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Ecology Pre-Test (High School)

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. Years ago farmers found that corn plants grew better if decaying fish were buried near by. What did the decaying fish probably supply to the plants to improve their growth? Circle ALL correct answers.

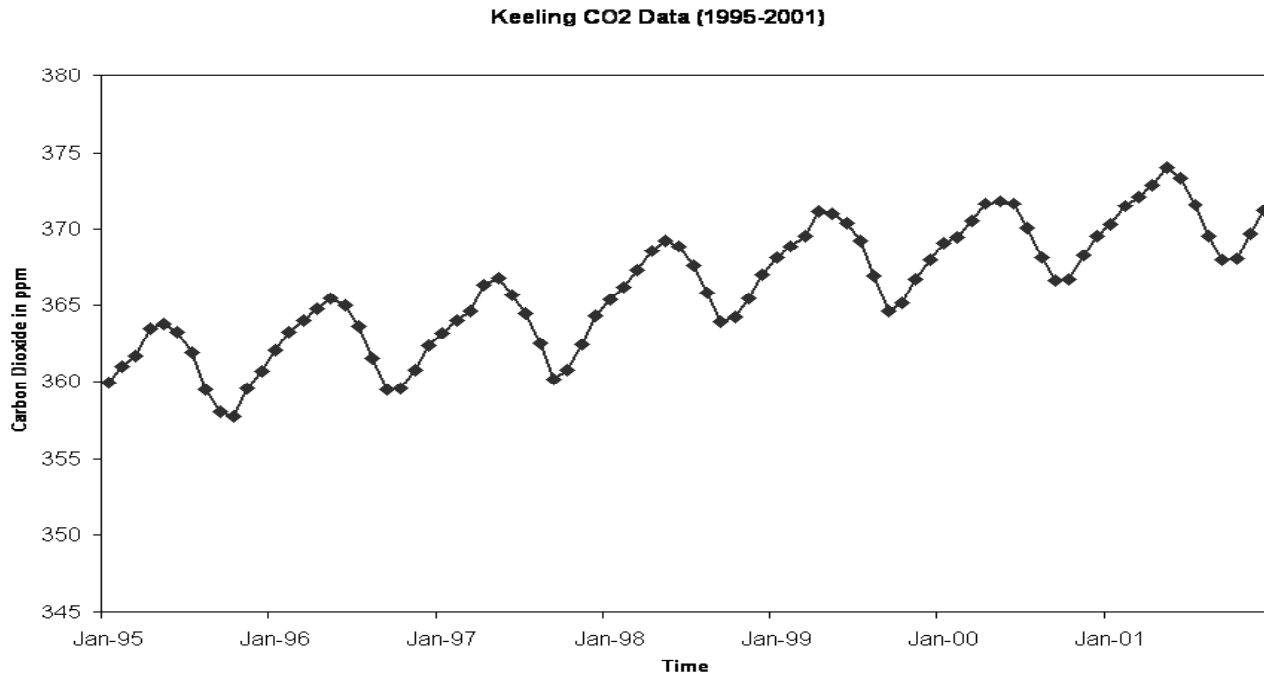
- A. energy
- B. minerals
- C. protein
- D. oxygen
- E. water

2. Explain your answer to question 1. How did the things you circled get from the fish to the plant?

3. On March 10, 2004, National Public Radio reported that “forests in a remote part of the Amazon are suddenly growing like teenagers in a growth spurt.” Though, the radio report added, “This shouldn't be happening in old, mature forests.” Scientists have speculated that our actions may have caused this phenomenon. What do you think could be the scientific basis behind such a speculation?

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4. The graph given below shows changes in concentration of carbon dioxide in atmosphere over a 5-year span at Mauna Loa observatory at Hawaii.



Why do you think this graph shows decreasing levels of carbon dioxide from early summer to fall and increasing levels of carbon dioxide from early winter to late spring?

5. Carbon exists as a part of different molecules or substances in nature. Name several places where carbon can be found in an ecosystem, and describe which molecule or substance that carbon is part of in each place.

