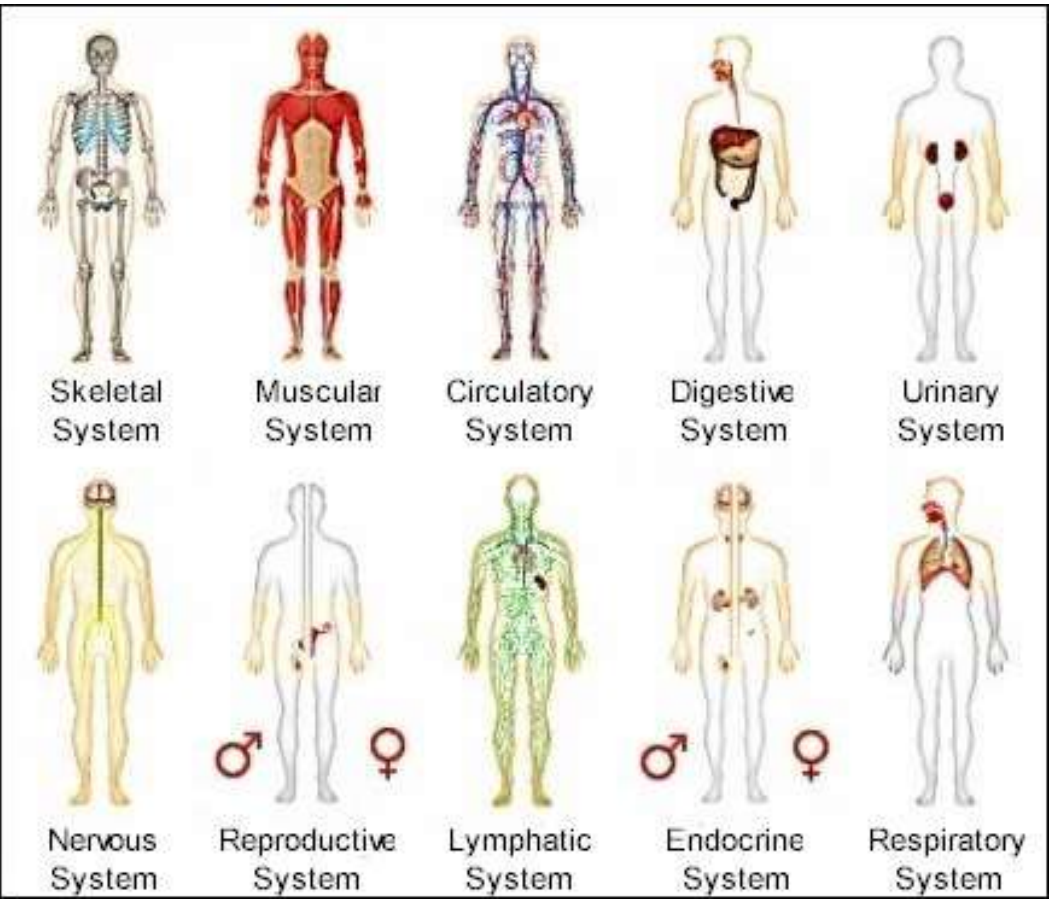
9/14 Review for Body Systems Test

Obj. TSW write a well thought out response to a written question about body systems, and accurately find the Claim, Evidence, Reasoning and AXES paragraph for a scientific article. P. 38 NB



1. What is a claim? How do you know when you have found it in an article?
2. What is evidence? How do you know when you have found it in an article?
3. What is the reasoning? How do you know when you have found the support for the evidence?

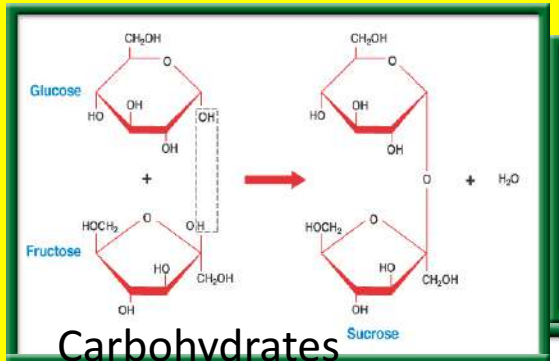
Cells

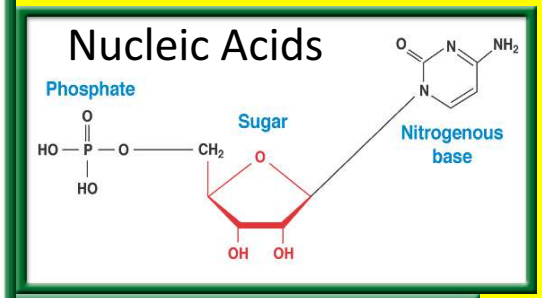
Week 5

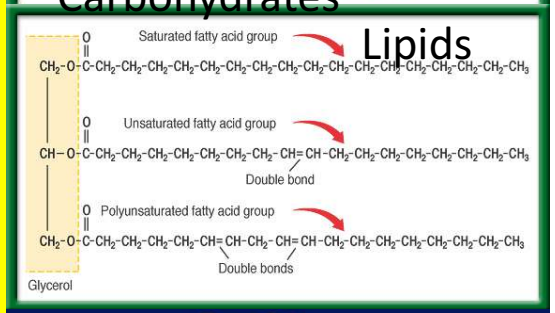
Macromolecules, Enzymes, Organelles, Microscopes & Cells, Photosynthesis & Cellular Respiration

