

Team # _____

Current Issue

2007 California Envirothon
Current Issue Station Test
Total Points= 100

Please write your team number on the top of each page. You may unstaple the test and work on the questions in any order: however, pages should be returned to the correct order when the test is turned in. You may choose to split your team and work on several questions at once or work on them together. For multiple-choice questions, mark the letter that describes the best answer or complete the sentence most accurately. For True or False questions, circle the "True" only if the statement is completely true. Please show all work or thought process, as you may receive partial credit.

1. Differentiate between renewable and nonrenewable energy? (5 points)

2. How does renewable energy help our economy? (5 points)

http://www.epa.gov/greenkit/q5_energ.htm

3. List three renewable energy sources. For each source, list two pros and two cons related to that technology. (9 points)

<http://www.eere.energy.gov/>

4. True/False - Energy from biomass is typically created when the starch and sugars of a plant are converted to ethanol. The US Department of Energy's Biomass Program is currently looking at how to create energy from the cellulose and hemi cellulose of plant tissue. (2 points)

<http://www1.eere.energy.gov/biomass/>

5. Why is creating ethanol from corn considered a non-sustainable technology leading to low biodiversity, damaged soils, and high transportation costs? (5 points)

6. True/False - Biodiesel does not perform as well as regular diesel, but since it is renewable it is still favorable. (2 points)

http://www.biodiesel.org/pdf_files/fuelfactsheets/Myths_Facts.pdf

7. Photovoltaics: (2 points)

a) absorb the sun's energy to provide low-temperature heat used directly for hot water or space heating for residential or commercial buildings

b) focus sunlight into a fiber optic system to illuminate building interiors with sunlight

c) use semiconductor materials that convert sunlight directly to electricity

d) use reflective materials that concentrate the sun's heat energy to drive a generator that produces electricity

<http://www1.eere.energy.gov/solar/photovoltaics.html>

8. Look at the picture below. In 2006, which country led the world in this energy capacity? _____ (2 points)

<http://www1.eere.energy.gov/windandhydro/>



9. What is B20? (3 points)

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http://www.biodiesel.org/pdf_files/fuelfactsheets/CommonlyAsked.PDF

10. List three energy sources that are constantly replenished and never run out. (2 points)

11. Hydrogen can be produced using: (2 points)

- a) Natural Gas Reforming
- b) Renewable Electrolysis
- c) Gasification
- d) Renewable Liquid Reforming
- e) All of the Above

http://www1.eere.energy.gov/hydrogenandfuelcells/pdfs/doe_h2_production.pdf

12. True/ False - Although Hydrogen has the potential to be a good alternative energy source in the United States; it is not currently used in any large amounts. (2 points)

http://www1.eere.energy.gov/hydrogenandfuelcells/pdfs/doe_h2_production.pdf

13. What the largest byproduct created when making biodiesel? (2 points)

- a) Yeast
- b) Acetic Acid
- c) Glycerin
- d) Oxygen

http://www.biodiesel.org/resources/biodiesel_basics/default.shtm

14. Describe geothermal energy production. How is it produced? Where in the United States is most of it produced? What part of the technology is unsustainable? (5 points)

<http://www1.eere.energy.gov/geothermal/faqs.html>

15. California Assembly Bill # _____ mandates that by 2020 California statewide greenhouse gas (“GHG”) emissions will be capped at 1990 levels, a significant reduction

from current levels (Cal Health & Safety Code § 38550). (3 points)

<http://www.arb.ca.gov/cc/factsheets/ab32factsheet.pdf>

16. The earth receives more energy from the sun in just one hour than the whole earth uses in: (2 points)

- a. One Day
- b. One week
- c. One month
- d. One year.

17. Match the word with the correct description listed below. (20 points)

1. Hydrogen ___	A) Can remain in the atmosphere for up to 200 years.
2. Tidal Generation ___	B) Using this form of illumination is one of the most effective ways to reduce energy consumption in residential houses.
3. Nuclear Energy ___	C) The City of Santa Rosa, CA. pipes its treated wastewater up to The Geysers Power Plant where the fluid is re-injected, helping to sustain this energy type.
4. Environmental Justice ___	D) Out of the two most common greenhouse gases, this is the most potent
5. Biofuels ___	E) A very clean and effective energy source, but disposal of the by-product is a huge problem
6. Compact Fluorescent Light bulbs ___	F) Something to take into consideration when analyzing how alternative energy development may impact minorities and low-income populations
7. Solar Energy ___	G) An energy carrier, not an energy source. This stores and delivers energy in a usable form, but must be produced from compounds that contain it.
8. Geothermal Energy ___	H) Currently, there are no US plants producing this type of power.
9. Methane ___	I) Anaerobic digestion of cow manure can create this type of energy source
10. Carbon Dioxide ___	J) This alternative energy source is nuclear in nature.

