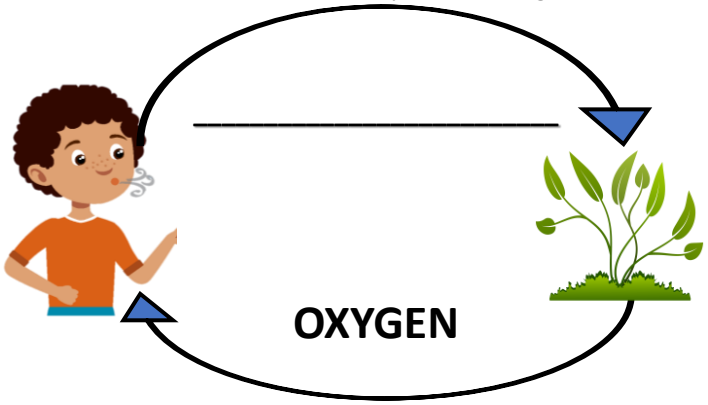
Photosynthesis & Respiration VIDEO GUIDE

Name_____

Instructions: Use the video, **Photosynthesis and Respiration** from www.crsci.org for moving through this guide! You may pause, rewind however many times that you wish. Be sure to fill in all blanks and answer all questions!

1) Fill in the blank below to complete the diagram



2) **True or False. If False, explain why.**
The goal of Photosynthesis & Respiration is to put out Oxygen and Carbon Dioxide

_____
_____
_____
_____

NOTES

- **PHOTO** means _____ and **SYNTHESIS** means _____ and the TRUE GOAL of Photosynthesis is _____!

- During Photosynthesis the _____ energy in _____ and _____, then use _____ energy to _____ it into _____ and _____ gas

NOTES

- **A CHEMICAL REACTION is the _____ of _____**
- **Chemical EQUATIONS _____ represent what happened during the reaction**

REACTANTS ⟶ ***PRODUCTS***

- **REACTANTS** are the substances you_____with

- **PRODUCTS** are the substances you_____with

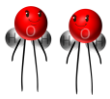
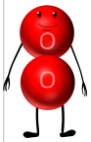
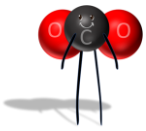
REACTANTS ⟶ ***PRODUCTS***

3) What would the REACTANTS be in a cup of coffee shown above?

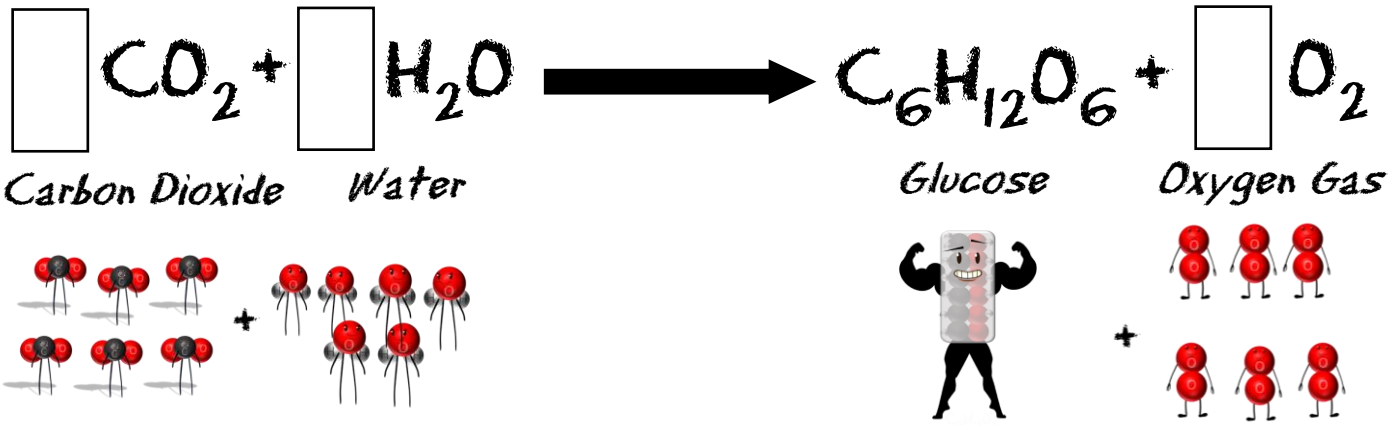
$$H_2CO_3 \longrightarrow CO_2 + H_2O$$

4) Jamie says "more matter is present in the products of the equation above."
Do you agree or disagree? Explain

