Name _____ Date _____ Period _____

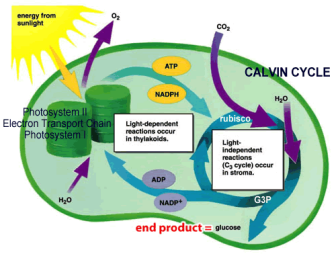
Photosynthesis Review KEY

In the space provided, write the letter of the description that best matches each term.

A.	**Metabolism**
B.	**Photosynthesis**
C.	**Thylakoid**
D.	**Autotroph**
E.	**Oxygen**

1. __ **D**____ Organisms that use sunlight to make their own food.
2. ___**B**___ The process by which plants, algae, and some bacteria use energy from sunlight to combine carbon dioxide and water, producing glucose and oxygen.
3. ___**A**___ A term used to describe the many reactions taking place inside of cells, including the building or breaking down of molecules.
4. ___**C**___ The structure within the chloroplast that contains the pigment chlorophyll and traps light energy.
5. ___**E**___ The gas <u>byproduct</u> of photosynthesis, which is then taken in during cellular respiration.

Determine the order in which the steps of energy flow in an ecosystem. Write the number (1-4) in the space provided.

 Animals get energy by eating autotrophs, substances produced by autotrophs, or organisms that consume autotrophs.	 Autotrophs absorb sunlight and trap the energy in the many chloroplasts found in leaves.	 Light from the sun reaches the earth.	 Inside the chloroplast, solar energy is converted into chemical energy in the form of glucose.
Step Number: ___**4**____	***Step Number:*** ___**2**____	***Step Number:*** ___**1**____	***Step Number:*** ___**3**____

Photosynthesis – BIG Picture

Answer the following questions on the overall purpose and process of photosynthesis.

6. In a single sentence, identify the **overall purpose of photosynthesis**.
   TO USE ENERGY FROM THE SUN IN ORDER TO PRODUCE FOOD (GLUCOSE) or… TO CONVERT SOLAR ENERGY TO CHEMICAL ENERGY
7. Photosynthesis takes place in which eukaryotic organelle? _____**CHLOROPLAST**_____
8. What is taken **INTO** the plant during photosynthesis (aka REACTANTS)?
   CARBON DIOXIDE, WATER, LIGHT ENERGY
9. What is let **OUT OF** the plant during photosynthesis (aka PRODUCTS) ?
   GLUCOSE AND OXYGEN
10. Write the balanced *chemical equation* for photosynthesis. **$6CO_2 + 6H_20$ + LIGHT ENERGY → $C_6H_{12}O_6 + 6O_2$**

Photosynthesis – The Details

11. What is the **major difference** between the light dependent and light independent reactions of photosynthesis?
THE LIGHT DEPENDENT REACTION IS ACTIVATED BY LIGHT ENERGY. THE LIGHT INDEPENDENT REACTION (CALVIN CYCLE) CAN RUN WITHOUT LIGHT.

12. Fill in the following chart using your photosynthesis notes. Keep in mind, terms can be used more than once.

Light Dependent INPUTs (2)	Light Dependent OUTPUTS (3)	Light Independent INPUTS (3)	Light Independent OUTPUTS (1)
LIGHT ENERGY **WATER**	**OXYGEN** **NADPH** **ATP**	**NADPH** **ATP** **CARBON DIOXIDE**	**GLUCOSE**

13. Where in the chloroplast do the **light dependent reactions** take place? _____**THYLAKOID**_____

    a. What two high energy carrying molecules are produced following the light dependent reactions and therefore kickstart (activate) the light independent reactions?
    NADPH AND ATP

