connected.
 - C. There is no "away."
 - D. Polluters and producers should pay for the wastes they produce
 - E. We can mimic nature by reusing, recycling, composting

47. Industrial biomimicry provides all of the following economic benefits for businesses, *except*
- A. reduce the costs of managing solid wastes
 - B. increases sales of all products regardless of hazardous nature
 - C. reduces chances of being sued
 - D. improves health and safety of workers
 - E. encourages better consumer image of the company
48. The fastest growing solid waste problem in the U.S. and in the world is ewaste.
- True False
49. The European Union has an approach to ewaste, known as the cradle-to-grave approach, which requires manufacturers to provide health benefits from cradle-to-grave.
- True False
50. About 98.5% of all solid waste in the United States is industrial solid waste.
- True False
51. In 2008 the largest category of MSW before recycling was plastics.
- True False
52. Most environmental scientists call for a much greater emphasis on waste reduction than waste disposal.
- True False
53. Integrated Waste Management involves using strategies for waste disposal and waste reduction.
- True False
54. Newspapers from 50 years ago are still readable may still be readable because trash can resist decomposition for centuries if it is not exposed to air, sunlight, water, and bacteria.
- True False
55. Some scientists and economists doubt that much solid waste could be eliminated by prioritizing strategies in a coordinated effort.
- True False
56. Reusing products can be a health hazard for the poor in developing countries who dismantle products with hazardous materials to extract usable parts.
- True False

57. Large beverage industries have used their political and financial clout to force most U.S. states to pass bottle bills.
- True False
58. Plastics are routinely recycled because they are composed of pure resins that can be extracted and used for other plastic products.
- True False
59. Large companies make more money by producing and shipping throwaway beverage and food containers from centralized facilities.
- True False
60. Plastic bags can help spread malaria by providing mini-pools of water where mosquitoes can breed.
- True False
61. Bottle laws, where a deposit fee is placed on all beverage containers, leads to a loss of jobs and higher beverage costs.
- True False
62. Materials-recovery facilities (MRF) encourage people to produce more trash.
- True False
63. If every U.S. household used just one 500-sheet roll of toilet paper made from 100% recycled paper in place of a roll made from virgin timber, 425,000 trees would be saved each year.
- True False
64. Newspaper and cardboard are difficult to recycle.
- True False
65. It is currently impossible to separate plastics from each other by type and grade in a mixed waste stream.
- True False
66. Recycling and composting of 33% of all the MSW in the U.S. reduced carbon dioxide emissions by an amount equivalent to removing the emissions of 33 million passenger cars.
- True False
67. The products of composting can be used to slow soil erosion, retain water, and improve crop yields.
- True False

68. Modern waste-to-energy incinerators produce lower emissions of greenhouse gases and other air pollutants than do modern landfills.
- True False
69. The incineration of hazardous wastes is quick, conserves space, and reduces waste volume but is not used because of the increased water pollution that results.
- True False
70. At sanitary landfills, consideration of leachate is of most importance as far as environmental preservation is concerned.
- True False
71. The National Priorities List identifies hazardous waste sites, with clean up of these sites based on priority and severity.
- True False
72. The Waste Management Research Institute estimates that at least 10,000 sites should be on the National Priorities List instead of the current 1,300.
- True False
73. Burial or long-term storage of hazardous waste is the first priority for environmental scientists.
- True False
74. NOPE calls for drastically reducing production of toxic and hazardous wastes by emphasizing pollution prevention and using the precautionary principle.
- True False
75. No country has yet to ban persistent organic pollutants.
- True False
76. The best and cheapest ways to deal with solid and hazardous wastes are waste reduction and pollution prevention.
- True False
77. It is likely that every person on earth has detectable levels of Persistent Organic Pollutants (POPs) in their body.
- True False

78. _____ is the fastest-growing solid waste problem in the United States and in the world.

79. _____ is the combined solid waste produced by homes and workplaces.

80. Eighty to ninety percent of all hazardous waste is produced by _____ countries, with the United States as the largest producer.

