Section 1: Chemical Energy and ATP

Key Concept

All cells need chemical energy.

Main Idea: The chemical energy used for most cell processes is carried   
by ATP.

Circle the word or phrase that best completes the statement.

1. All cells use adenosine triphosphate (ATP) for energy. ATP is a molecule / organelle that transfers energy from the breakdown of ADP / food molecules to cell processes.

2. ATP is a high-energy / low-energy molecule that is converted into   
higher-energy / lower-energy ADP when a phosphate group is removed   
and energy is released.

3. ADP is converted back into ATP by the addition of a phosphate group /   
food molecule.

Main idea: Organisms break down carbon-based molecules to produce ATP.

4. molecules least likely to be broken down \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. molecules most commonly broken down \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. molecules that store most of the energy in a person’s body \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. triglyceride yields about 146 ATP \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. glucose yields about 36 ATP \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. store about the same amount of energy as carbohydrates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Key Concept**

The overall process of photosynthesis produces sugars that store chemical energy.

**Main Idea:** Photosynthetic organisms are producers.

**Circle the word or phrase that best completes the statement.**

10. Some organisms are called producers because they produce the source of *chemical energy / light energy* for themselves and for other organisms.

11. Photosynthesis captures *chemical energy / light energy* to make sugars that store *chemical energy / light energy*.

12. Chlorophyll is a molecule in chloroplasts that absorbs some of the energy in *visible light / ultraviolet light.*

**Main Idea:** Photosynthesis in plants occurs in chloroplasts.

13. Chloroplasts are membrane-bound organelles where \_\_\_\_\_\_\_\_\_ takes place   
in plants.

14. Photosynthesis takes place in two parts of a chloroplast: the \_\_\_\_\_\_\_\_\_   
and the \_\_\_\_\_\_\_\_\_.

15. Thylakoids are coin-shaped, membrane-enclosed compartments   
inside the \_\_\_\_\_\_\_\_\_.

16. The overall process of photosynthesis can be written as a chemical equation. Fill in the blanks in the equation below using the appropriate compound from the box.

|  |  |  |  |
| --- | --- | --- | --- |
| 6O2 | 6CO2 | 6H2O | C6H12O6 |

\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_

17. The two reactants in the photosynthesis equation are \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_.

18. The two products in the photosynthesis equation are \_\_\_\_\_\_\_\_\_ and   
\_\_\_\_\_\_\_\_\_.

19. Why is the photosynthesis equation often written with several arrows?

a. Because many enzymes are added to the reactants to make the products.

b. Because many chemical reactions occur with the help of many enzymes.

c Because many reactants can enter into the photosynthesis reaction.

d. Because many products can be made from the photosynthesis reaction.

**Circle the word or phrase that best completes the statement.**

20. The light-dependent reactions require *light / do not require light,* and they absorb and transfer sugars / energy.

21. The light-independent reactions require light / do not require light, and they build sugars / energy.

**Fill in each blank with the word or phrase that best completes the sentence.**

22. The prefix *photo-* means “light,” and synthesis means “to put together.”  
During photosynthesis, \_\_\_\_\_\_\_\_\_\_ from light is used to put together \_\_\_\_\_\_\_\_\_.

23. The prefix *chloro-* means “green,” and the suffix *-phyll* means “leaf.” Therefore, chlorophyll is the light-absorbing molecule that makes leaves   
look \_\_\_\_\_\_\_\_\_.

24. The prefix *in-* means “not.” Therefore, the reactions in photosynthesis that do not require light are called light-\_\_\_\_\_\_\_\_\_.

**Key Concept**

The overall process of cellular respiration converts sugar into ATP using oxygen.

**Main Idea**: Cellular respiration makes ATP by breaking down sugars.

**Circle the word or phrase that best completes the statement.**

25. Cellular respiration is a process that releases *glucose / energy* from sugars   
and other carbon-based molecules to make ATP when *oxygen / carbon dioxide* is present.

26. Cellular respiration is called an aerobic process, because it needs *oxygen / carbon dioxide* to take place.

27. Cellular respiration takes place in the *chloroplasts / mitochondria*.

28. During glycolysis, one molecule of *glucose / protein* is split into two three-carbon molecules and two *ADP / ATP* are formed