14. The **light independent reactions** are also known as the _____**CALVIN**_____ _____**CYCLE**_____.

    a. Where in the chloroplast does this take place? _____**STROMA**_____

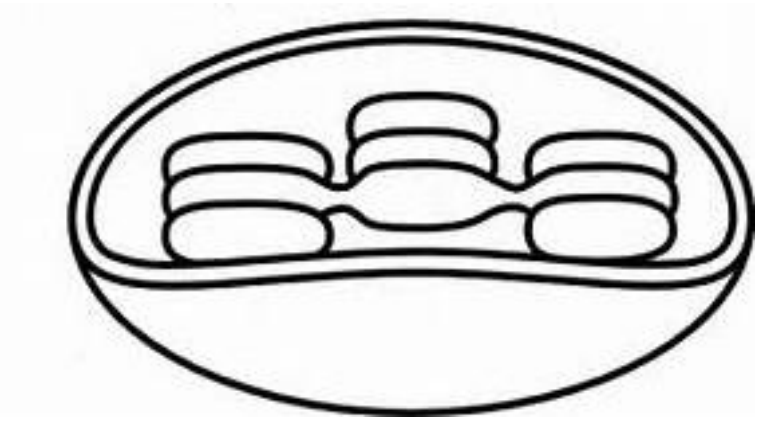
15. Leaves contain many pore-like openings, known as **stomata,** where the exchange of gas takes place.

    a. Which **gas** *enters through the stomata* during photosynthesis? ____**CARBON DIOXIDE**_____

    b. Which **gas** *leaves through the stomata* following photosynthesis? _____**OXYGEN**_____

16. Label the major parts of a chloroplast on the diagram to the right:

    Outer Membrane , Inner Membrane
    Thylakoid , Granum , Stroma
    Chlorophyll



Name _____ Date _____ Period _____

Cellular Respiration Review KEY

In the space provided, write the letter of the description that best matches each term.

1. ___C___ The energy carrying molecule produced during cellular respiration.
2. ___E___ The process which breaks down food in order to produce energy.
3. ___A___ Organisms that must consume other organisms for energy.
4. ___F__ Portion of cellular respiration that produces the *greatest amount of ATP*.
5. ___B___ Anaerobic portion of respiration that takes place in the **cytoplasm**.
6. ___D___ *Following glycolysis*, this process takes place in the absence of oxygen.

A. Heterotrophs

B. Glycolysis

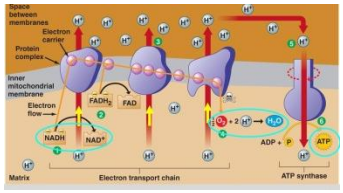
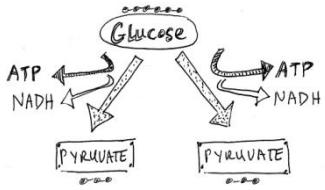
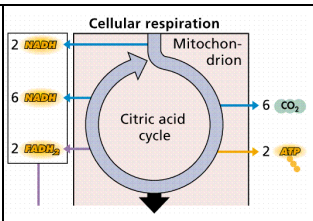
C. ATP

D. Fermentation

E. Cellular Respiration

F. Electron Transport Chain

Determine the order in which the steps of energy flow in an ecosystem. Write the number (1-4) in the space provided.

 The **electron transport chain** takes place, producing the majority of energy in cellular respiration – 34 ATP.	 **Glycolysis** takes place, where glucose is broken down into pyruvic acid, producing 2ATP.	 The **Krebs Cycle (or Citric Acid Cycle)** takes place, producing NADH and $FADH_2$ and 2ATP.	 Following photosynthesis, *Glucose is taken into the mitochondria* after it is given off from the chloroplasts.
Step Number: ___4____	***Step Number:*** ___2____	***Step Number:*** ___3____	***Step Number:*** ___1____