PHOTOSYNTHESIS

STAGE?	WHERE?	INPUT(s)	OUTPUT(s)
_____ **REACTIONS** _____ is captured by _____ and is used to _____ water	CHLOROPLASTS (thylakoid membrane) 	LIGHT &  _____	 NADPH (electron carriers) &  _____GAS
_____ **REACTIONS** (CALVIN CYCLE) _____is taken in and **rearranged** into _____	CHLOROPLASTS (stroma) 	_____ 	_____ 

4) Fill in the boxes BELOW with the appropriate number (coefficient) to complete the Photosynthesis equation.



a. What are the **REACTANTS** of Photosynthesis?

b. What are the **PRODUCTS** of Photosynthesis?

5) Travon and Luis are conducting an experiment on factors that affect oxygen & glucose production of plants. They conclude their experiment and find that glucose levels are unchanged yet oxygen levels are severely low. **Which stage of Photosynthesis has been affected and why?**

_____

_____

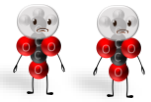
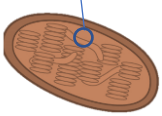
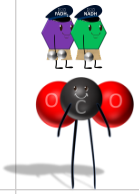
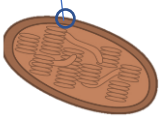
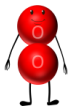
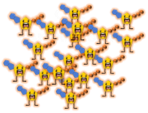
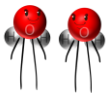
_____