81. The two largest classes of hazardous wastes are _____ and _____.

82. Most analysts call for using _____ - a variety of strategies for both waste reduction and waste management.

83. From an environmental standpoint, the first two Rs, _____ and _____, are better alternatives because they are input or prevention approaches.

84. A _____ waste collection system charges consumers for the amount of waste they throw away.

85. _____ laws require companies to take back various consumer products instead of having them put in landfills or incinerated.

86. Refillable soft drink bottles made of _____ plastic can make as many as 15 round-trips before being recycled.

87. _____ are inefficient because they are expensive to build, discharge toxic emissions, and can produce a toxic ash.

88. _____ occurs when waste is made into new products of the same type.

89. Ponds, pits, or lagoons into which liners are placed and liquid hazardous wastes are stored are called _____.

90. _____ is a form of recycling that mimics nature's recycling of nutrients.

91. Of the two types of recyclable waste, _____ waste makes up more than three-fourths of the total.

92. Despite recycling 49% of its paper, the U.S. throws away more paper than all of the paper used in _____.

93. About 54% by weight of MSW in the U.S. is buried in _____ which have liner containment systems on the sides and bottom.

94. _____ incinerators produce less greenhouse gases and other air pollutants than do modern landfills.

95. One third of industrial hazardous wastes in the European Union are sold as _____ for use by other industries..

96. _____ involves using natural or genetically engineered plants to absorb, filter, and remove contaminants.

97. The U.S. has passed laws to facilitate the cleanup of abandoned, contaminated industrial sites, known as _____.

98. Because of a mineral called coltan cell phones are a threat to the endangered _____.

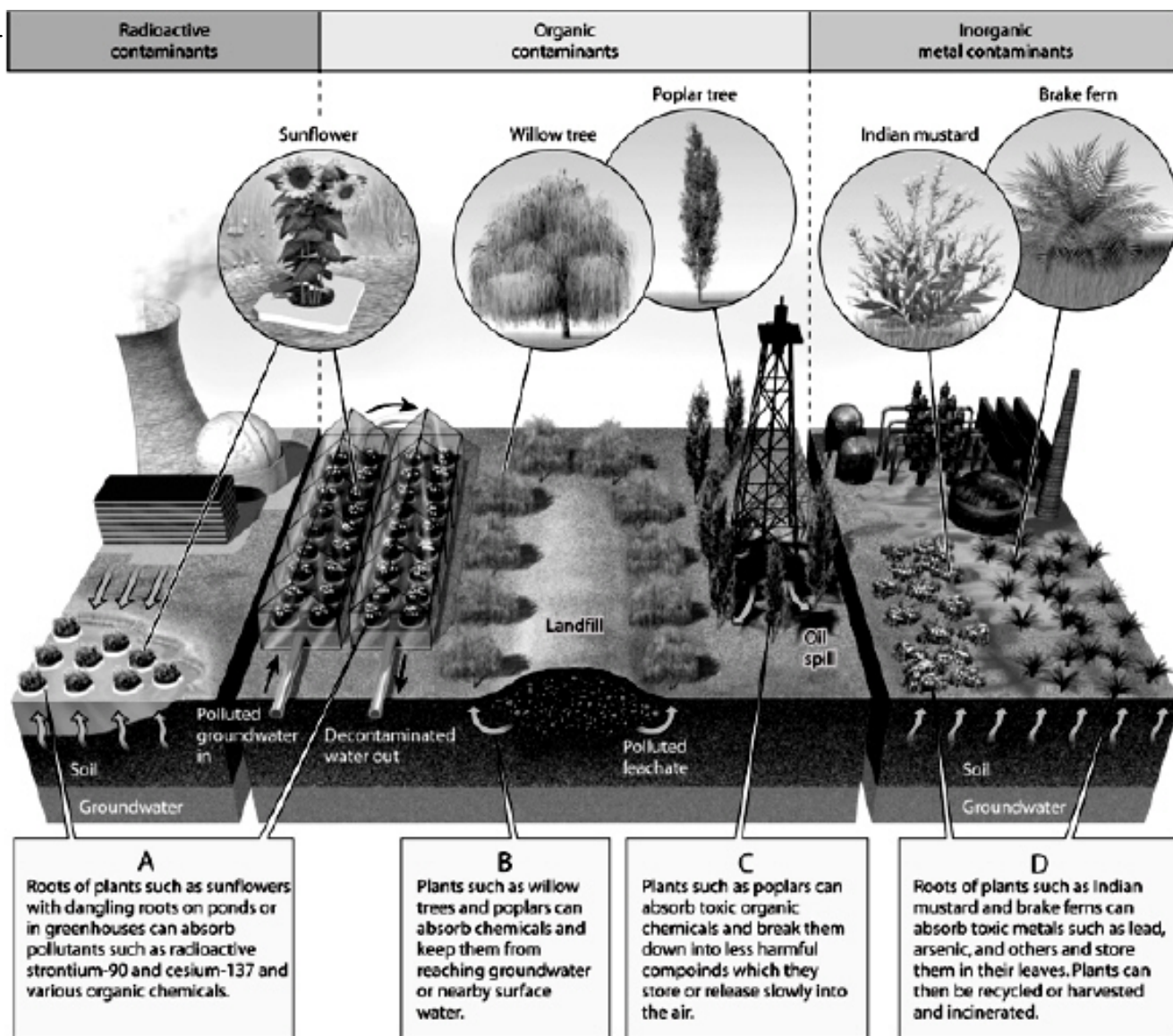
99. In the United States, the _____ regulates only a small percentage of all hazardous waste.