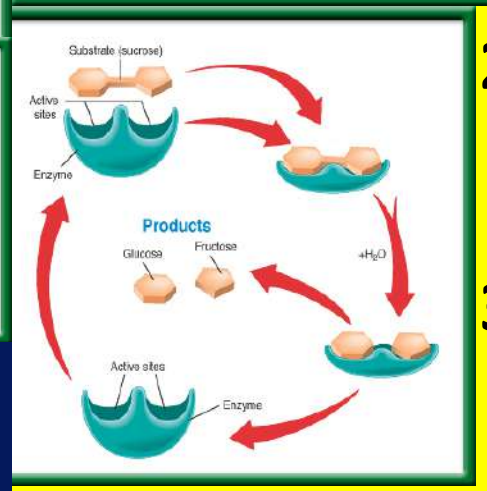
02/16 Life Substances (Macromolecules) 6.3

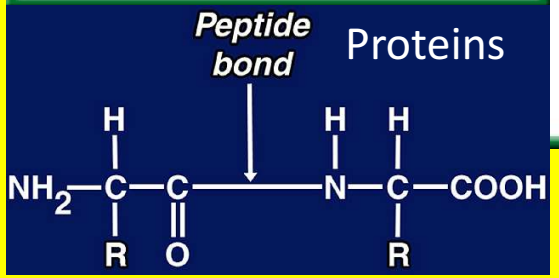
Obj. TSW explain the four Biomolecules (Macromolecules, Polymers) & how they are made from smaller molecules (monomers) by making a foldable & doing the Monsters in the pond water lab. P. 40NB











cellsalive.com

1. Carbon is the basic atom that forms molecular chains. Describe what a Biomolecule is, and **name the four Biomolecules.**
2. **Compare & Contrast the 4 Biomolecules,** (Macromolecules).
3. **Why are these Biomolecules important**?

Warm Up 02/16

Obj: TSW make observations & develop an experiment in order to explain what was observed in the Color Changing Milk Demo.(pg. 40 NB)

- Write down 3 things you observed from the Color Changing Milk Demo.

Color Changing Milk Lab (pg. 39 in NB)

"Every time I eat food coloring, I dye a little inside"

- Materials:
  - Plate, Milk, Food Coloring, Q-tips, & dish soap.
- Procedure:
  1. Pour enough milk onto the plate to just cover the bottom completely.
  2. Add food coloring using 4-5 drops for each spot.
  3. Take a Q-tip and dip it soap.
  4. Gently place Q tip, soap side down, into the milk & food coloring mixture. Make observations.
  5. Keep the Q-tip in mixture until movement stops.

- Be sure to record your work for this lab in your new, handy dandy, Experimental Design Graphical Organizer!
- You may use your phones to take pictures of the color changing milk if you wish.

Life Substances – Biomolecules & Macromolecules

All organic compounds contain carbon atoms, CH_4, C_2H_6.

#1. There are four principal types of organic compounds, or biomolecules, that make up living things: **carbohydrates, lipids, proteins, and nucleic acid.**

The structure of a biomolecule will help determine its properties and functions.

#1. Biological molecules (Biomolecule, macromolecules) make parts of cells and living things.

#2.

- **Carbohydrates**- compounds composed of carbon, hydrogen, and oxygen atoms. **Identifies the type of cell.** Ex. $C_6H_{12}O_6$ - sugar
- **Proteins-** made up of long chains of **nitrogen-containing** organic molecules called **amino acids**. Allow for transport of materials in and out of the cell.
- **Nucleic Acids-** organic compounds found in all living cells. Genetic Material.
    - **DNA**
    - **RNA**
- **Lipids-** smaller biological molecules that do not mix with water. Ex. **fats, waxes, oils and steroids**.

#3. Without these Biomolecules we would not have life because we would not have cells.

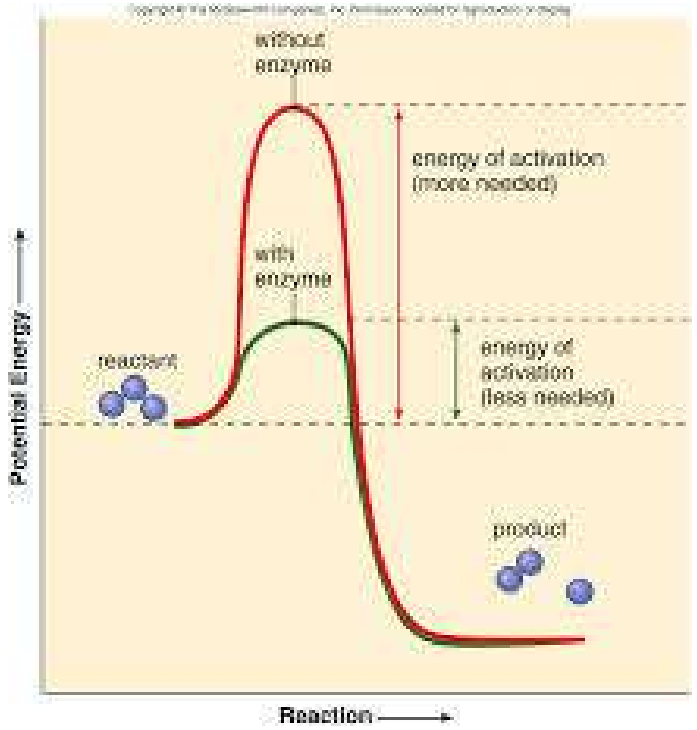
Take notes P. 41 NB

The structure of proteins

Enzymes are important proteins found in living things.

*An enzyme is a protein that changes the rate of a chemical reaction.

They speed the reactions in digestion of food.



Made up of Amino Acids (20)

Enzymes can be used again and again without being used up.

