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Initials

Environmental Literacy Carbon Assessment: --- High School Level, Form A ---

Science is easier to understand if you can make connections between what you know now and the new ideas that you are studying. This is a test that will help us to understand what you know now. Please answer these questions as carefully and completely as you can. If you are not sure of the answer, please write about any thoughts that you have. If you can help us to understand how you think about these questions, then we can do a better job of explaining science in ways that make sense to you.

Please put your initials (not your full name) in the boxes

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First Middle Last

Date _____

Class _____ Teacher _____

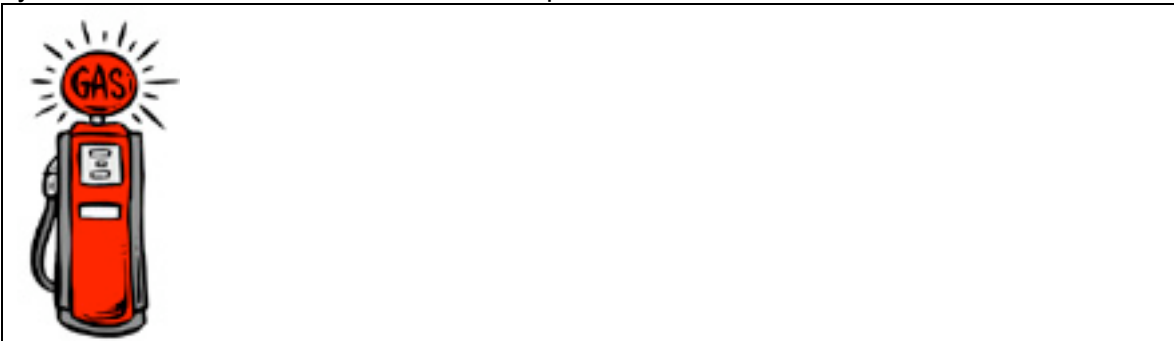
1. Sunlight helps plants to grow. Where does light energy go when it is used by plants? Please choose the ONE answer that you think is best.

- a. The light energy is converted into glucose of the plants.
- b. The light energy is converted into ATP in the plants.
- c. The light energy is used up to power the process of photosynthesis.
- d. The light energy becomes chemical bond energy.
- e. The light energy does not go into the plants' body.

Please explain why you think that the answer you chose is better than the others. (If you think some of the other answers are also partially right, please explain that, too.)



2. Why do people use gasoline instead of water to run their cars? Please tell as much as you can about substances and chemical processes.



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3. When the car runs for some time, the front part of the car will become hot. When you are running for a while, you also feel very hot. When the wood is burning, it makes the air around it very hot. Why can you feel the heat in these events? Are the causes of the three events similar or different? Please explain why.

4. When a person loses weight, where does the matter of the person's fat go? Please choose ONE answer that you think is best.

- a. The fat is broken down and leaves the person's body as water and gas.
- b. The fat is converted into energy.
- c. The fat is burned up providing energy for the person's body functions.
- d. The fat is broken down and leaves the person's body as feces and urine.

Please explain why you think that the answer you chose is better than the others. (If you think some of the other answers are also partially right, please explain that, too.)

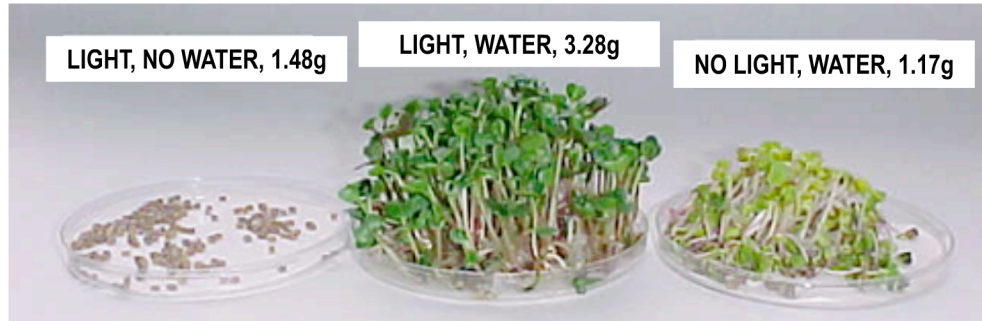
5. How are the three things related to each other:

- a person plugs in an air conditioner in the US
- trees grow in the Amazon forest
- ice in the Arctic Ocean melts

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6. Three batches of radish seeds, each with a starting weight of 1.5g (dry) were placed in Petri dishes and provided only with light or water or both, as shown in the photo. After 1 week, the material in each dish was dried and weighed. The results (masses after drying) are shown below.



a) Which of the following processes contributed the most to the increased dry mass of the “Light, Water” treatment?

