Name: _____ Date: _____ Hour: _____

Biology Final Exam Review

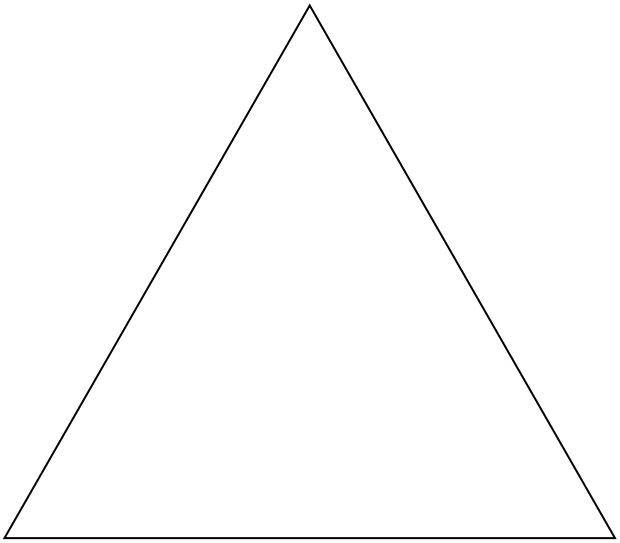
Date of Exam: _____ Review Due Date: _____

Cell Energy and Nutrient Cycles

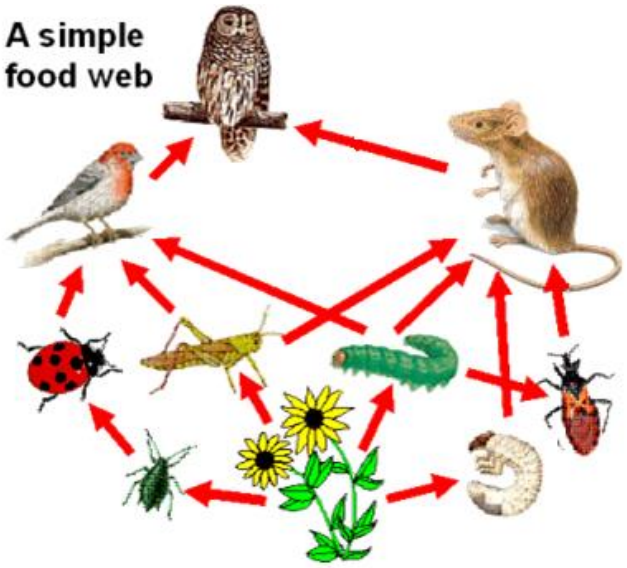
1. Describe the difference between an autotroph and a heterotroph.

2. Describe what happens to the amount of energy transferred between trophic levels as you go up an energy pyramid. Hint: 10% rule!

3. Using the triangle to the right, fill in the following:
   a) Tertiary consumer
   b) Herbivore
   c) Autotroph
   d) Primary Consumer
   e) Secondary Consumer
   f) Producer
   g) Decomposer



4. Use the following food web to answer the questions:



Autotrophs	Heterotrophs

Herbivore	Carnivore	Omnivore

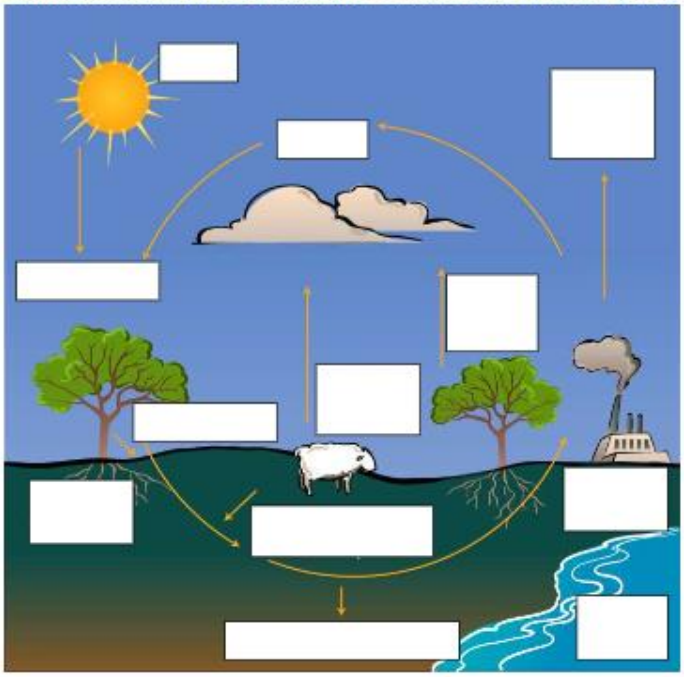
Producers	Primary Consumers	Secondary Consumers	Tertiary Consumers	Quaternary Consumer	Decomposers