100. _____ utilizes bacteria and enzymes instead of plants to filter or destroy hazardous substances.

101. _____ is an ideal where every person is entitle to protection from environmental hazards regardless of race, gender, or other factors.

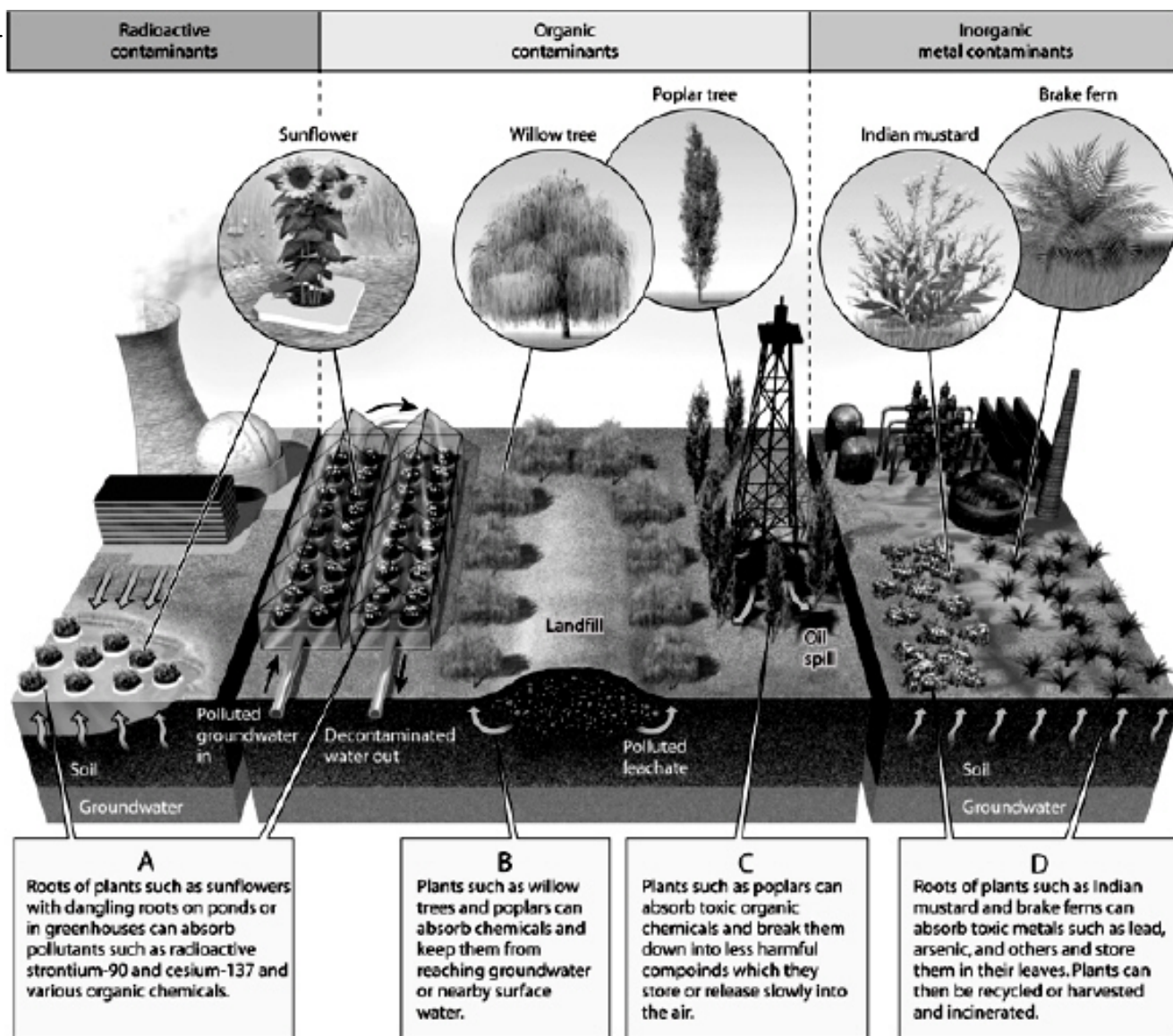
102. _____ is the science and art of discovering and using natural principles t help solve human problems.

