

Team Name _____ Team Number _____

Green Generation Test

Camas High School Invitational

Division B

A couple of reminders:

1. Teams are only permitted ONE 8.5" X 11" page of notes and any kind of graphing calculator. Teams may not use any other resources, or risk disqualification. **If you do have extra stuff, put it on one of the side tables.**
2. You may separate the test, but make sure to reattach the test **in order** before sending it in and/or putting the team name and number on top of all pages. Putting them in order will make the tests much easier to grade.
3. This is a long test. I recommend splitting the workload between the two of you.
4. You will have 50 minutes to complete the test. You may turn your test in early, but time turned in will not be used as a tiebreaker.
5. **DO NOT FORGET** to put your team name and number on EACH page of the test.
6. Make sure to thoroughly read the questions. On free response, answer ALL questions asked for full points. The points a question is worth is stated.
7. Make sure to plan out your time wisely. There are three types of questions on this test - multiple choice, fill in the blank, and free response. Look through to see how many questions/what types of questions before you go charging into it.
8. Once you are done, hand your tests in to me.

Good luck!

Score _____

Place _____

Team Name _____ Team Number _____

Part I: General Review of the Principles of Ecology

Multiple Choice: Circle the best answer. (1 point each)

- 1) Which of the following constitutes roughly 78% of the earth's atmosphere?
 - a.) Nitrogen
 - b.) Oxygen
 - c.) Water vapor
 - d.) Carbon dioxide

- 2.) What role does a keystone species play in an ecosystem?
 - a.) Provides the base of the food pyramid as prey on which many species feed
 - b.) Is the highest predator on the trophic pyramid
 - c.) Keeps other elements of the ecosystem in check, and is necessary for the health of the ecosystem
 - d.) A widely distributed and environmentally sensitive species that may be used to show the pollution levels of an area with its presence

- 3.) What does the tragedy of the commons describe?
 - a.) the disaster of climate change if we do not halt pollution into the atmosphere
 - b.) the philosophy that if there is something public, nobody will care for it unless there are regulations or it is privately owned.
 - c.) the philosophy that the connectivity of the modern world will lead to the pollution and degradation of ecosystems globally, not just locally
 - d.) the social stratification that leaves the "common man" living in areas that have been environmentally degraded by the wealthy upper class

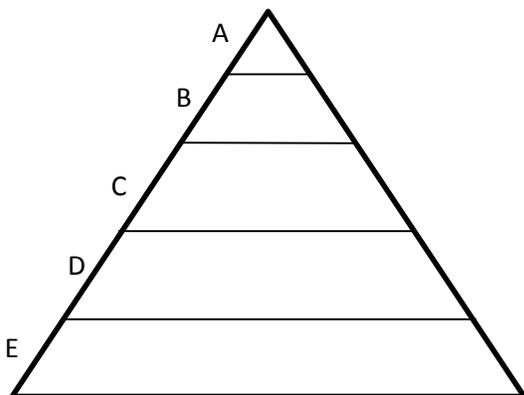
- 4.) Which part of the water cycle involves water evaporating from leaves and plants?
 - a.) evaporation
 - b.) condensation
 - c.) sublimation
 - d.) transpiration

- 5.) What is the primary greenhouse gas in the earth's atmosphere?
 - a.) Carbon dioxide (CO₂)
 - b.) Water vapor (H₂O)
 - c.) Methane (CH₄)
 - d.) Nitrous oxide (N₂O)

- 6.) Which of the following describes an ecological interaction in which one species benefits and the other species is neither harmed nor helped?
 - a.) Commensalism
 - b.) Predation
 - c.) Parasitism
 - d.) Mutualism

Team Name _____ Team Number _____

Use the diagram below for problems 7-12.



This is a diagram of the trophic pyramid. Match the letter with the name of the level. Then answer the question.

- 7.) Primary producer
- 8.) Quaternary consumer
- 9.) Secondary consumer
- 10.) Tertiary consumer
- 11.) Primary consumers
- 12.) Which level (give the letter) would be most likely to be the most affected by biomagnification?
- 13.) A normal, healthy lake should have a pH of about...
 - a.) Just above 7
 - b.) Just below 7
 - c.) A little less than 6
 - d.) A little more than 8
- 14.) What is the importance of a buffer in lakes and waterways?
 - a.) It is necessary for the flora and fauna to survive
 - b.) It keeps the pH of the water more stable from acid intrusion
 - c.) It prevents the surrounding rock from eroding too fast
 - d.) Provides better conditions for algae growth
- 15.) The habitat, feeding habits, and role an animal plays in an ecosystem is called its...
 - a.) fundamental niche
 - b.) realized niche
 - c.) potential niche
 - d.) corner

Team Name _____ Team Number _____

16.) What type of biome is the most likely to have the greatest species diversity?

- a.) deciduous forest
- b.) boreal forest
- c.) tropical rain forest
- d.) temperate rain forest

17.) What is the approximate salinity of an estuary?

