

Name \_\_\_\_\_ Hour \_\_\_\_\_

## Unit 2 Summative Assessment Study Guide for Macromolecules, Photosynthesis and Cellular Respiration

**NGSS.HS.LS1-6.3** I can identify and describe the 4 essential macromolecules of life.

Complete the following chart:

<u>Macromolecule</u>	<u>Building Block</u>	<u>Function</u>	<u>Example from the human body</u>
Carbohydrate	Glucose	Primary Source of energy (short term)	glycogen - (glucose) (ribose)
Lipid	glycerol & Fatty Acid	Store energy - more long term	Hormones, Cell membrane Wax, Body Fat
Nucleic Acid	Nucleotide	Stores genetic info to make protein	DNA, RNA, ATP
Protein	Amino Acid	Build structure of Body	Muscle, Bone, enzymes, Hair

**NGSS.HS.LS1-5.1** I can use a model to illustrate the inputs and outputs of matter in photosynthesis.

**NGSS.HS.LS1-5.2** I can use a model to illustrate the transfer of energy in photosynthesis.

- Photosynthesis is: process that plants use to convert sunlight into stored chemical energy (glucose)
- Write the formulas for photosynthesis: below:
  - word: Carbon dioxide + Water  $\xrightarrow{\text{sunlight (energy)}}$  glucose + O<sub>2</sub>
  - chemical:  $6\text{CO}_2 + 6\text{H}_2\text{O} \xrightarrow{\text{sunlight}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
- In what organelle does photosynthesis take place? Chloroplast
- Explain why chloroplasts are important: chloroplasts are the right place where photosynthesis takes place
- Energy that is captured during photosynthesis is stored as what? glucose
- Write the reactants and products of photosynthesis:
  - reactants: Carbon dioxide & Water
  - products: glucose & O<sub>2</sub>

NGSS.HS.LS1-7.1 I can use a model to illustrate the inputs and outputs of matter in cellular respiration.  
 NGSS.HS.LS1-7.2 I can use a model to illustrate the transfer of energy in cellular respiration.

7. Cellular respiration is: Process that plants & animals use to convert stored energy (glucose or glycogen) into ATP

8. Write the formulas for cellular respiration below:

a. word: glucose + oxygen → carbon dioxide + water + ATP

b. chemical:  $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + ATP$

9. In what organelle does cellular respiration take place? mitochondria

10. Explain why ~~chloroplasts~~ <sup>mitochondria</sup> are important: Mitochondria are the sight (place) where cellular respiration takes place (Krebs cycle, ETC)

11. What form of energy is ~~broken down~~ <sup>the result of</sup> during cellular respiration? TO MAKE ATP

12. Write the reactants and products of cellular respiration:

a. reactants: glucose + Oxygen

b. products: Carbon Dioxide + H<sub>2</sub>O + ATP

NGSS.HS.LS1-7.3 I can describe the role of ATP in energy storage.