103.



Use the Figure above to answer the following question(s).

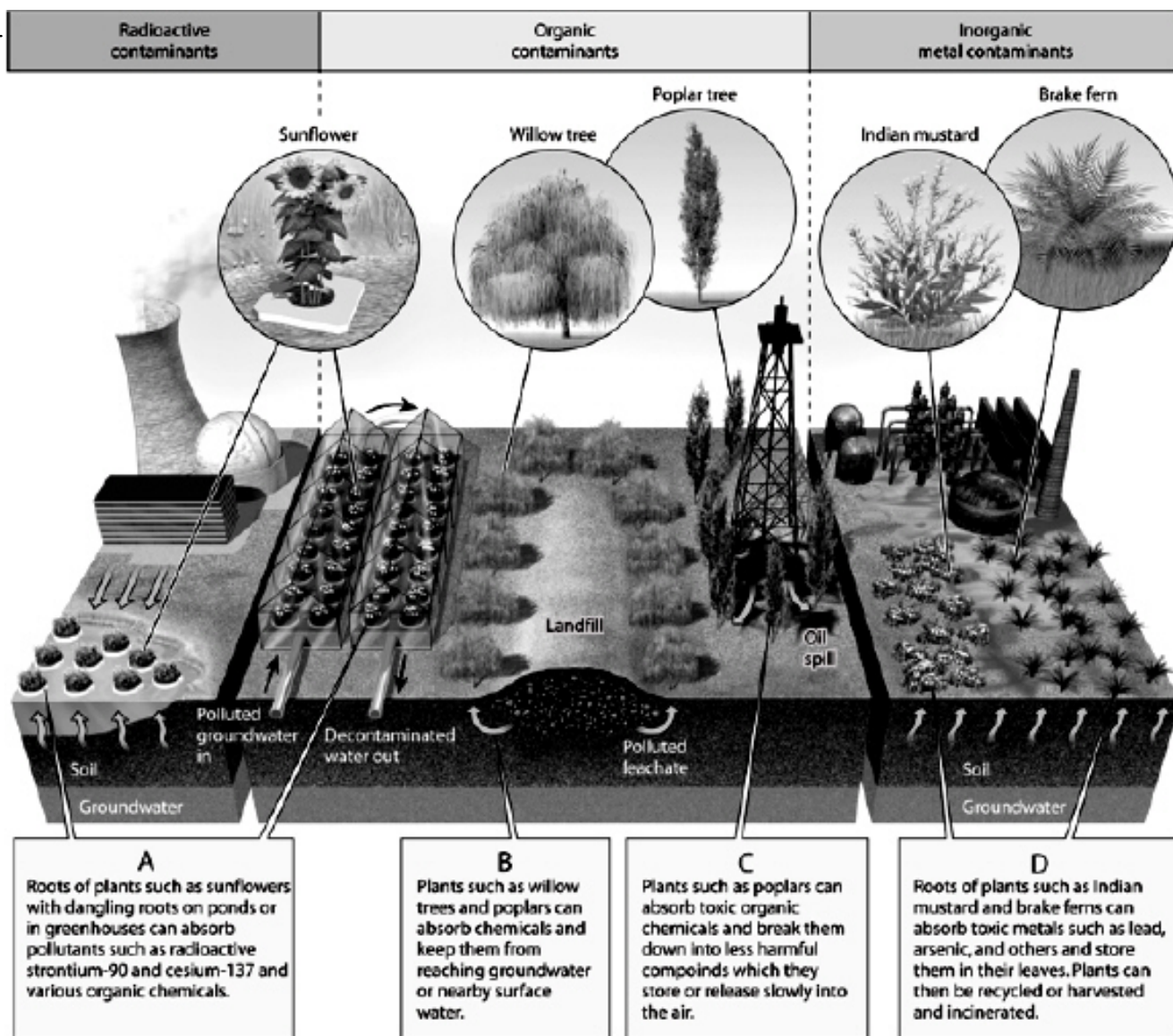
Choose the letter that represents phytostabilization.



