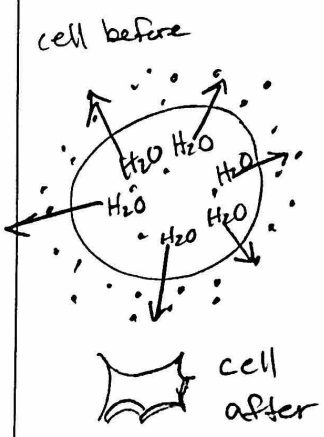
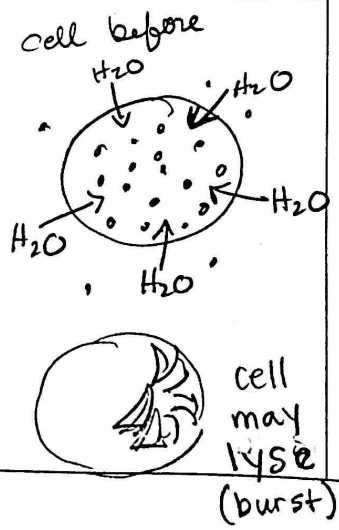
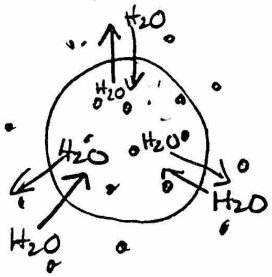
KEY

Unit 4 Study Guide

Cell Transport, Photosynthesis, Cellular Respiration, Fermentation

Cell Transport

1. What is a solute? Substance being dissolved
2. What is a solvent? substance dissolving the solute
3. What is a solution? solute dissolved in solvent
4. What is concentration? How is it measured? Concentration is the mass of solute in a given volume of solvent. (mass/volume) (g/mL)
5. Why is the cell membrane referred to as the selectively permeable membrane? The cell membrane chooses which materials are able to enter and leave the cell.
6. What is Passive Transport? Movement of materials w/out using cell energy.
   a. What are 3 types of passive transport – describe each
      i. Diffusion- Movement of particles from an area of high concentration to an area of low concentration.
      ii. Facilitated Diffusion- Diffusion that uses a helper protein.
      iii. Osmosis - Movement of water from an area of low solute concentration to an area of high solute concentration.
7. What is Active Transport? Movement of materials that requires cell energy
   a. What are 3 types of active transport – describe each
      i. Protein Transport - uses pumps and ATP to move molecules into & out of the cell.
      ii. Endocytosis- cell membrane stretches out and moves large molecules into the cell.
      iii. Vesicles containing large molecules fuse with the cell membrane and push the large molecules out of the cell.
8. What is tonicity? The concentrations of solutes that determine the direction of osmosis.
9. Tonic Solutions – Fill in the following table:

	Hypertonic	Hypotonic	Isotonic
Definition:	Solution that has a high concentration.	Solution that has a low concentration	solution that has equal solute inside & outside of cell
What happens to the cell?	Cell shrivels	cell swells	cell stays same
Draw 2 pictures, a before and after, of a cell in each solution?			

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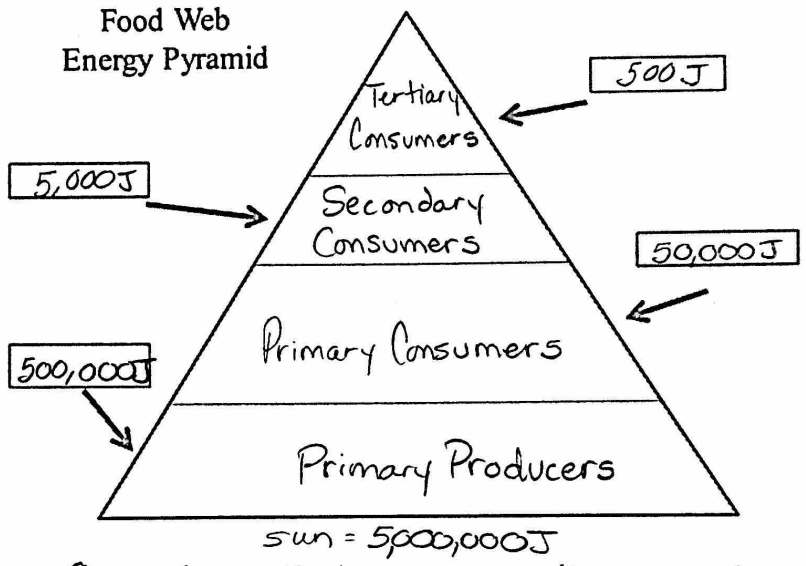
Food Chain/Trophic Levels/Energy Pyramid

10. What are the trophic levels in order starting with the sun? Define each.
    a. Primary Producer - (Autotrophs) Make their own food
    b. Primary Consumer - (Heterotrophs) Eat Primary Producer
    c. Secondary Consumer - (Heterotrophs) Eat Primary Consumer
    d. Tertiary Consumer - (Heterotrophs) Eat Secondary Consumer
11. Label the energy pyramid and write the amount of energy available to the subsequent trophic levels if the sun started off with 5,000,000 J of energy.



12. Define heterotroph: Organism that consumes other organisms for energy.
13. Define autotroph: Organism that uses energy from sun or chemicals to produce its own food.

Photosynthesis

14. What is goal of photosynthesis? To convert light energy into chemical energy in the form of glucose
15. Where does photosynthesis occur? Chloroplast
16. What is the stroma? liquid/jelly-like fluid surrounding grana.
17. What is a thylakoid? A disc shaped structure that absorbs light energy.
18. What are grana? Stacks of thylakoids
19. What is chlorophyll and where is it found? Chlorophyll is found in the thylakoids of the chloroplast. Chlorophyll is the light absorbing pigment.
20. What wavelengths of light does chlorophyll absorb? Red & Blue
21. What wavelengths of light does chlorophyll reflect? Green
22. What are the light dependent reactions? They are the 1st reactions of Photosynthesis that absorb light energy.
23. What is the Calvin cycle? It is the 2nd series of reactions in Photosynthesis that uses energy & CO_2 to build glucose.
24. What does the Calvin cycle produce using CO_2 molecules? Glucose = $C_6H_{12}O_6$
25. Write the chemical equation for photosynthesis:

$$\text{Sunlight} + H_2O + CO_2 \rightarrow O_2 + C_6H_{12}O_6$$

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26. Where do the reactants for photosynthesis come from? Light comes from sun, water comes from soil and CO_2 comes from the air
27. What happens to the products of photosynthesis? Both O_2 + glucose are used by the plant and other organisms to produce ATP.
28. What are the stomata? Small openings underneath plant leaves that let in CO_2 + let out O_2
29. Label the stroma, thylakoids, and grana of the following chloroplast:

FIGURE 1-CHLOROPLAST