5. Create an energy pyramid for the above food web.

6. Answer the following questions about the carbon cycle.
   a) Plants use CO_2 in the process of _____ to make _____ and oxygen.
   b) Animals use oxygen in the process of _____ and make more CO_2.
   c) Deposits are burned as fossil fuels, which include _____, _____, and _____.
   d) Fill in the diagram of the Carbon Cycle.

Carbon Cycle

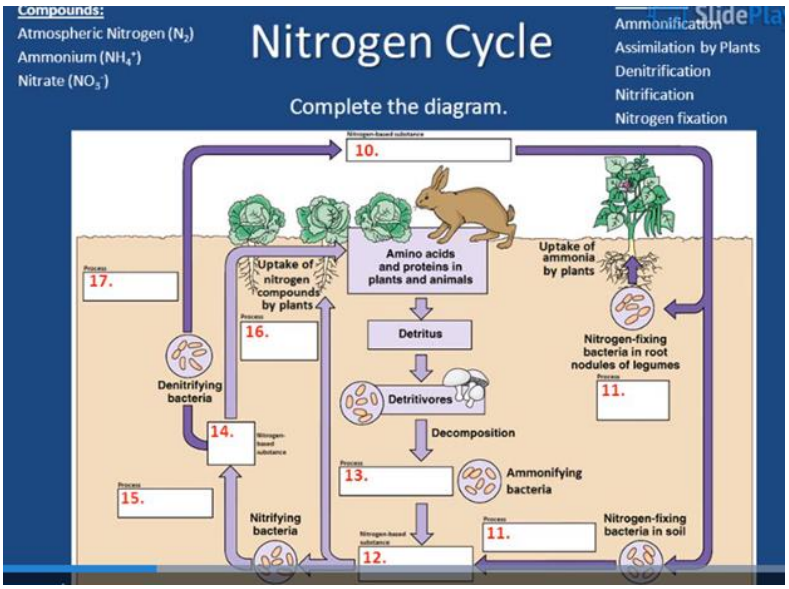
Directions: After watching the Carbon Cycle video, use the word bank to fill in the blanks in the diagram.



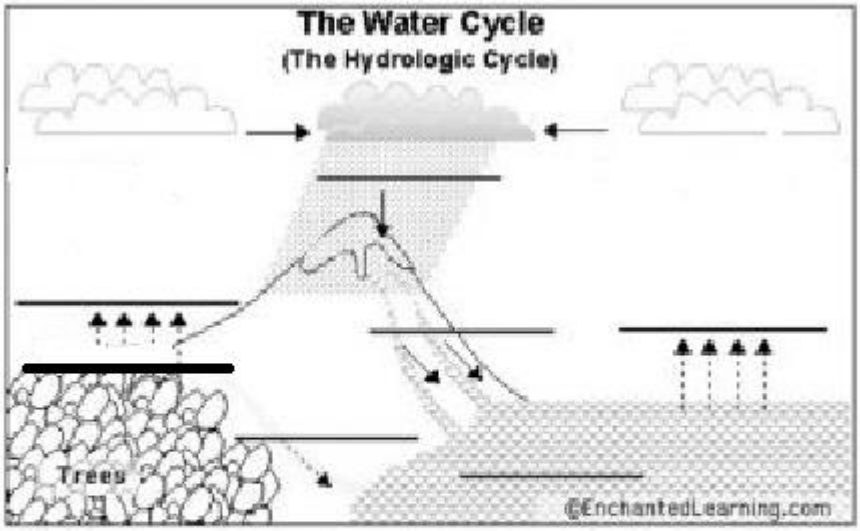
CARBON CYCLE WORD BANK

- Auto and factory emissions
- Photosynthesis
- CO2 Cycle
- Fossils and fossil fuels
- Root Respiration
- Decay Organisms
- Waste Products
- Plant Respiration
- Sunlight
- Animal Respiration
- Ocean Uptake
- Organic Carbon