Use the Figure above to answer the following question(s).

Choose the letter that represents phytoextraction.

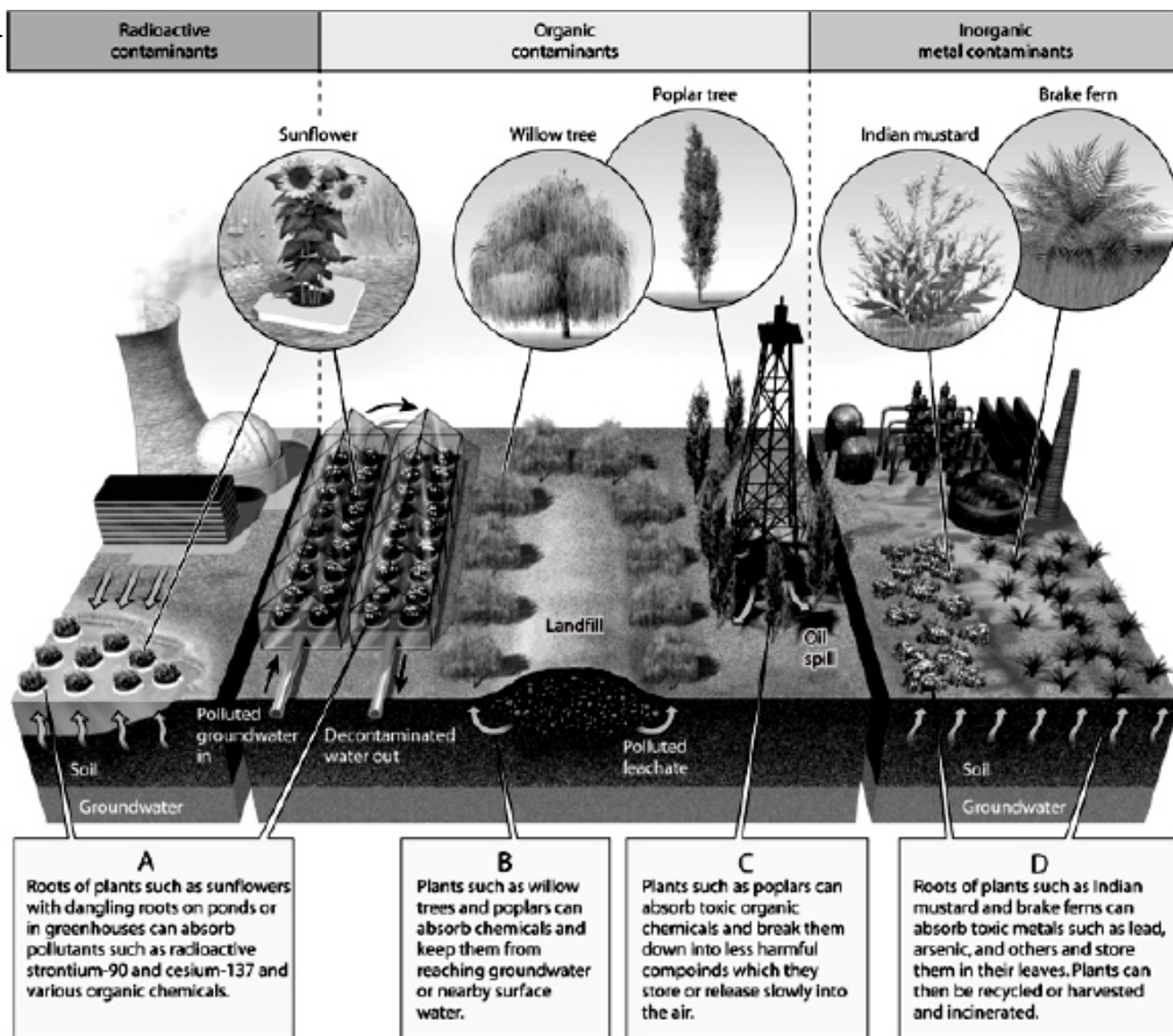
105.