The structure of carbohydrates

A **carbohydrate** **is a biomolecule composed of carbon** (most abundant element with four available electrons to bond or share), hydrogen, and oxygen with a ratio of about two hydrogen atoms and one oxygen atom for every carbon atom.

Starch - Potatoes,
Cellulose - Cotton,

The structure of carbohydrates

The simplest type of carbohydrate is a simple sugar called a monosaccharide (mah noh SA kuh ride). (ie. glucose, fructose)

The largest carbohydrate molecules are polysaccharides, polymers composed of many monosaccharide subunits. (ie. potatoes, liver)

Element **Carbon** is the most abundant in living things.

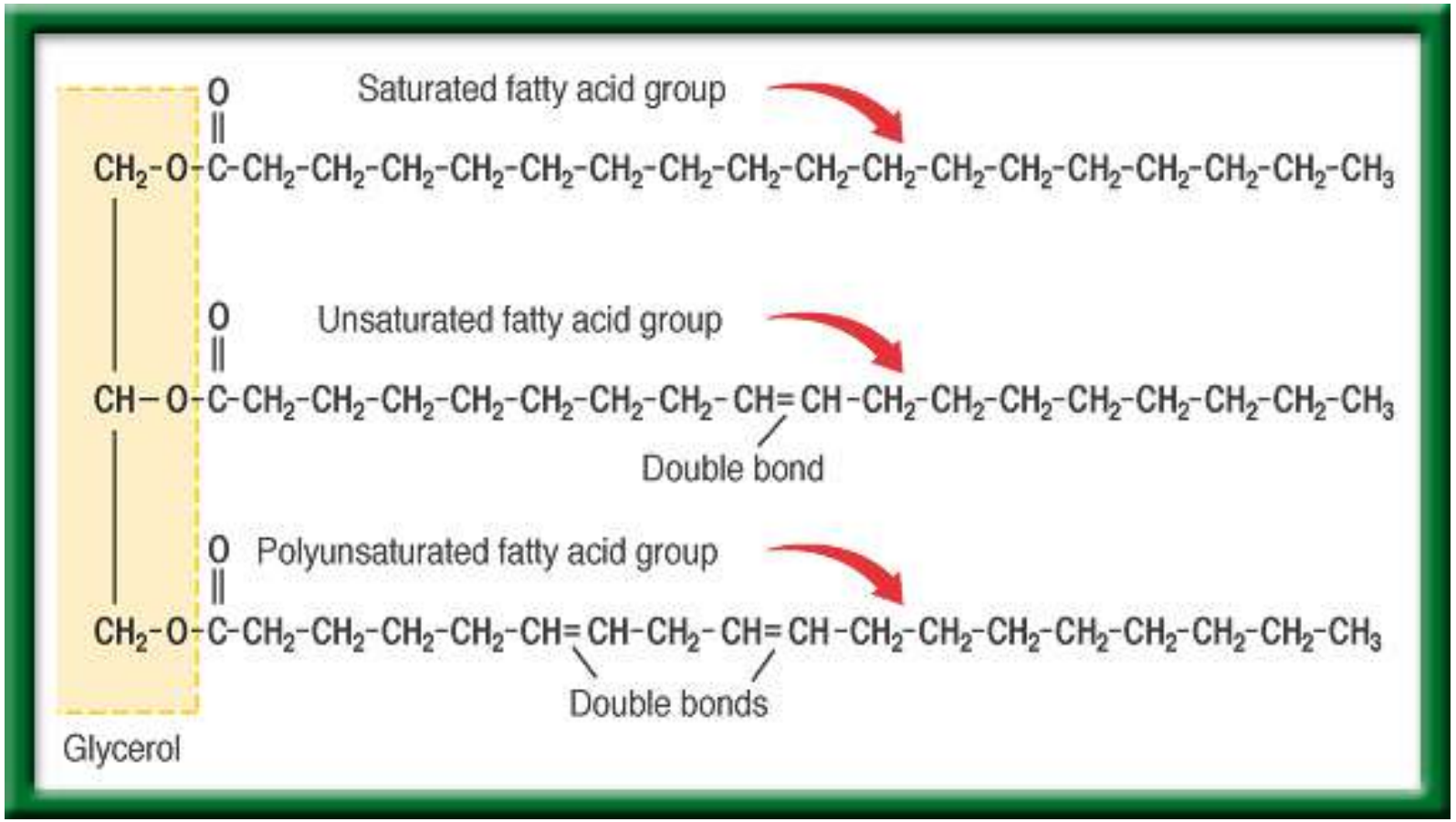
The structure of lipids

Lipids are large biomolecules that are made mostly of carbon and hydrogen with a small amount of oxygen. (ie. fats, oils, waxes)

They are insoluble in water because their molecules are nonpolar and are not attracted by water

Butter

Glycerol Chemistry



To return to the chapter summary click escape or close this document.