7. Answer the following questions about the nitrogen Cycle
   a) Our atmosphere is _____ nitrogen gas.
   b) Only special bacteria can directly use nitrogen in our atmosphere and "fix" it so other organisms can benefit. These bacteria are called _____-_____ bacteria.
   c) The process in which ammonia in the soil is converted to nitrates is called _____.
   d) _____ is the process in which nitrogen is added back into the atmosphere.
   e) When nitrogen gas from the air is made into nitrogen compounds, it is called _____.
   f) Besides nitrogen fixation, nitrogen is changed from atmospheric nitrogen into nitrogen compounds by _____.
   g) Fill in the following diagram:



8. Answers the following questions about the water cycle
    a) Water is entered back into the atmosphere through the processes of _____ and _____.
    b) Water leaves the atmosphere through the process of _____.
    c) The main ways that water gets back to the ocean is by _____ and _____.
    d) Most of the Earth's water is stored in the _____ and the _____.
    e) Fill in the diagram of the water cycle.



Word Bank

- Precipitation
- Evaporation
- Transpiration
- Ocean
- Surface runoff
- Seepage/Groundwater

<u>Photosynthesis and Cellular Respiration</u>

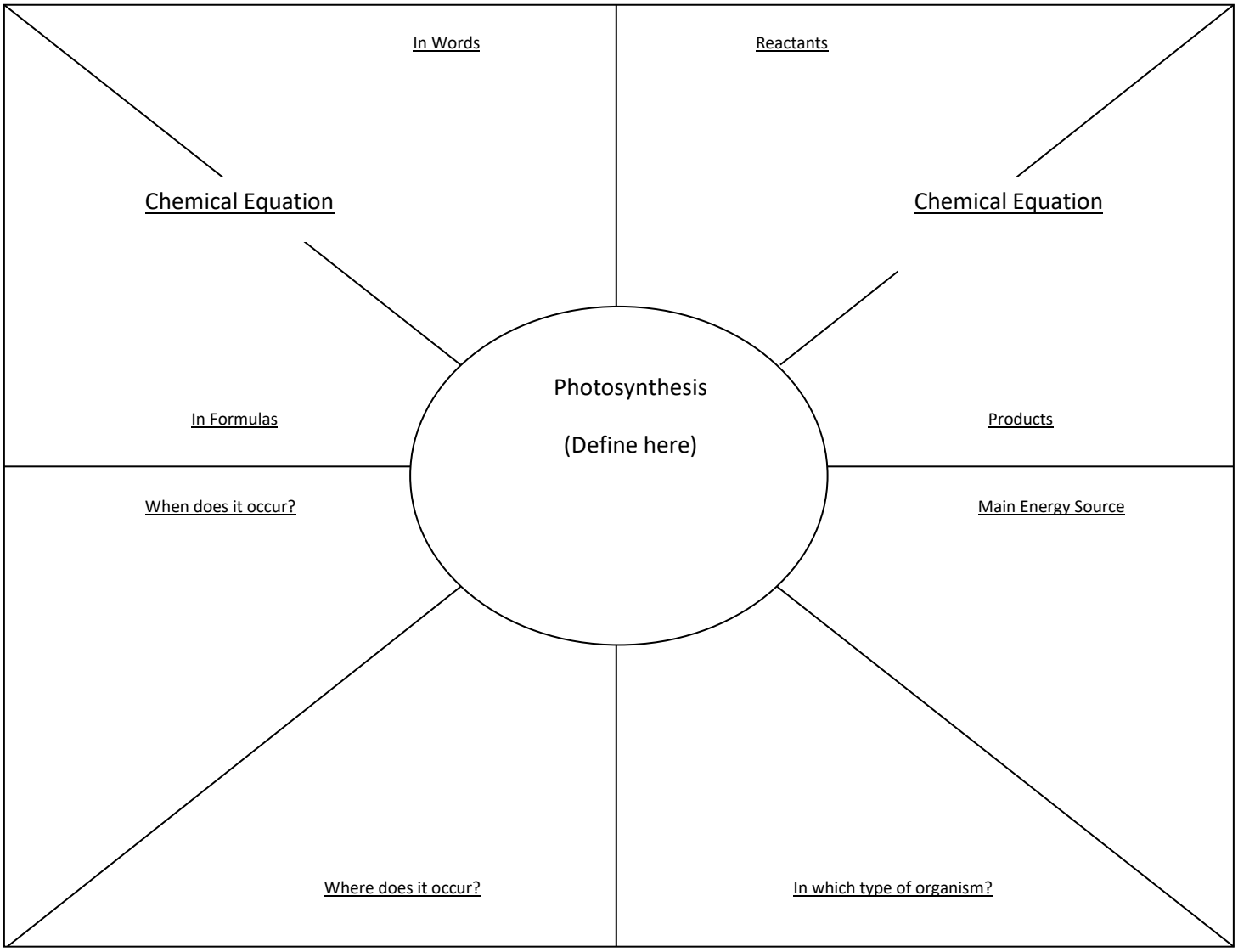
9. What is the equation for photosynthesis in both words and formulas?
   Words:

   Formulas:
10. Describe the energy transformation in photosynthesis:
    Photosynthesis: _____ energy ⇨ _____ energy

    _____ (from where?) _____ (molecule)

11. Give a brief summary of photosynthesis in your own words.

12. Fill in the following



13. Fill in the following table comparing the Light-dependent and Light-independent reactions of photosynthesis.

Process	**Location**	**Reactants**	**Products**	**Type of Energy Required**
Light Dependent Reactions				
Light Independent Reactions **Also known as:**				

14. What is the name of the primary pigment in photosynthesis? _____

15. What is the function of the stomata?

16. What is the equation for cellular respiration in both words and formulas?
    Words:

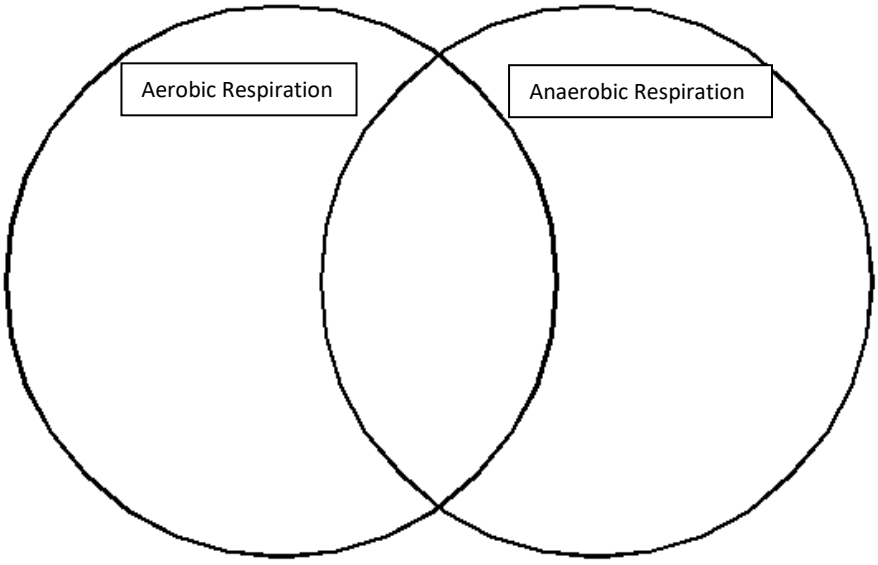
    Formulas:

17. Describe the energy transformation in cellular respiration:
    Cellular Respiration: _____ energy ⇨ _____ currency of cells