Use the Figure above to answer the following question(s).

Choose the letter that represents rhizofiltration.

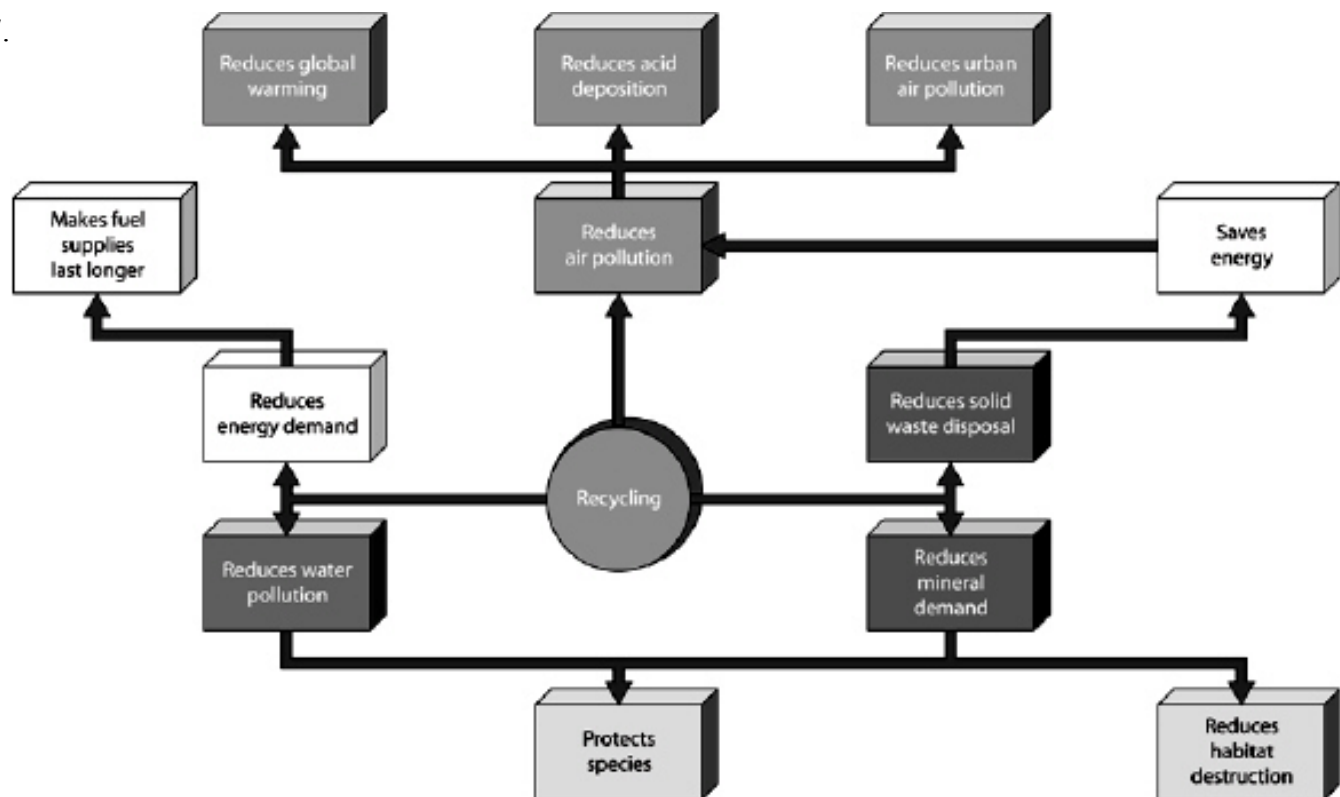
106.