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6. A small acorn grows into a large oak tree.

(a) Circle the substance that you think are FOOD for plants (circle ALL correct answers)?

- Soil Air Sunlight Fertilizer Water
Minerals in soil glucose

(b) Where do you think its increase in weight as it grows comes from?

(c) Explain your answer to the previous question.

7. When a person loses weight, what happens to the mass of the fat?

- A. The mass leaves the person's body as water and carbon dioxide
- B. The mass is converted into energy
- C. The mass is used up providing energy for the person's body functions
- D. The mass leaves the person's body as feces

8. Explain your answer to the previous question. Why do you think this happens to the fat?

9. When an apple is left outside for a long time, it rots.

(a) What causes the apple to rot?

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(b) Explain what happens to the weight of an apple as it rots.

10. Humans get oxygen from the air they breathe.

a. Where in the body does the oxygen get used?

b. How does the oxygen get used?

11. When humans breathe, they exhale carbon dioxide. How is the carbon dioxide produced in the body?

12. Humans must eat and breathe in order to live and grow. Are eating and breathing related to each other?
(circle one)

YES NO

13. Explain why you circled your answer for the previous question.

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14. Which gas(es) do plants take in from their environments? (you may circle more than one)

oxygen carbon dioxide other

15. Explain what happens to the gases once they are inside the plant.

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16. What do you think are the main causes of global warming? List them in order of significance.

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17. Explain your choice of order on the previous question, explaining how you decided which causes were more significant than other causes.

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18. The BEST way to reduce global warming would be:

- (a) to reduce air pollution from factories and power plants.
- (b) To plant more forests and grow more trees.
- (c) To use public transportation rather than personal cars.
- (d) Any other (mention): _____

19. Why do you think your choice on the previous question is the BEST way to reduce global warming?

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20. A small car on average uses 400 gallons of gasoline a year. About how many pounds of carbon dioxide do you think the car emits from burning the 400 gallons of gasoline?

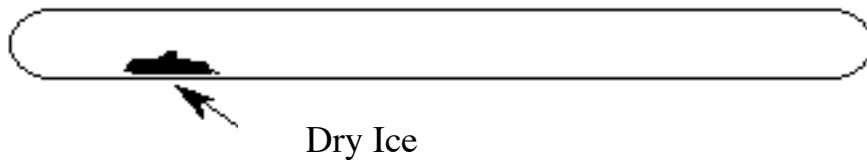
- (a) close to 0 lbs of carbon dioxide as gases weigh almost nothing.
- (b) close to 80 lbs of carbon dioxide
- (c) close to 800 lbs of carbon dioxide
- (d) close to 8000 lbs of carbon dioxide
- (e) close to 80,000 lbs of carbon dioxide

21. About how many trees would you have to grow to absorb the amount of carbon dioxide emitted per year by the small car mentioned in the previous example?

- (a) about 2000
- (b) about 200
- (c) about 20
- (d) about 2

22. What happens to the wood of a match as the match burns? Why does the match lose weight as it burns?

23. A sample of solid carbon dioxide (dry ice) is placed in a tube and the tube is sealed after all of the air is removed. The tube and the solid carbon dioxide together weigh 27 grams.



The tube is then heated until all of the dry ice evaporates and the tube is filled with carbon dioxide gas. The weight after heating will be:

- (a) less than 26 grams.
- (b) 26 grams.
- (c) between 26 and 27 grams.
- (d) 27 grams.
- (e) more than 27 grams.

24. Explain the reason for your answer to the previous question?

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25. Do you think that wood is a mixture of different substances? (Circle one)

YES NO

Please explain your ideas about what makes up wood.

26. Do you think that a muscle cell is a mixture of different materials? (Circle one)

YES NO

Please explain your ideas about what makes up a muscle cell.

27. When you open a bottle of soda, the soda starts to fizz. Does anything happen to the weight of the soda?
(Circle One)

YES NO

28. Explain your answer to the previous question.

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