    _____ (molecule) _____ (molecule)

18. Which types of cells would tend to have the most mitochondria? Why?

19. Fill in the following Venn diagram.



20. Give a brief summary of cellular respiration in your own words.

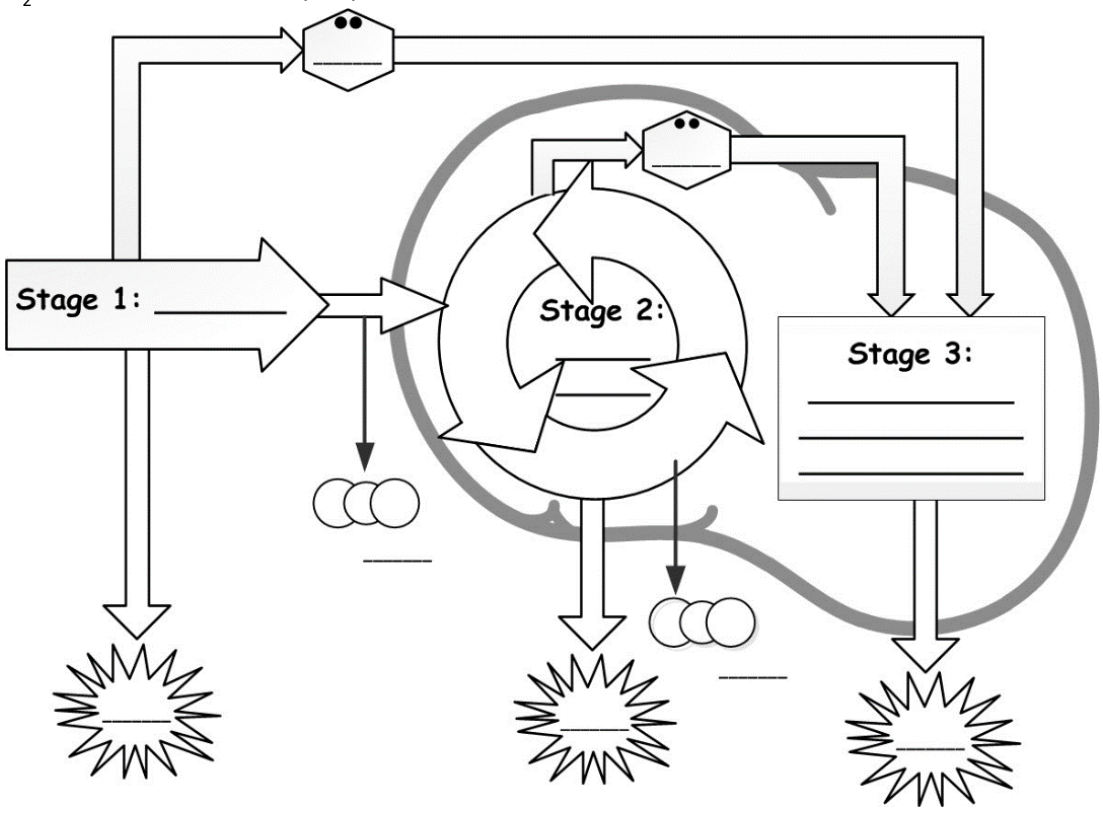
21. Fill in the table for the three steps of respiration.

Step 1	Step 2	Step 3
Name:	Name:	Name:
Location:	Location:	Location:
ATP Production:	ATP Production:	ATP Production:

23. Why is ATP sometimes compared to currency?

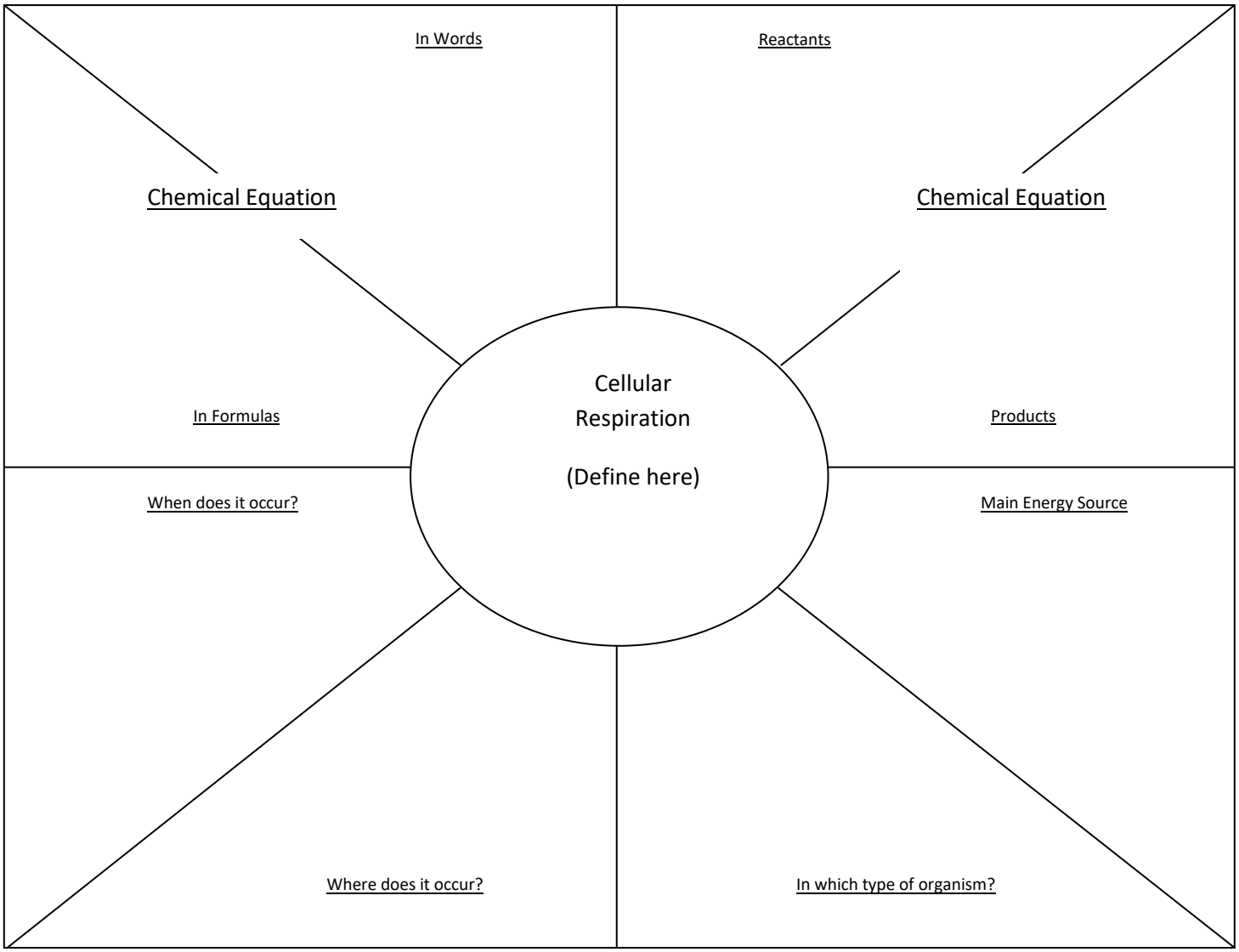
24. Label the diagram below with the following terms.

ATP
CO_2
Electron Transport Chain
Glycolysis
Krebs Cycle
NADH



25. What is the ultimate source of energy in virtually all biological systems? Explain.

26. Fill in the following:



27. How are cellular respiration and photosynthesis related?

DNA and Gene Expression

1. Define the following terms:
    a. Gene

    b. Transcription

    c. Translation

2. Put the following in order to describe DNA replication:
    _____ Free nucleotides bind to exposed bases following the Base Pair Rule.
    _____ New hydrogen bonds are formed.
    _____ The cell is ready to divide.
    _____ Two identical double helices are formed.
    _____ The hydrogen bonds between bases break; so the DNA double helix comes apart down the middle like a zipper.

3. Describe the products of DNA replication.

4. The shape of a DNA molecule is a _____. Its monomer is a _____. It is made up of _____ strands.

5. What are the three parts of a nucleotide? Draw one.

6. Describe the base pair rule for both DNA and RNA.

    DNA RNA

7. List four differences between DNA and RNA.

8. The two steps of protein synthesis are

   #1 _____ which occurs in the _____ of the cell and uses _____ as a template. This purpose of this step of protein synthesis is to make a strand of _____ to carry the _____ for making a protein to the ribosome.

   #2_____ which occur on the _____ of the cell uses the _____ made in transcription. The purpose of this step of protein synthesis is to assemble _____ using the instruction in mRNA.

9. The molecule made during transcription that carries the instructions to make a protein to the ribosome is called _____. The molecule that brings amino acids to the site of translation is _____.

10. Proteins are made up of _____.

11. What is a codon?

12. What amino acid has the codon GUA?

13. What amino acid will arise from the DNA segment of CGA?