_____

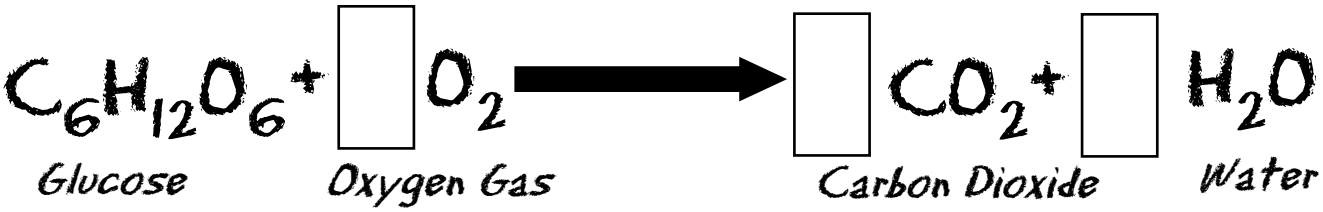
_____

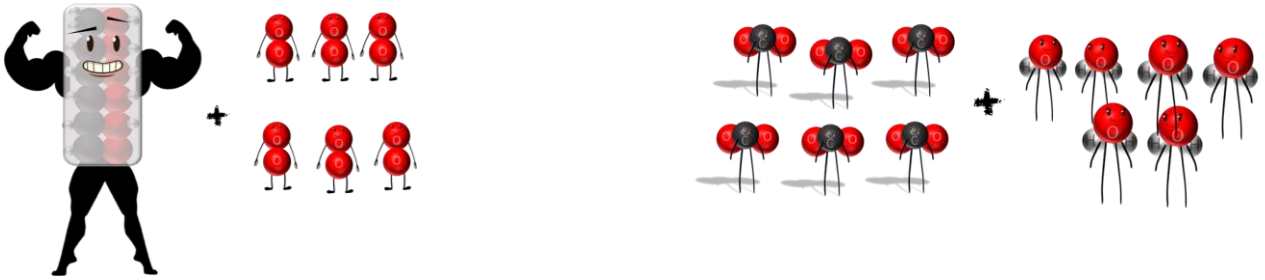
_____

CELL RESPIRATION

STAGE?	WHERE?	INPUT(s)	OUTPUT(s)
GLYCOLYSIS Glucose is rearranged into a useable form	CYTOPLASM	_____ 	 Useable form (2 Pyruvates)  ATP
KREBS CYCLE (Citric Acid Cycle) Useable form is broken down to make electron carriers	MITOCHONDRIA (MATRIX) 	_____	 Electron Carriers *($FADH_2$ & NADH)* Carbon Dioxide
ELECTRON TRANSPORT CHAIN Electron carriers cause create a Hydrogen (proton) gradient to generate ATP and water	MITOCHONDRIA (MEMBRANE) 	 Electron Carriers *($FADH_2$ and NADH)*  Oxygen Gas	 Large amount of ATP  Water

6) Fill in the boxes BELOW with the appropriate number (coefficient) to complete the Photosynthesis equation.





a) What are the **REACTANTS** of Cell Respiration?

b. What are the **PRODUCTS** of Cell Respiration?

7) Mariana uses a special detergent that dissolves the membrane of mitochondria.
Which statement below describes a data trend that she would NOT observe at the end ?

a. A decrease in levels of pyruvate
b. A decrease in levels of water
c. A decrease in levels of Carbon Dioxide
d. None of these data trends would be observed

8) **True or False, if false explain why.**
Photosynthesis and Cell Respiration work as a CYCLE, because the products of photosynthesis are the same as the products of cell respiration.

_____
_____
_____
_____
_____

9) **FERMENTATION** is a process where ATP and energy is made WITHOUT the presence of OXYGEN. **However, why can this process be detrimental for living things?**

_____
_____
_____
_____
_____

10) **Which explanation accurately describes how matter is transformed within the process of photosynthesis?**

A. In the light reactions, carbohydrates release hydrogen atoms and form carbon dioxide. The hydrogen atoms join with oxygen to form water molecules in the Calvin cycle.

B. In the Calvin cycle, carbohydrates release hydrogen atoms and form carbon dioxide. The hydrogen atoms join with oxygen to form water molecules in the light reactions.

C. The hydrogen and oxygen atoms of water are split in the light reactions, and oxygen is released. In the Calvin cycle, hydrogen atoms join with the carbon and oxygen atoms of carbon dioxide to form carbohydrates.

D. The hydrogen and oxygen atoms of water are split in the Calvin cycle, and oxygen is released. In the light reactions, hydrogen atoms join with the carbon and oxygen atoms of carbon dioxide to form carbohydrates.

#11-20, MATCH one of the choices on the right to the statements on the left.

11) _____ Organelle where Glucose is synthesized

12) _____ Provides the energy for Photosynthesis to begin

13) _____ Accepts the final electrons & Hydrogen to form water at the end of respiration

14) _____ Enters the chloroplasts, usually at night

15) _____ Is rearranged in the cytoplasm to begin respiration

16) _____ Transports particles to spark the movement of Hydrogen across the membrane

17) _____ Formed by the movement of Hydrogen through an enzyme

18) _____ Organelle where Cell Respiration takes place

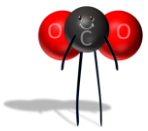
19) _____ Molecule that is split during the LIGHT REACTIONS

20) _____ Useable form that is rearranged from glucose during Glycolysis

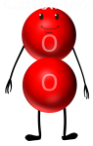
a. Chloroplast

b. Sunlight

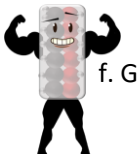
c. Water (H_2O)



d. Carbon Dioxide (CO_2)

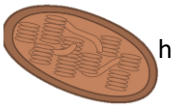


e. Oxygen Gas (O_2)



f. Glucose ($C_6H_{12}O_6$)

g. Electron Carriers
(NADPH/$FADH_2$/NADH)



h. Mitochondria

i. ATP

j. Pyruvate