- a) Absorption of mineral substances by the roots.
- b) Absorption of organic substances by the roots.
- c) Absorption of carbon dioxide gas from the air by green leaves.
- d) Absorption of water by roots.
- e) Absorption of sunlight by leaves.

b) Explain why you think your choice contributed the most to the increase in mass. (If other processes also contributed to the mass, explain which ones they are, too.)

c) The “No Light, Water” treatment lost mass (from 1.50g to 1.17g). What do you think happened to the mass that was lost?

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7. A remote island in Lake Superior is uninhabited by humans. The primary mammal populations are white-tailed deer and wolves. The island is left undisturbed for many years. Select the best answer(s) below for what will happen to the average populations of the animals over time. Please choose the ONE answer that you think is best.

- a. The deer will all die or be killed.
 - b. The wolves will all die or be killed.
 - c. On average, there will be a few more deer than wolves.
 - d. On average, there will be a few more wolves than deer.
 - e. On average, there will be many more deer than wolves.
 - f. On average, there will be many more wolves than deer.
 - g. On average, the populations of each would be about equal.
 - h. None of the above. My answer would be: _____
- _____
- _____

Please explain why you think that the answer you chose is the best. (If you think some of the other answers are also partially correct, please explain that, too.)

8. Which of the following is/are energy source(s) for plants? Circle yes or no for each of the following.

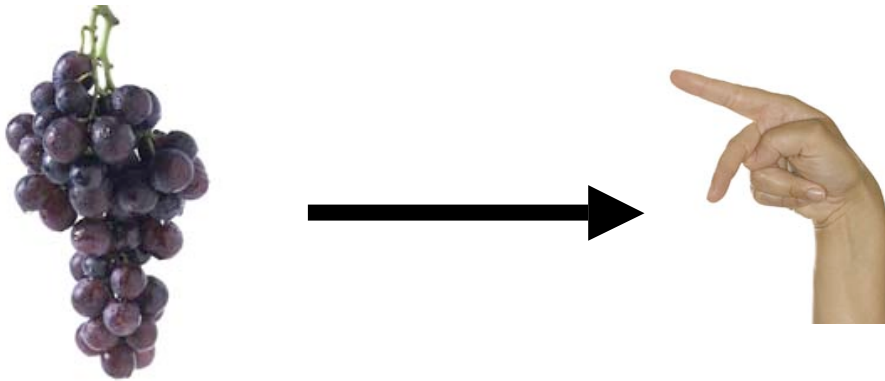
- | | |
|----------------------------------|----------|
| a. Water | Yes / No |
| b. Light | Yes / No |
| c. Air | Yes / No |
| d. Nutrients in soil | Yes / No |
| e. Plants make their own energy. | Yes / No |

Please explain ALL your answers, including why the things you circled "No" for are NOT sources of energy for plants.

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9. You eat a grape high in glucose content.



a) Please describe how one glucose molecule from the grape provides energy to move your little finger. Tell as much as you can about any biological and chemical processes involved in this event.

b) Do you think the **SAME** glucose molecule can also help you maintain your body temperature, when it is used to provide energy to move your finger? Please explain your answer.

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10. Carbon exists in different molecules or substances in nature. Please explain where carbon might exist in a forest. Complete the table below.

Question:	YES or NO	If YES, what substances or materials in these locations contain the carbon?
Do you think you would find carbon in trees?		
Do you think you would find carbon in the soil?		
Do you think you would find carbon in animals, like deer and wolves?		
Do you think you would find carbon in bacteria in the soil?		
Do you think you would find carbon in the air?		
Where else might you find carbon?		

11. People need energy to live and grow. Which of the following is/are energy source(s) for people? Circle yes or no for each of the following and explain your answers.

- | | |
|--------------|----------|
| a. Water | Yes / No |
| b. Food | Yes / No |
| c. Nutrients | Yes / No |
| d. Exercise | Yes / No |
| e. Sunlight | Yes / No |

Please explain ALL your answers, including how each material you circled "Yes" for supplies energy for people?

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12. A tree falls in the forest. After many years, the tree will appear as a long, soft lump barely distinguishable from the surrounding forest floor.



a. The mass of the lump on the floor is less than the mass of the original tree. Where do you think that the mass that is no longer in the lump has gone? In what form?

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b. What caused the changes in the wood? How did those changes happen? Give as many details as you can about what is breaking the wood down, and how this happens.

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c. Do you think that the process of decay involves energy? How?

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