

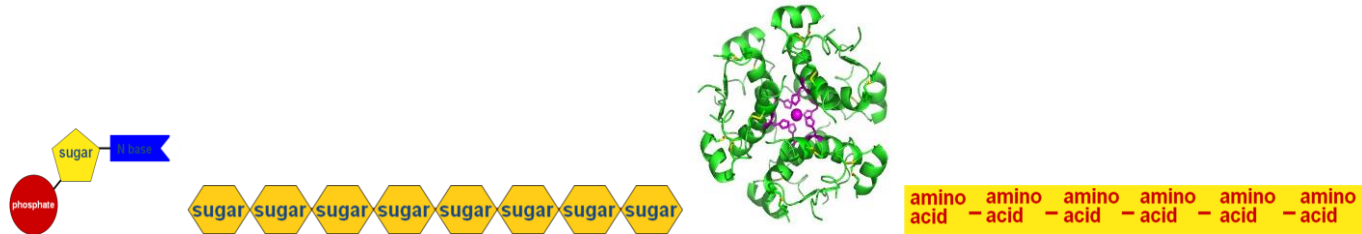
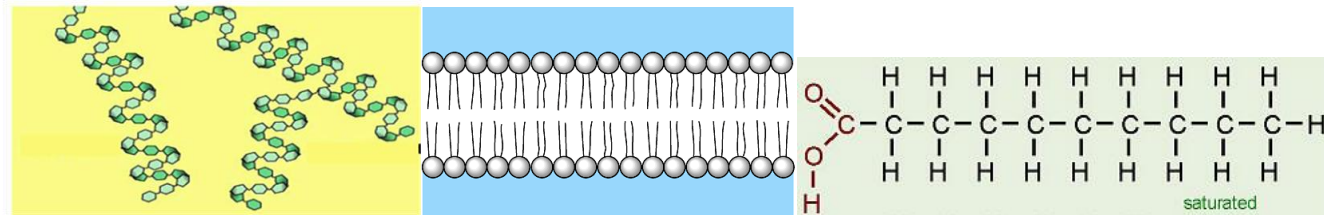
Biology SAGE Review – Standard dos

Name _____ Period _____

	Main Idea	How I will prove my infinite knowledge			
1-7	List the major chemical elements in cells	<p>The major chemical elements that compose cells have an acronym: CHNOPS (carbon, hydrogen, nitrogen, oxygen, phosphorous, sulfur) there are also trace elements.</p> <div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p>Trace elements (less than 0.01%)</p> <p>Nitrogen (3.3%)</p> <p>Hydrogen (9.5%)</p> <p>Carbon (18.5%)</p> <p>Oxygen (65%)</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;"> <p>Calcium (1.5%) Phosphorus (1.0%) Potassium (0.4%) Sulfur (0.3%) Sodium (0.2%) Chlorine (0.2%) Magnesium (0.1%)</p> </div> </div> <div style="flex: 2; padding-left: 20px;"> <p>What element is most abundant in your body?</p> <p>What % of your body is carbon?</p> <p style="padding-left: 40px;">1. Where do you get carbon?</p> <p>What % of your body is hydrogen?</p> <p>What % of your body is nitrogen?</p> <p style="padding-left: 40px;">Where do you get nitrogen?</p> <p>What major macromolecule has nitrogen?</p> </div> </div>			
8-11	Identify the function of the four major macromolecules	Name the function of: carbohydrates, proteins, lipids, fats, nucleic acids.			
		CARBOHYDRATES	PROTEINS	LIPIDS	NUCLEIC ACIDS

12-24

- Label each of these structures.



Tell me how the structure of these macromolecules aids in function:

Carbohydrate:

Protein:

Lipids:

Nucleic Acid

What does "organic" mean?

25-28

Explain how the properties of water contribute to maintenance of cells in living organisms.

What is cohesion?

What is adhesion?

How is cohesion and adhesion important to life, especially plants? (Think capillary action)

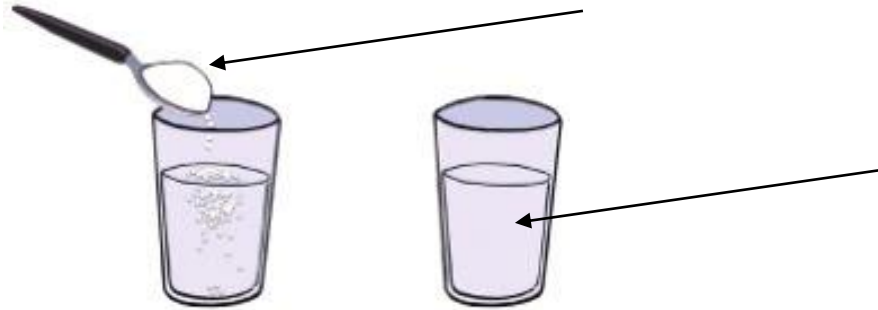
Explain why it is important that water dissolves substances in the body.