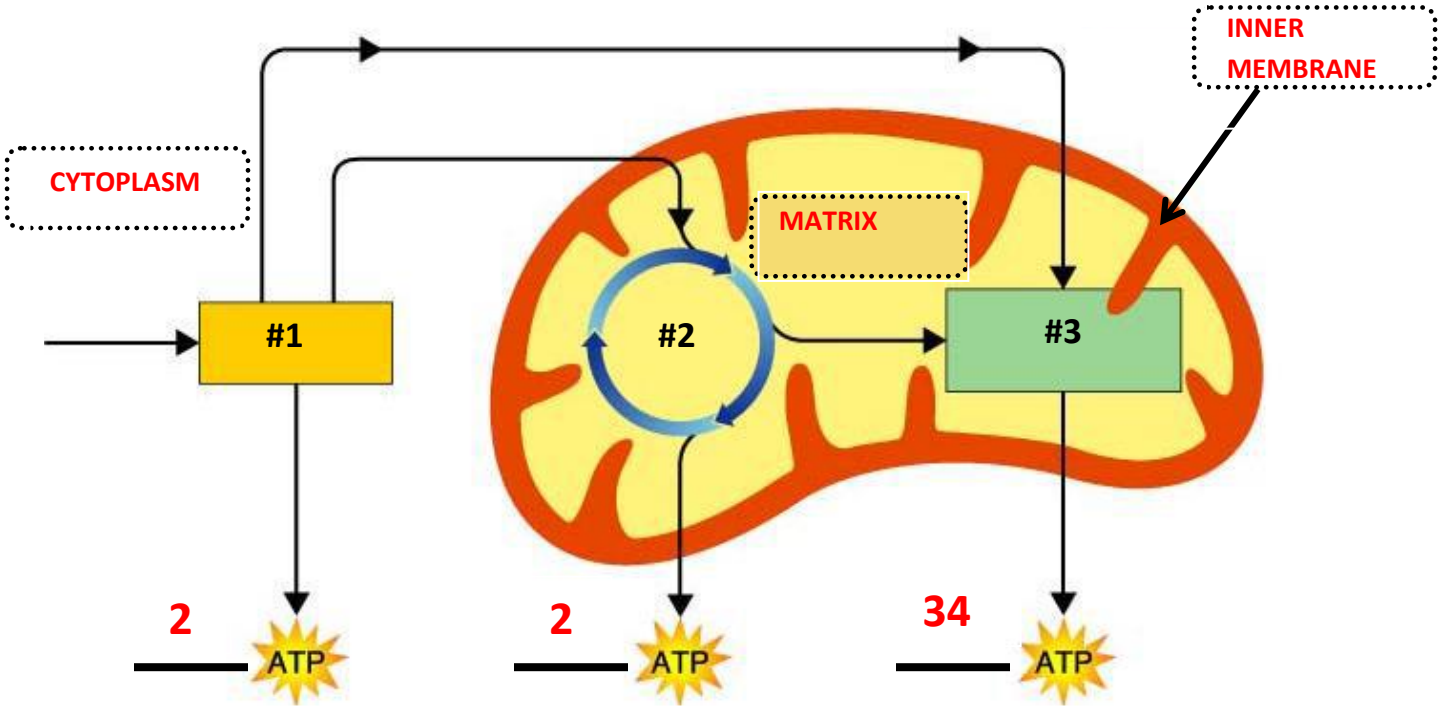
Cellular Respiration – BIG Picture

Answer the following questions on the overall purpose and process of cellular respiration.

7. In a single sentence, identify the **overall purpose of cellular respiration**.
   TO BREAK DOWN GLUCOSE IN ORDER TO PRODUCE ENERGY IN THE FORM OF ATP.
8. The majority of *aerobic cellular respiration* takes place in which organelle? ___**MITOCHONDRIA**_____
9. Generally speaking, what is taken **INTO** the mitochondria during cellular respiration (aka REACTANTS)?
   GLUCOSE AND OXYGEN
10. Generally speaking, what is let **OUT OF** the mitochondria during cellular respiration (aka PRODUCTS)?
    CARBON DIOXIDE, WATER, AND ATP
11. Write the balanced *chemical equation* for cellular respiration. **$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_20$ + ENERGY (ATP)**

Cellular Respiration – The Details

12. **True or False:** Only heterotrophs utilize cellular respiration to produce ATP. *Explain your answer*. **FALSE. BOTH AUTOTROPHS AND HETEROTROPHS UTILIZE CELL RESPIRATION.**



13. Label the following terms in the correct dotted boxes : ***Cytoplasm , Matrix , Folded Inner Membrane***

14. Properly identify the three major ***stages/phases*** of cellular respiration labeled **#1 - #3**.

#1 ____GLYCOLYSIS___ #2 ____CITRIC ACID CYCLE (KREBS CYCLE)____ #3 __ELECTRON TRANSPORT CHAIN__

15. Identify the ***number of ATP*** produced during each phase of cell respiration in the above diagram.

16. Complete the flow chart seen below with the appropriate terms: ***Aerobic, Anaerobic, Cellular respiration, Lactic Acid or Alcohol Fermentation, Glycolysis.***

GLYCOLYSIS

takes place in the **cytoplasm**

If oxygen is *present*....

CELLULAR RESPIRATION

takes place, meaning this process is

AEROBIC

If oxygen is *unavailable*....

FERMENTATION

takes place, meaning this process is

ANAEROBIC