18. Discuss one alternative energy source and how it may affect wildlife biodiversity, soil erosion, water quality, and conservation practices. Be sure to include the energy type and how the technology specifically affects each of the four issues listed. (8 points)

19. If I were a farmer interested in growing corn to produce ethanol, I may be interested to see what type of soil my county has. I could do this by using the Web Soil Survey produced by: (2 points)

- a. US Environmental Protection Agency
- b. US Department of Fish and Game
- c. Natural Resources Conservation Service
- d. US Forest Service

<http://www.soils.usda.gov/survey/WSS-Brochure.pdf>

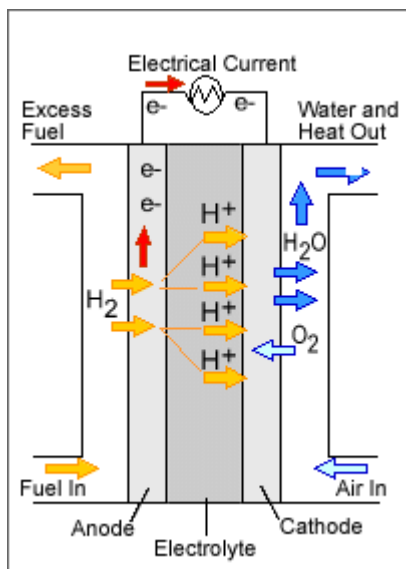
20. How does dependence on foreign oil affect homeland security? (8 points)

21. _____ is a highly efficient means of generating heat and electric power at the same time from the same energy source. (2 points)

http://www1.eere.energy.gov/biomass/biomass_basics_faqs.html

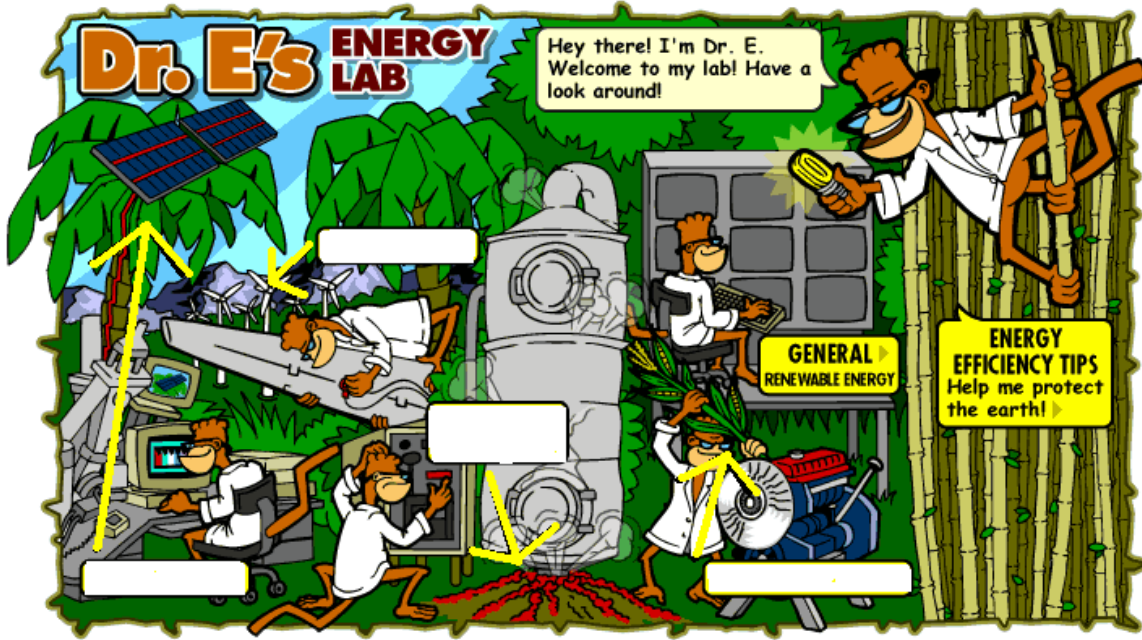
22. What is this? _____ (3 points)

http://www1.eere.energy.gov/hydrogenandfuelcells/fuelcells/fc_types.html



23. Fill in the blanks below with the renewable energy sources designated by the yellow arrows. (4 points)

<http://www1.eere.energy.gov/kids/>



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