29-31

Explain polarity and why it enables water to dissolve substances.

How does the heat capacity of water help maintain homeostasis?

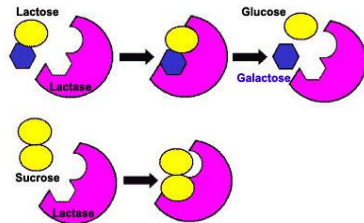
Label & Describe what is happening in this picture, using the terms “solvent”; “solute” and “solution”



32-34

Explain the role of enzymes in cell chemistry.

Why must we have thousands of different enzymes, instead of thousands of the same enzymes?



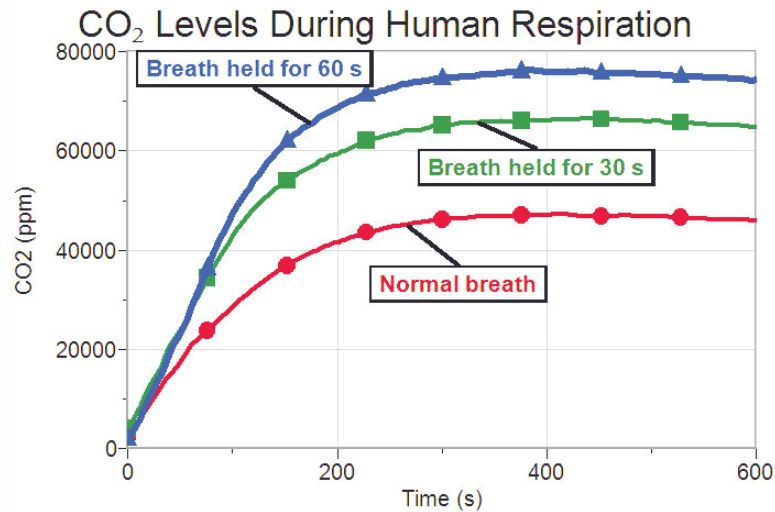
Explain what is happening in the picture on the left:

What EXACTLY do Enzymes do?

In a graph or picture, show how enzymes lower activation energy (the energy required to get a chemical reaction going).

	<p>All organisms are composed of one or more cells that are made of molecules, come from preexisting cells, and perform life functions.</p> <p>Objective 2: Describe the flow of energy and matter in cellular function</p>	
34-39	Distinguish between autotrophic and heterotrophic cells.	<p>Define autotrophic:</p> <p style="padding-left: 40px;">Where would you find an autotrophic cell?</p> <p>Define heterotrophic:</p> <p style="padding-left: 40px;">Where would you find a heterotrophic cell?</p> <p>What parts of the cell would be different in an autotrophic vs. heterotrophic cell?</p>
40-45	Illustrate the cycling of matter and the flow of energy through photosynthesis and respiration	<p>Define Photosynthesis using words:</p> <p>Define Photosynthesis using a chemical equation:</p> <p>Define Respiration using words:</p> <p>Define Respiration using a chemical equation:</p> <p>What is fermentation?</p> <p>Draw a picture of a carbon atom being photosynthesized, eaten and then respired.</p> <p>When we get energy from eating a plant or any food, where does the energy come from? (hint: something breaking)</p>

Measure the production of one or more of the products of either photosynthesis or respiration.

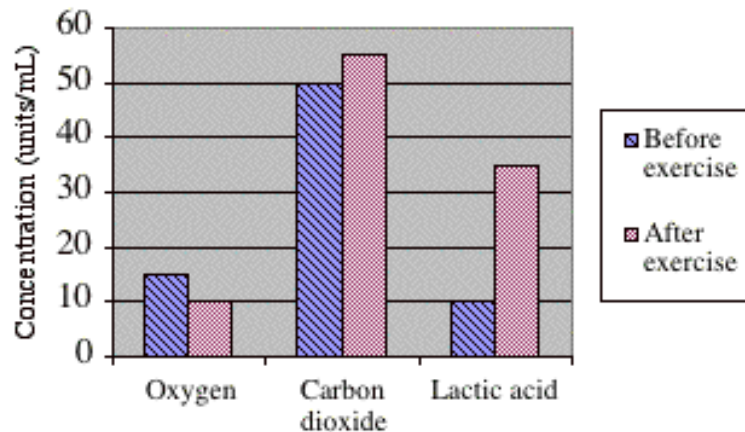


What does this data show?

Why might CO₂ levels have increased after holding breath for 60 s?

An investigation was carried out to determine what factors cause an increase in the rate of breathing during exercise. Samples of blood oxygen, blood carbon dioxide, and blood lactic acid concentrations were collected from Alex before and after a period of exercise. The information is presented in the graph below. Alex's breathing rate before and after exercise was also measured. It increased from 12 breaths per minute before exercise to 27 breaths per minute after exercise.