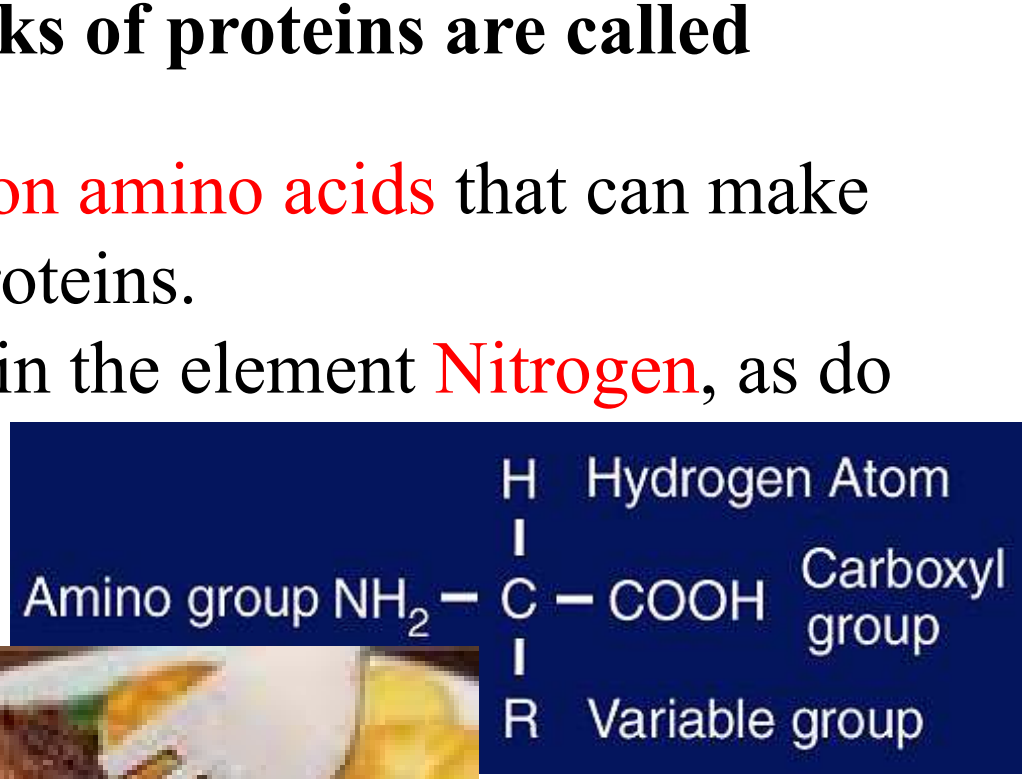
The structure of proteins

***The basic building blocks of proteins are called amino acids.**

There are about 20 common amino acids that can make literally thousands of proteins.

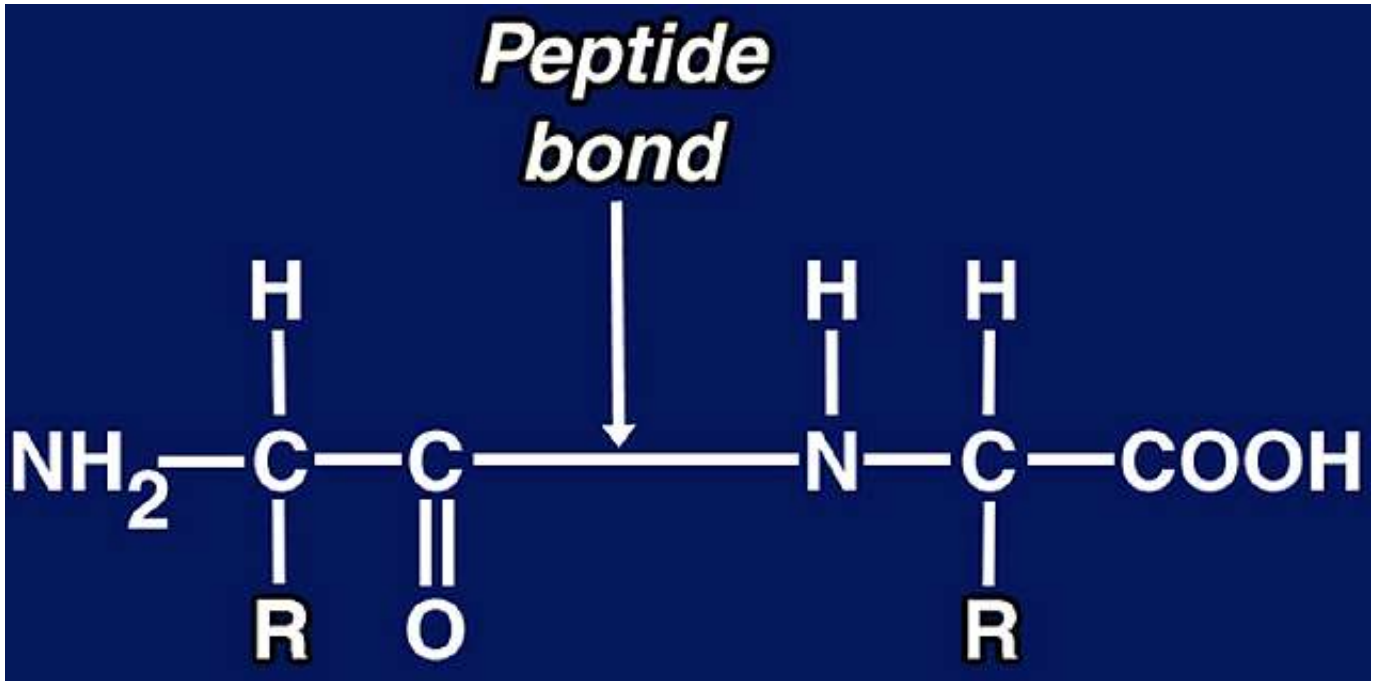
Notice, amino acids contain the element Nitrogen, as do Nucleic Acids

Meat, Muscle, Leather, Wool



The structure of proteins

Peptide bonds are covalent bonds formed between amino acids.



The structure of nucleic acids

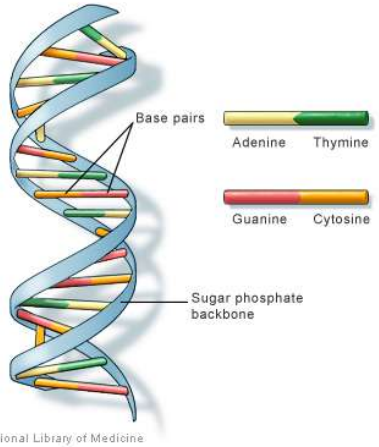
A nucleic (noo KLAY ihk) acid is a complex biomolecule that stores cellular information in the form of a code.