Use the Figure above to answer the following question(s).

Choose the letter that represents phytodegradation.

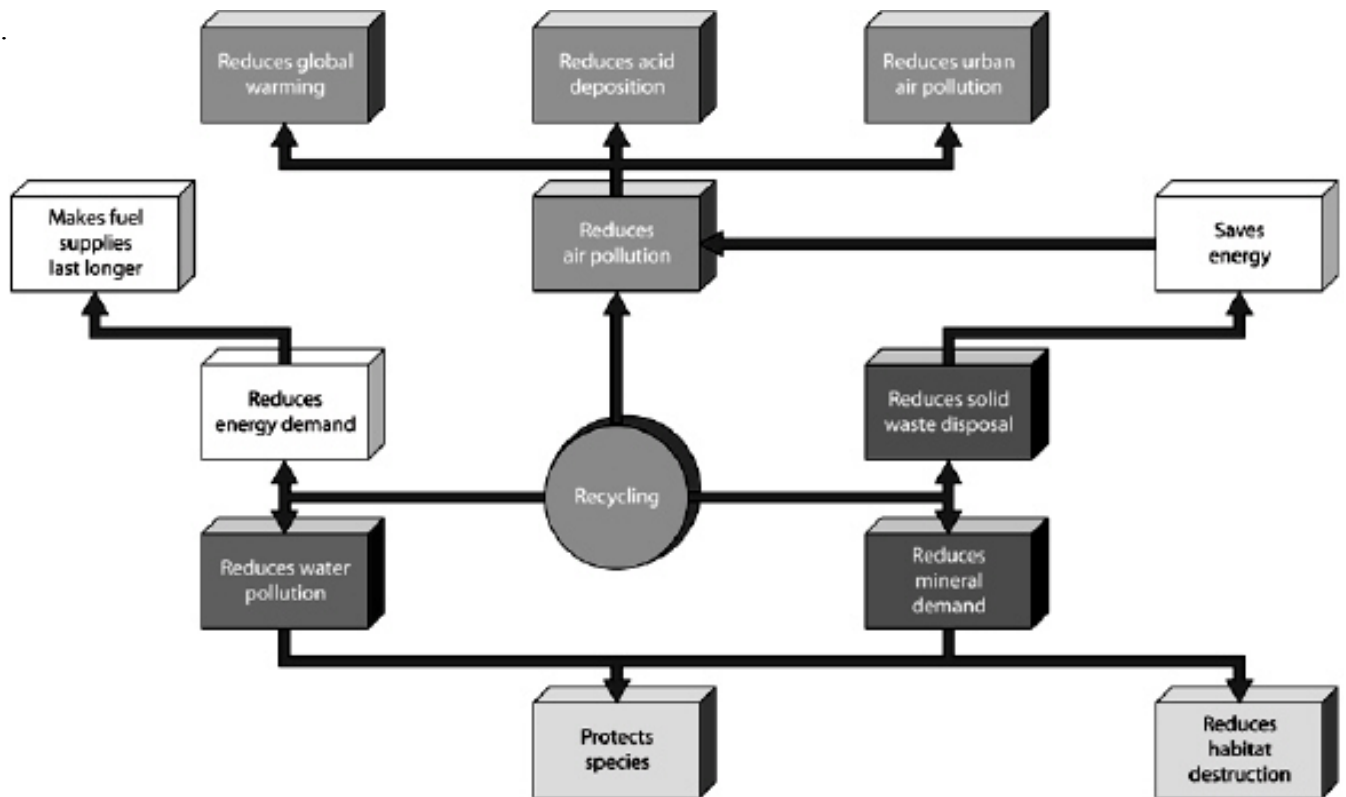
107.