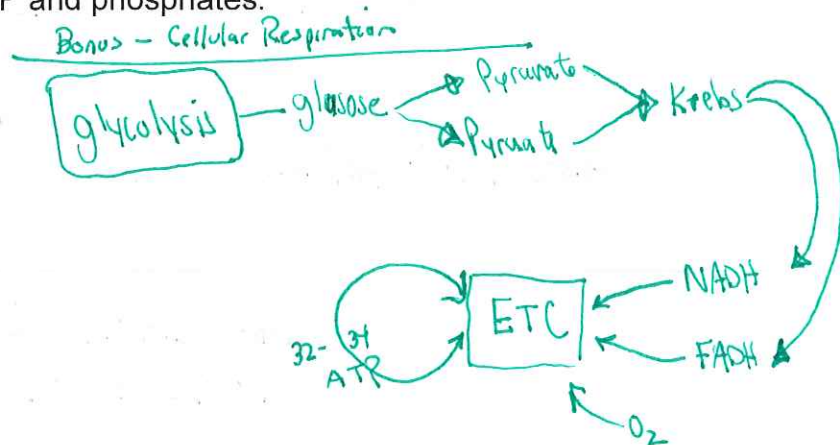
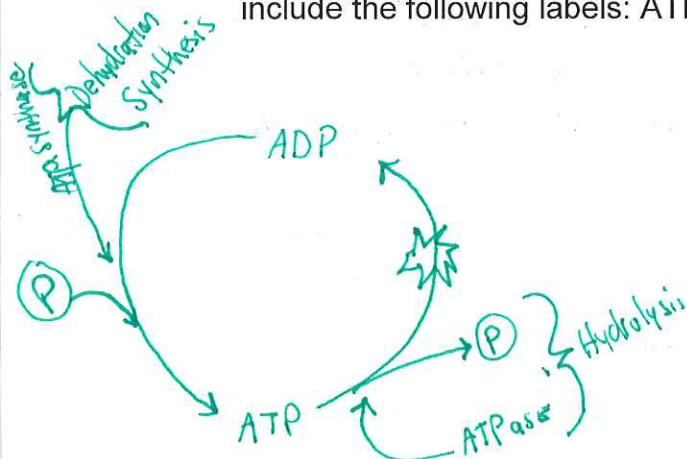
13. Glycolysis is: the process that breaks glucose into pyruvate

14. What does most of the energy from ~~cellular respiration~~ <sup>glucose in</sup> become? ATP

15. Aerobic is: Process that uses (requires) oxygen to work

16. Anerobic is: process that does not require oxygen to work

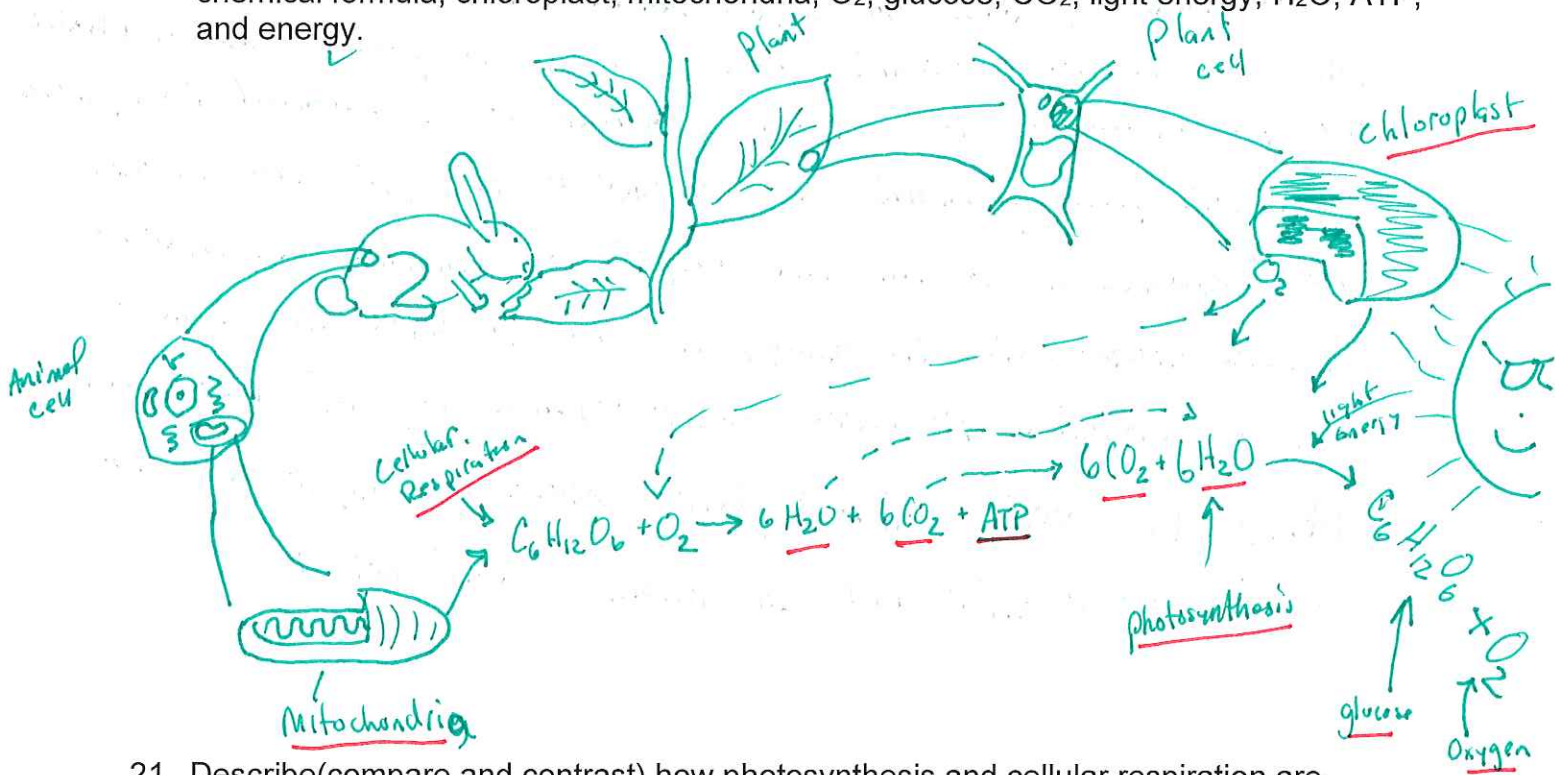
17. Create a diagram that shows the flow of energy during cellular respiration. Describe how energy molecules are transferred and describe the results obtained. Be sure to include the following labels: ATP, ADP and phosphates.