Nucleic acids are polymers made of smaller subunits called nucleotides.

The structure of nucleic acids

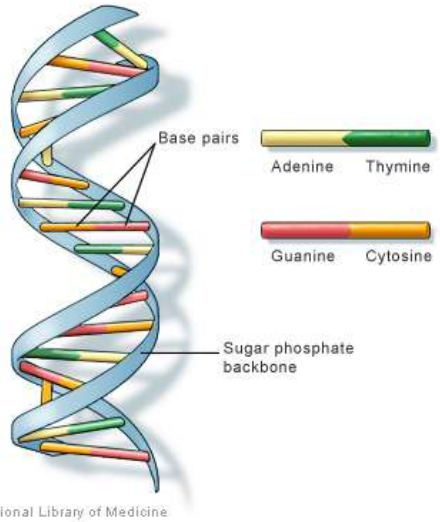
The information coded in DNA contains the instructions used to form all of an organism's enzymes and structural proteins.

Another important nucleic acid is RNA, which stands for ribonucleic acid. RNA is a nucleic acid that forms a copy of DNA for use in making proteins.

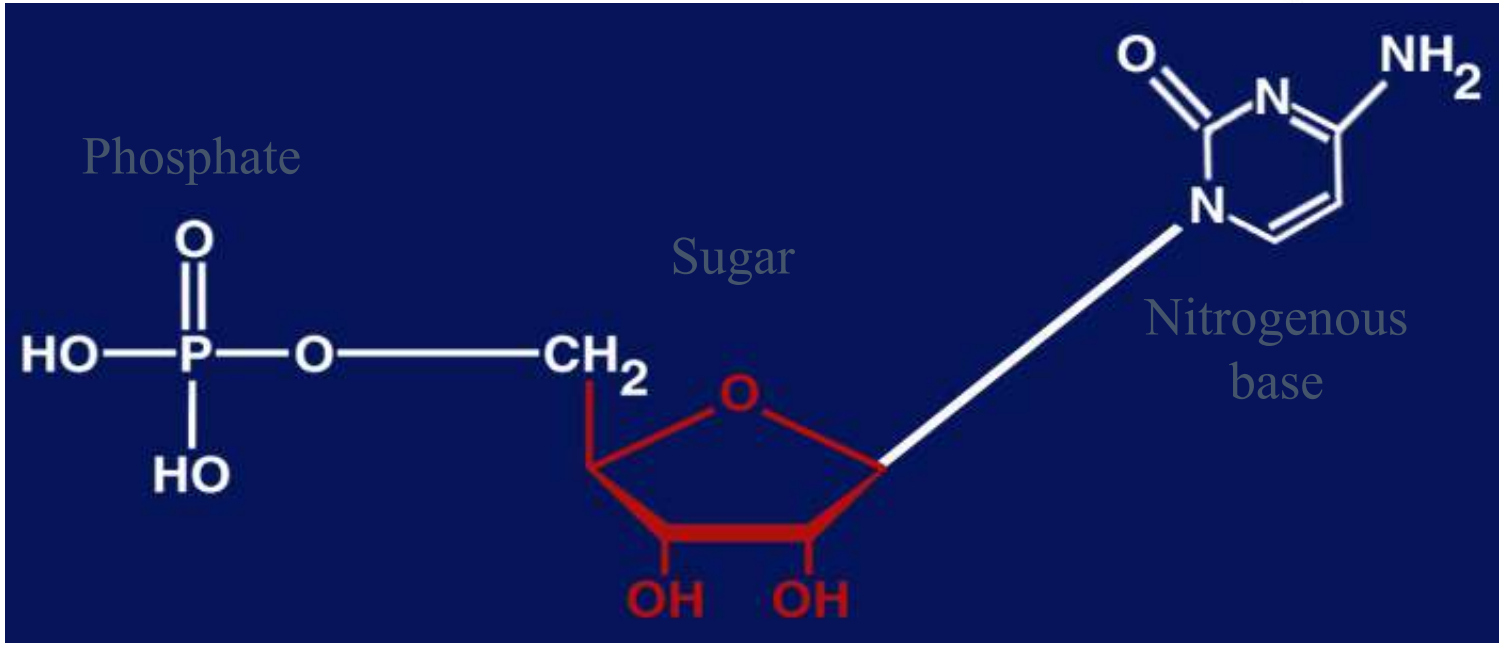


The structure of nucleic acids

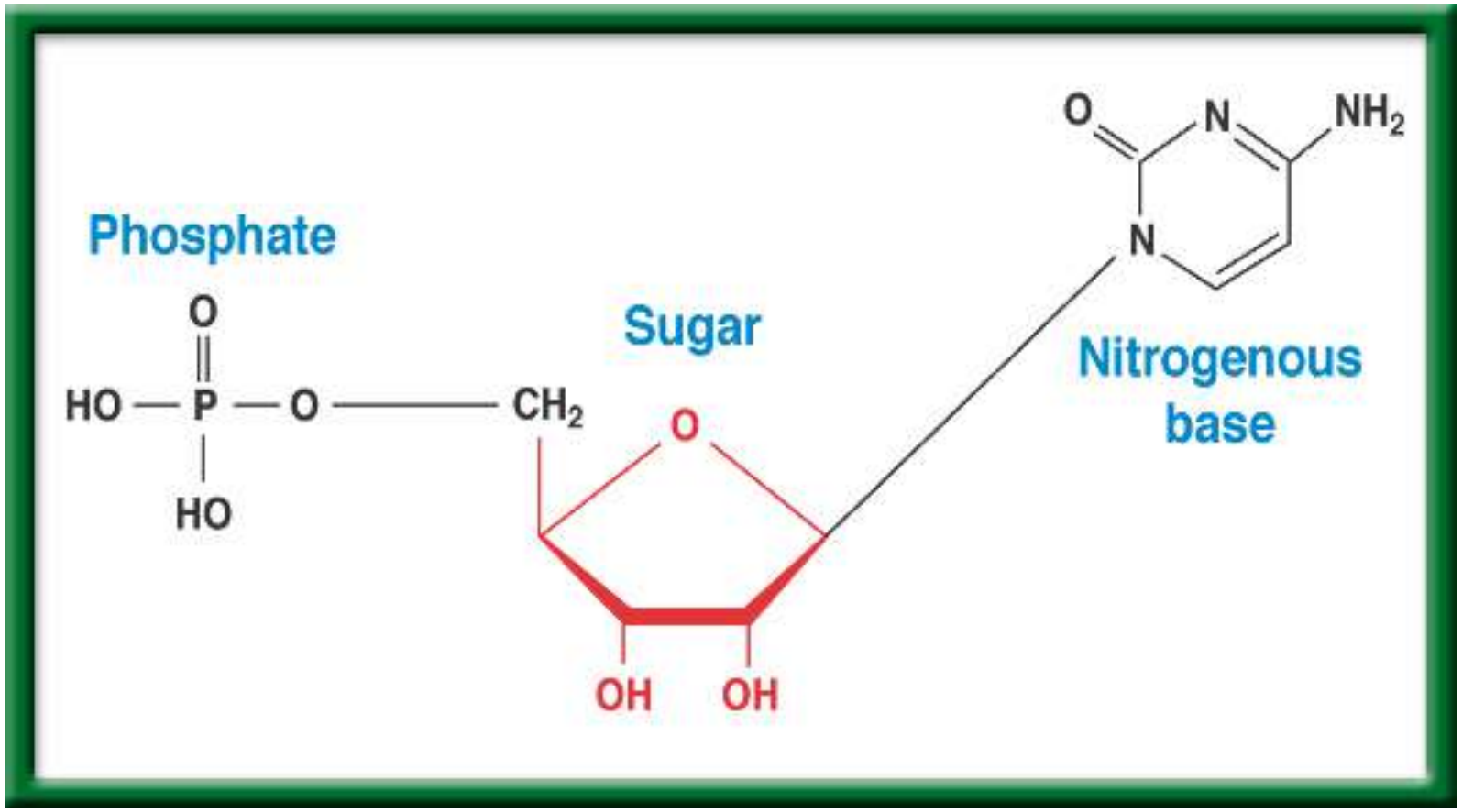
DNA, which stands for deoxyribonucleic acid is a nucleic acid.



U.S. National Library of Medicine



Nucleotides



To return to the chapter summary click escape or close this document.