Use the Figure above to answer the following question(s).

Why is recycling an output approach for environmental concerns?

108.



Use the Figure above to answer the following question(s).

Explain how recycling reduces energy demand and makes fuel supplies last longer.

CHAPTER 21--SOLID AND HAZARDOUS WASTE Key

1. D
2. E
3. B
4. C
5. D
6. D
7. C
8. A
9. A
10. D
11. E
12. A
13. D
14. B
15. D
16. C
17. E
18. E
19. B
20. E
21. D
22. C
23. C
24. E
25. A
26. C
27. D
28. C
29. D
30. D

- 31. E
- 32. A
- 33. D
- 34. D
- 35. C
- 36. B
- 37. D
- 38. C
- 39. A
- 40. D
- 41. E
- 42. E
- 43. A
- 44. C
- 45. E
- 46. A
- 47. B
- 48. TRUE
- 49. FALSE
- 50. TRUE
- 51. FALSE
- 52. TRUE
- 53. TRUE
- 54. TRUE
- 55. FALSE
- 56. TRUE
- 57. FALSE
- 58. FALSE
- 59. TRUE
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- 61. FALSE
- 62. TRUE
- 63. TRUE
- 64. FALSE

- 65. FALSE
- 66. TRUE
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- 68. TRUE
- 69. FALSE
- 70. TRUE
- 71. FALSE
- 72. TRUE
- 73. FALSE
- 74. TRUE
- 75. FALSE
- 76. TRUE
- 77. TRUE
- 78. Ewaste
- 79. Municipal solid waste
- 80. more-developed
- 81. organic compounds; toxic heavy metals *or* toxic heavy metals; organic compounds
- 82. integrated waste management
- 83. reduce; reuse *or* reuse; reduce
- 84. fee-per-bag
- 85. Cradle-to-grave
- 86. polyethylene terephthalate *or* PET
- 87. Materials-recovery facilities *or* MRF
- 88. Primary recycling *or* Closed-loop recycling
- 89. surface impoundments
- 90. Composting
- 91. preconsumer, *or* internal
- 92. China
- 93. sanitary landfills
- 94. Waste-to-energy
- 95. raw materials
- 96. Phytoremediation
- 97. brownfields
- 98. gorilla, *or* mountain gorilla, *or* African gorilla

99. Resource Conservation and Recovery Act

100. Bioremediation

101. Environmental justice

102. Biomimicry

103. B

104. D

105. A

106. C

107. Recycling deals with wastes already produced and harmful to the environment. The wastes are the outputs. Prevention of waste production or reduction of wastes is the best approach. Recycling usually reduces pollution and waste production.

108. Recycling uses oil products like tires for other applications. Waste generated in manufacturing a product, for example heat, can be used to warm the manufacturer's water, etc.