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Topic: Carbon in the Biosphere Worksheet

Summary: Students will fill out the worksheet based on cellular energy including photosynthesis and cellular respiration.

Goals & Objectives: Students will be able to explain how energy is transferred in nature and the equations of photosynthesis and cellular respiration.

Time Length: 20 minutes

NGSS Standards:
HS-LS1-5: Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
HS-LS1-7: Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.

Materials:
Class notes or textbook or online textbook

- https://flexbooks.ck12.org/cbook/ck-12-biology-flexbook-2.0/section/2.17/primary/lesson/autotrophs-and-heterotrophs-bio/
- https://flexbooks.ck12.org/cbook/ck-12-biology-flexbook-2.0/section/2.30/primary/lesson/anaerobic-and-aerobic-respiration-bio/

Procedures:
Hand out this worksheet as a review of bioenergetics (cellular energy). Many questions repeat the same concepts but ask the question in a different way.

Accommodations:
Students with an IEP may work with a partner filling in the definitions.

Editable DOCX File and Answer Key:
Available at www.ngsslifescience.com

Name: _____ Row: _____

Date:_____ Period:_____

Carbon in the Biosphere WS

(Write definitions or explanations)

1. Autotrophs get energy from _____
2. Heterotrophs get energy from _____
3. Are animals considered an autotroph or a heterotroph? _____
4. Are plants considered an autotroph or a heterotroph? _____
5. What does ATP do for the cell? _____
6. Does ADP have stored chemical energy usable for the cell? _____
7. What is different between ATP and ADP

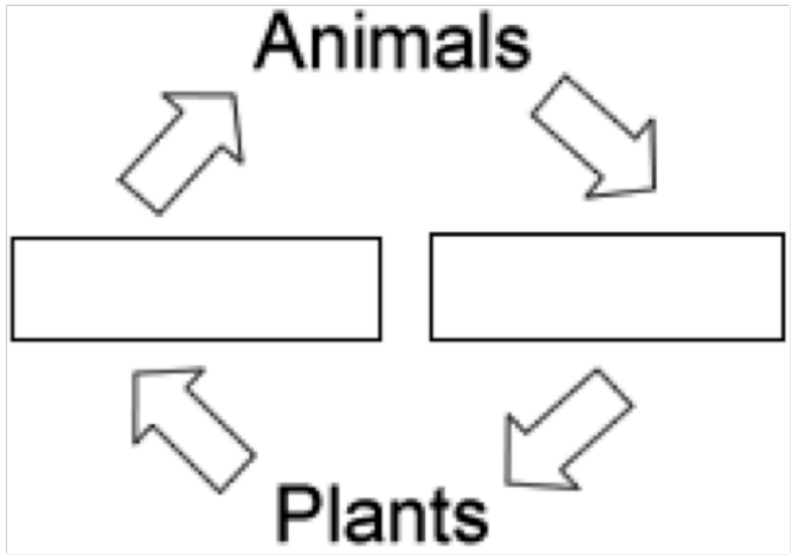
_____

8. Energy releasing equation: __ATP__ → _____ + _____ + ___Released Energy___
9. What organelle performs photosynthesis? _____
10. What process converts light energy into chemical energy? _____
11. Photosynthesis Equation: _____ + _____ + Light → _____ + _____
12. What does photosynthesis release into the air? _____
13. What are the reactants of photosynthesis? _____
14. What are the products of cellular respiration? _____
15. What organelle performs cellular respiration? _____
16. What process releases the chemical energy stored in food? _____
17. Cellular Respiration Equation: _____ + _____ → _____ + _____ + _____
18. What does cellular respiration release into the air? _____
19. What are the reactants of cellular respiration? _____
20. What are the products of photosynthesis? _____
21. How are photosynthesis and cellular respiration related? _____

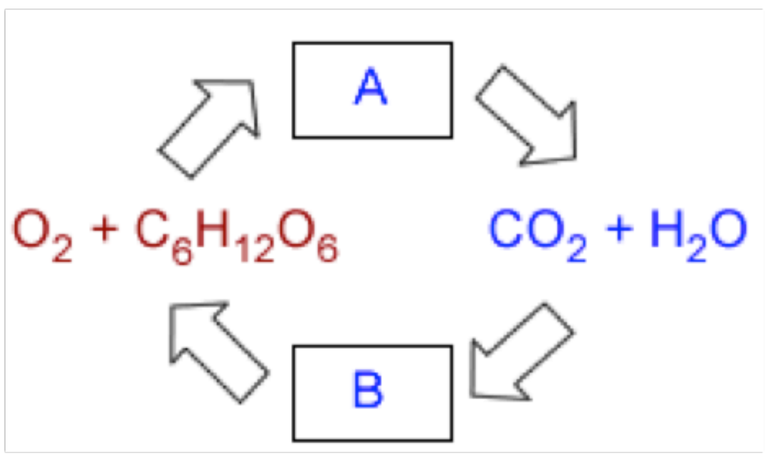
_____

22. What organelle is used in cellular respiration if oxygen is present? _____
23. This is called _____ respiration. (meaning with oxygen)
24. What happens if oxygen is not present? _____
25. When would a cell produce the most ATP, with or with out oxygen? _____
26. Why do plants have mitochondrion? _____

27. Fill in the cycle below using the reactants for both cellular respiration and photosynthesis.



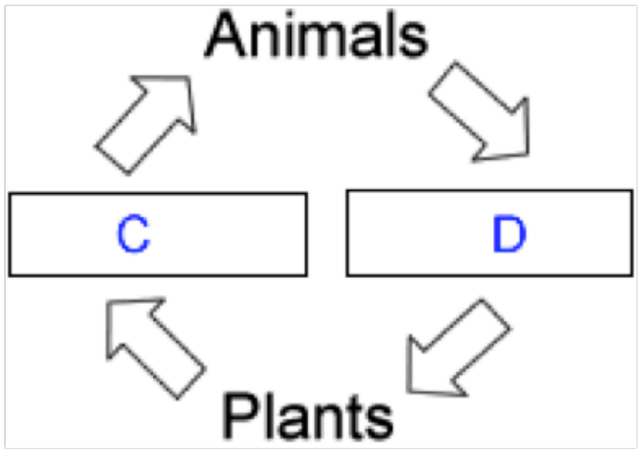
28. What is the process in box A and in box B?



A) _____

B) _____

29. What are the *molecules* created in step C and step D?



C) _____

D) _____

30. Compare and contrast photosynthesis and cellular respiration using the Venn diagram below.