02/17 Biomolecules CH 6.3
Obj. TSW analyze the similarities and differences between the 4 types of Biomolecules. P. 42 NB

1. What elements make up each of the 4 Biomolecules?
2. How do cells use each of the Biomolecules?
3. What biomolecules are in milk?

Reflection Milk Lab:
The structure of a biomolecule will help determines its properties and functions. P. 41NB

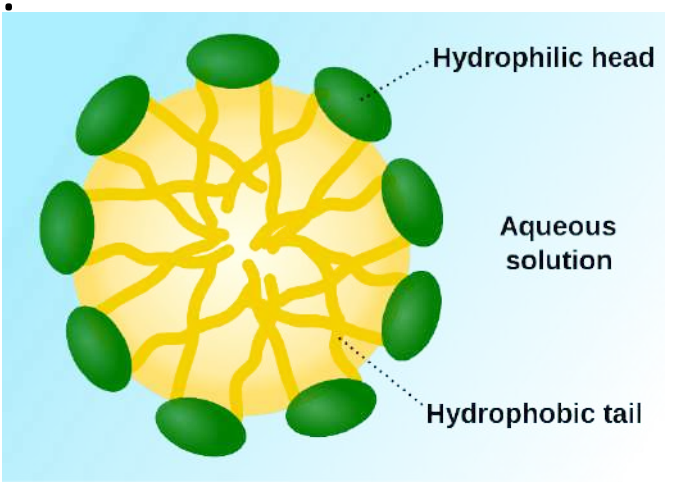
Yesterday in the Milk Lab, you noticed movement of the food coloring when you placed the soap covered Q-tip into the milk.

- What is milk made of?

From what you know about our Bio/macromolecules, which ones does milk have?

- Do oil and water mix?

How can this help explain the movement of the colored dye in the milk?