18. An autotroph is: An organism that "make" its own food converting sunlight to glucose

19. A heterotroph is: An organism that consumes other organisms to get "energy" for its own metabolic requirements

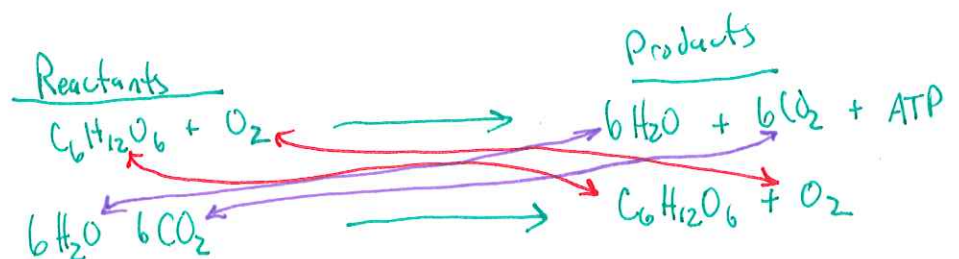
20. Create a diagram that shows the processes of photosynthesis and cellular respiration. Be sure to include the following: photosynthesis chemical formula, cellular respiration chemical formula, chloroplast, mitochondria, O<sub>2</sub>, glucose, CO<sub>2</sub>, light energy, H<sub>2</sub>O, ATP, and energy.



21. Describe (compare and contrast) how photosynthesis and cellular respiration are related. Be sure to include:

- how molecules are recycled;
- how energy is cycled;
- where each process is located;
- the use of chemical formulas to indicate the reactants and products of each process; and
- how photosynthesis and cellular respiration relate back to the 7 themes of biology. *NEXT PAGE*

During ? : CR : the products from Photosynthesis are used in Cellular respiration and the products of (CR.) are used in photosynthesis  
 photosynthesis occurs in plants (Autotrophs) - in the chloroplasts using chlorophyll  
 cellular respiration occurs in plants & Animals - mainly in the mitochondria



Things you should include:

The seven themes of life: All require energy in one way or another  
The Sun is the ultimate source of energy for planet EARTH. Plants  
use photosynthesis to convert sunlight to a chemical form (glucose)  
which both plants & animals can convert to ATP. ATP can be used  
for reproduction - to help make offspring or maintain an internal  
balance - homeostasis. The energy is used to drive all chemical  
reactions - metabolism. No matter what organisms do they need Energy  
(ATP) to survive, without plants converting sunlight most life  
would cease to exist and all themes would not occur