Analysis of Arterial Blood Before and After Exercise



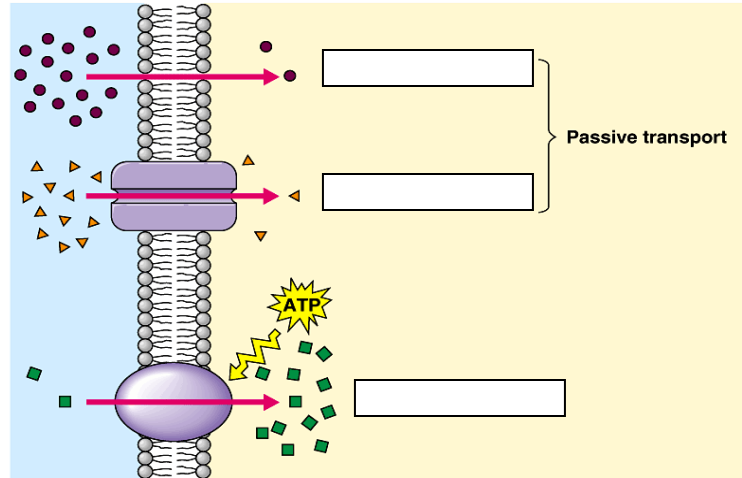
What is the difference between carbon dioxide concentrations before and after exercise?

- The concentration of carbon dioxide increased by 25
- The concentration of carbon dioxide increased by 5
- The concentration of carbon dioxide increased by .5
- The concentration of carbon dioxide remained the same
- The concentration of carbon dioxide decreased after exercise

49-55	<p>STANDARD II: Students will understand that all organisms are composed of one or more cells that are made of molecules, come from preexisting cells, and perform life functions.</p> <p>Objective 3: Investigate the structure and function of cells and cell parts.</p>	
	<p>Explain how cells divide from existing cells.</p>	<p>Draw the Cell cycle on page 134 in your book. I won't make you draw out all steps in mitosis, but you do need to tell me what happens in each stage of mitosis (look on page 141 for help). Include this information on your drawing.</p> <p>What stage does a cell spend the longest amount of time?</p>
56-60	<p>Describe cell theory and relate the nature of science to the development of cell theory</p>	<p>What is the cell theory? (page 71)</p> <p>1 –</p> <p>2 –</p> <p>3 –</p> <p>Give me a specific example of how “theories are built upon previous knowledge, use increasingly more Sophisticated technology and rely on the skills of many scientists. I want detail people! Look on page 70-71 for help.</p>

61-62

Describe what is happening in this picture AND label each as either facilitated diffusion; diffusion or active Transport. Also tell me if they are going from high to low or low to high.

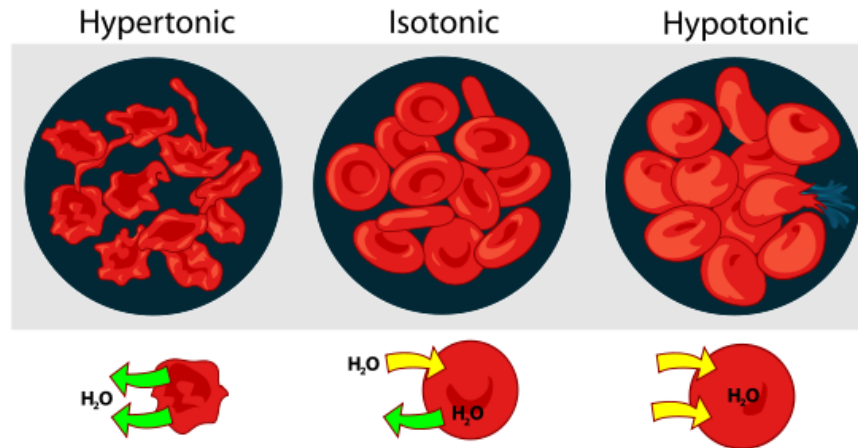


Describe how the transport of materials in and out of cells enables cells to maintain homeostasis

How does osmosis and diffusion help cells maintain homeostasis? Think about our last unit for Pete's sake!

63

Explain what is happening to the cells in these pictures:



Give a real life example of a hypertonic solution and what happens to your body if you drink salt water:

		An organelle is just a miniature organ in each of your cells. Draw and list the function of each organelle below:		
64-66	Describe the relationship between the organelles in a cell and the function of that cell	NUCLEUS	RIBOSOME	GOLGI APPARATUS
67-69		VESICLES	MITOCHONDRIA	VACUOLE
70-72		LYSOSOME	CHLOROPLASTS	What does it mean if a cell is Eukaryotic? Prokaryotic? What do autotrophic cells have that heterotrophic don't?
74		CELL MEMBRANE WITH PROTEIN CHANNELS		