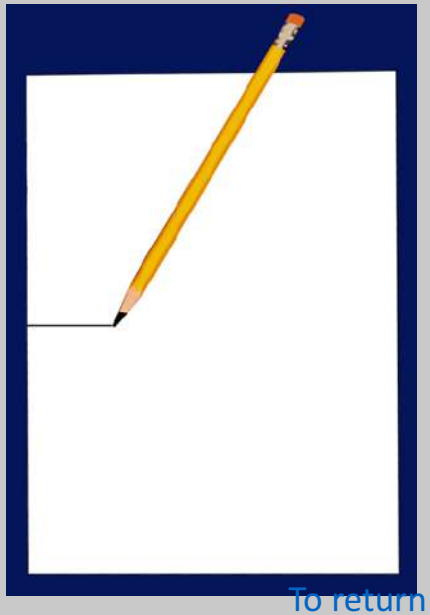


Chapter 6

Foldables Study Organizers

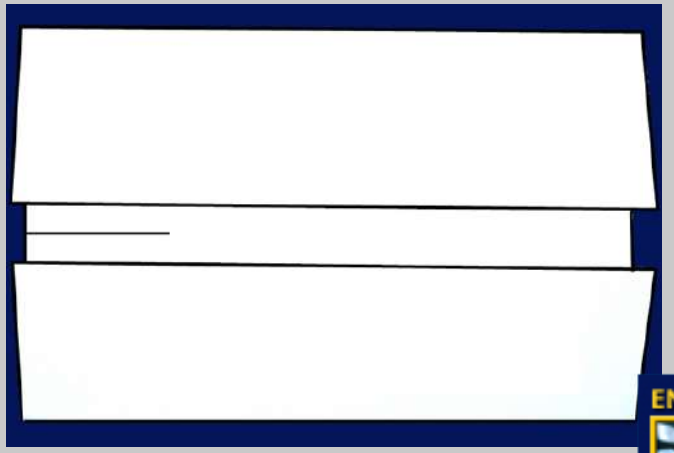
STEP 1

Draw a mark at the midpoint of a sheet of paper along the side edge.



FOLDABLES™ Study Organizer

Then fold the top and bottom edges in to touch the midpoint.



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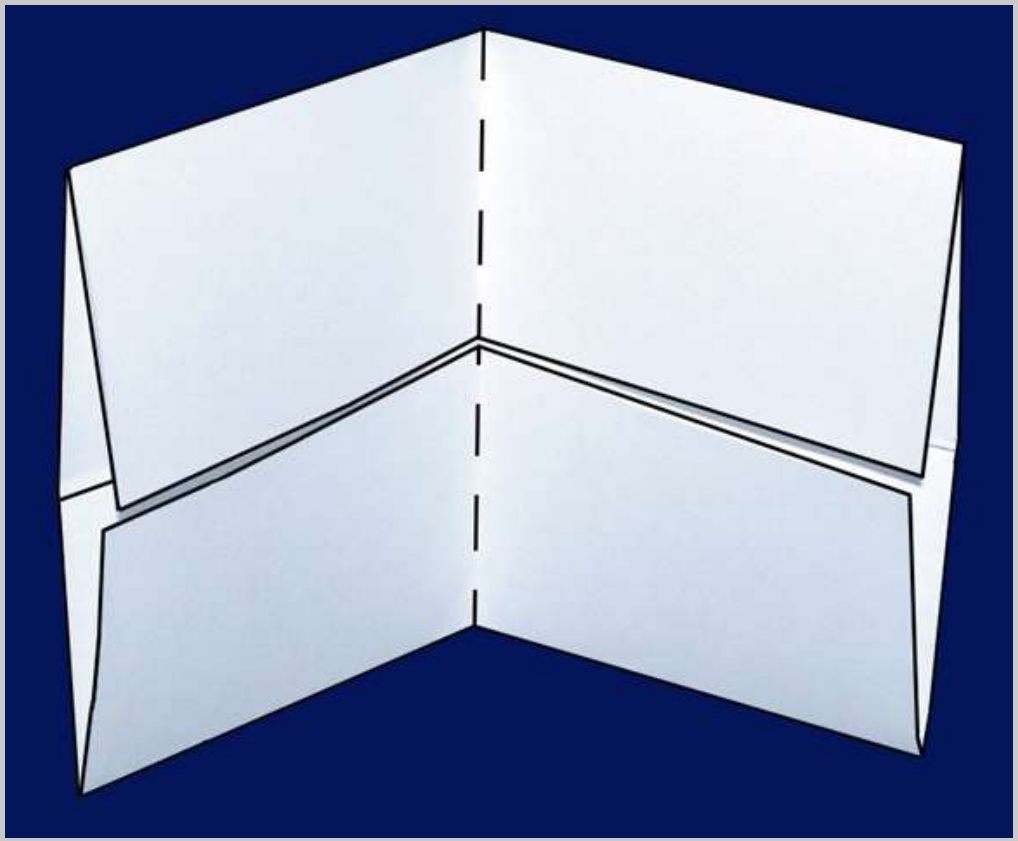
STEP 2

Fold in half from side to side.



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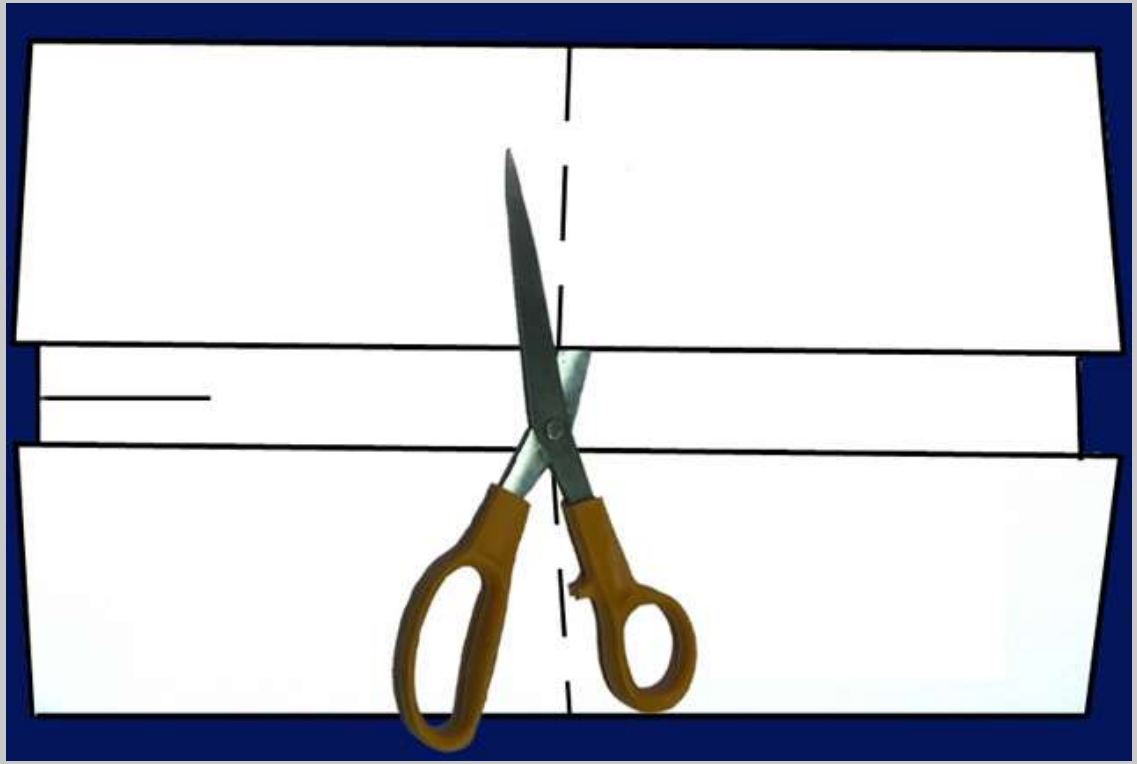
STEP 3

