**Post-Test** **Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Biofuel PBL Unit Class\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**26 Points Total Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**True or False: Write T for True or F for False in blank for each statement.**

1.\_\_\_\_\_\_\_\_\_The use of biofuels is better for the environment than use of fossil fuels since using fossil fuels releases greenhouse gases and pollutants.

2.\_\_\_\_\_\_\_\_\_\_A "flexible fuel" vehicle, such as driven in Belize, can use either biofuels or fossil fuels.

3.\_\_\_\_\_\_\_\_When something burns (when combustion occurs) energy is used up (oxidized or chemically combines with oxygen).

4.\_\_\_\_\_\_\_\_\_\_Building a new refinery is cheaper than converting an old refinery to biofuel use.

5.\_\_\_\_\_\_\_\_\_There is discussion now about how the environmental costs associated with making biofuels makes biofuel use not a better alternative to gasoline.

**Multiple Choice: Write in blank letter for best answer to each question.**

1. Where does the United States currently get most of its oil?
2. Canada & Latin America C. Iran
3. Antarctic D. Asia

2. Fossil fuels include diesel and gasoline. Biofuels include:

1. Natural gas C. Oil
2. Ethanol D. Coal
3. The amount of carbon has changed from the long-ago past to current time. What is NOT a change in the carbon life cycle?
4. Greatly reduced in the atmosphere
5. Greatly increased in the hydrosphere
6. Balanced in the biosphere
7. Greatly reduced in the lithosphere

 4. Greenhouse gasses include:

1. Carbon monoxide C. Sulfur
2. Oxygen D. Nitrogen oxide
3. Where does the mass of a plant come from?
4. Water C. carbon dioxide in the air
5. Sunlight D. minerals from the soil

 6. What is a reason why biodiesel fuel is good for vehicles?

1. Can be used, with little or no changes, in current diesel engines
2. Keeps engines well lubricated, so there is less wear and tear
3. Engine performance does not decrease
4. All of the Above

7.Given what you have learned about processing biomass into biofuel, which is the correct biofuel pathway?

1. Trees/grasses--ethanol/butanol--cellulose--enzymatic hydrolysis/fermentations
2. Ethanol/butanol--trees/grasses--cellulose--enzymatic hydrolysis/fermentations
3. Trees/gasses--cellulose--ethanol/butanol--enzymatic hydrolysis/fermentations
4. Trees/grasses--cellulose--enzymatic hydrolysis/fermentation--ethanol/butanol

 8. Why is biodiesel popular in rural areas?

1. Farmers can make biodiesel fuel and use it in their own machines
2. There are more refineries nearby so transportation of biodiesel fuel is easier
3. People in rural areas have a lot of grease left over after cooking, which can be used in biofuel production
4. In winter, people need something to do—why not make your own biofuel?
5. Photosynthesis is the process that converts light energy into chemical energy. Which is false:
6. Plants breathe in CO2
7. Light energy is the main source of energy on earth
8. Plants produce glucose
9. Plants give off CO2

 10. Ethanol can be made from:

1. Sugarcane C. Corn
2. Wheat D. All of the Above

11.Some characteristics of a good biofuel plant are:

1. Whole shoot can be used C. Crops also used for food
2. Easily used carbon D. Both A and B

**Matching: Write matching letter of item in front of correct number of item.**

|  |  |  |
| --- | --- | --- |
|  | 1. Enzyme
 | 1. C6H12O6  + 6O2 + Energy
 |
|  | 1. Respiration
 | 1. Crust & upper mantle of the earth; soil
 |
|  | 1. Lignin
 | 1. Amount of living matter in an area & a renewable resource
 |
|  | 1. Fermentation
 | 1. Nitrogen oxide and carbon dioxide
 |
|  | 1. Glucose
 | 1. Acts as a catalyst increasing rate of chemical reaction
 |
|  | 1. 6CO2 + 6H2O + light 🡪
 | 1. Part of plant cell wall that makes breakdown into biofuels more difficult
 |
|  | 1. Greenhouse gasses
 | 1. C6H12O6
 |
|  | 1. Fossil fuel
 | 1. Results in the breakdown of molecules, like carbohydrates
 |
|  | 1. lithosphere
 | 1. Sugar is broken down into energy
 |
|  | 1. biomass
 | 1. Oil, natural gas, & coal
 |

Sources:

<http://auto.howstuffworks.com/fuel-efficiency/biofuels/biofuels-crops-quiz.htm>

auto.howstuffworks.com/fuel-efficiency/biofuels/10-disadvantages-of-bi...‎

auto.howstuffworks.com/fuel-efficiency/biofuels/food-or-fuel-quiz.htm

auto.howstuffworks.com/fuel-efficiency/alternative.../biofuel-quiz.htm‎