- a.) 3% salt
- b.) 8% salt
- c.) impossible to tell
- d.) depends on time and location

Short Response: Answer the following questions with no more than 3 sentences. (points vary)

18.) Explain why there are less organisms on each increasing level of the trophic pyramid. (2 points)

19.) Define carrying capacity (2 points)

20.) Define and give an example of point source pollution (4 points)

21.) Explain how roughly 90% of energy is lost moving up the food chain. (Hint: look at #18 again) (2 points)

Team Name _____ Team Number _____

22.) Draw and label a diagram of the carbon cycle. (4 points)

23.) What is the biggest carbon sink in the world? (2 points)

Part II: Human Impacts

Multiple Choice: Circle the best answer. (1 point each)

24.) One chlorofluorocarbon molecule has been estimated to be able to destroy...

- a.) One hundred ozone molecules
- b.) One thousand ozone molecules
- c.) One hundred thousand ozone molecules
- d.) One million ozone molecules

25.) What is the approximate pH of normal, clean rain?

- a.) About 5.6
- b.) Less than 5.6
- c.) Just below 7
- d.) Just above 7

26.) What is the approximate pH of acid rain?

- a.) About 5.6
- b.) Less than 5.6
- c.) Just below 7
- d.) Just above 7

27.) Which of the following is NOT a greenhouse gas?

- a.) Methane
- b.) Carbon dioxide
- c.) Carbon monoxide
- d.) Water vapor

Team Name _____ Team Number _____

28.) The West coast is monitoring its water for radioactivity. What is the primary cause for this concern?

- a.) Chernobyl
- b.) Three Mile Island
- c.) Hanford Nuclear Site
- d.) Fukushima Daiichi

Fill in the blank: Fill in the blank with the appropriate word. (2 points each)

29.) The water that washes through landfills, also known as _____, is tested for toxins as well as suspended and dissolved materials before being purified and returned to the ecosystem.

30.) _____ is the term used to describe the amount of species and their richness. Is usually the highest near the equator.

31.) The nonliving elements of an ecosystem, or the _____ components, include the weather, rocks, water, and soil, among other things.

32.) A(n) _____ is usually defined as all of the living and nonliving components within an area. This also encompasses the relationships between species and the environment.

Short Response: Answer the following questions with no more than 3 sentences. (Points vary)

33.) What is albedo and what does it have to do with climate change? (4 points)

34.) Explain the greenhouse effect. (2 points)

Team Name _____ Team Number _____

35.) Explain the difference between a mutagen and a carcinogen and give an example of each. (4 points)

Part III: Solutions and Sustainability

Multiple Choice: Circle the best answer for each question. (1 point each)

- 36.) Which of the following means the cleanup of pollutants using organisms?
- a.) biocide
 - b.) biomagnification
 - c.) adaptive management
 - d.) bioremediation
- 37.) Which federal act (made in 1973) aimed to protect imperiled species?
- a.) Comprehensive Environmental Response, Compensation, and Liability Act
 - b.) National Environmental Policy Act
 - c.) Endangered Species Act
 - d.) Pollution Prevention Act
- 38.) Which law, (passed in 1972) restricted the use of DDT?
- a.) Pollution Prevention Act
 - b.) National Environmental Policy Act
 - c.) Resource Conservation and Recovery Act
 - d.) Federal Insecticide, Fungicide and Rodenticide Act
- 39.) Which bird recovered from the brink of extinction as a result of this law (from question 38)?
- a.) Bald eagle
 - b.) Ring-Billed Seagulls
 - c.) Red Pileated Woodpecker
 - d.) All of the above
- 40.) Which of the following is NOT a renewable resource?
- a.) solar
 - b.) wind
 - c.) nuclear
 - d.) hydropower

Team Name _____ Team Number _____

Directions: Match the letters of the problems with the correct numbers and energy resources. (1 point each)

- A. Causes an increased number of earthquakes
- B. Uses fracking, which sometimes releases toxins into groundwater. Also releases methane.
- C. Relies upon natural gas because hydrolysis is not yet efficient
- D. Is only efficient in areas with low cloud cover and long days
- E. Requires the construction of dams, which present environmental impacts
- F. Releases toxins like sulfur dioxide, nitrogen oxides, particulate matter, and mercury
- G. Nonrenewable resource, needs extensive drilling and releases CO₂ into the atmosphere.
Traditional form of fossil fuels in America.
- H. Uses uranium, which requires mining. Also produces radioactive waste.

- 41.) Solar power
- 42.) Hydropower
- 43.) Geothermal energy
- 44.) Hydrogen fuel cells
- 45.) Natural gas
- 46.) Coal
- 47.) Nuclear power
- 48.) Oil

Free Response: Answer the following questions using no more than 4 sentences.

49.) What are the environmental impacts of hydroelectric dams? List 2. (4 points)

50.) What is the main purpose of the Kyoto Protocol? (2 points)

Team Name _____ Team Number _____

Tiebreaker: Describe phytoremediation and bioremediation, and then give an example of situations in which they may be used. (4 points)

51.) Describe 3 ways in which you could make your house more sustainable and efficient. Be descriptive and realistic, these may be things that you could actually do. (4 points)

52.) Describe the difference between active and passive solar energy. (2 points)