Open and cut along the inside fold lines to form four tabs.



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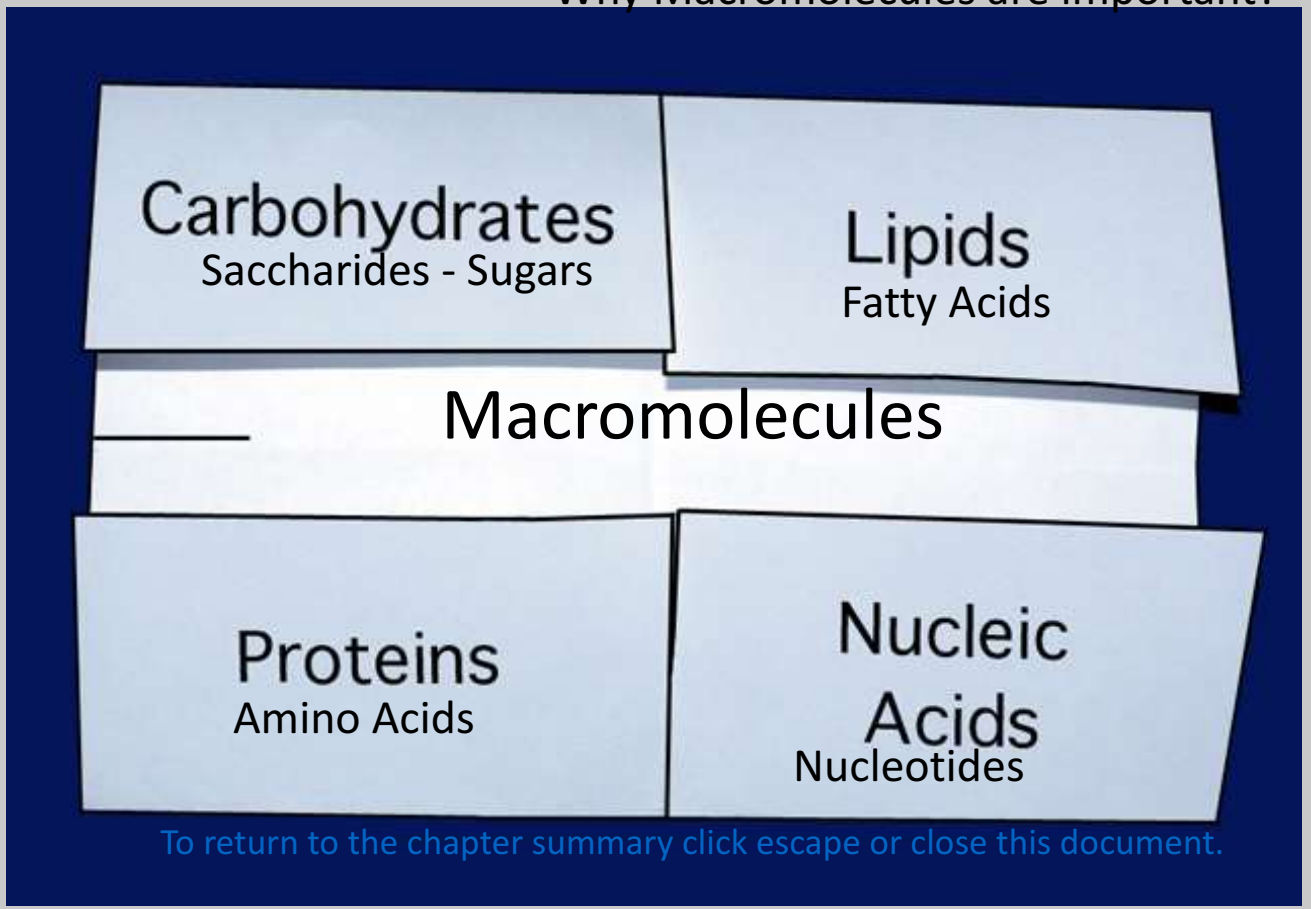
Chapter 6

Foldables Study Organizers

STEP 4 Label each tab.

CH 6.3 & 7.2

Write an example of each, part of cell membrane.
Give a definition of each.
Draw the molecular formula & a picture of each
Include the Subunit. P. 43NB
Why Macromolecules are important?

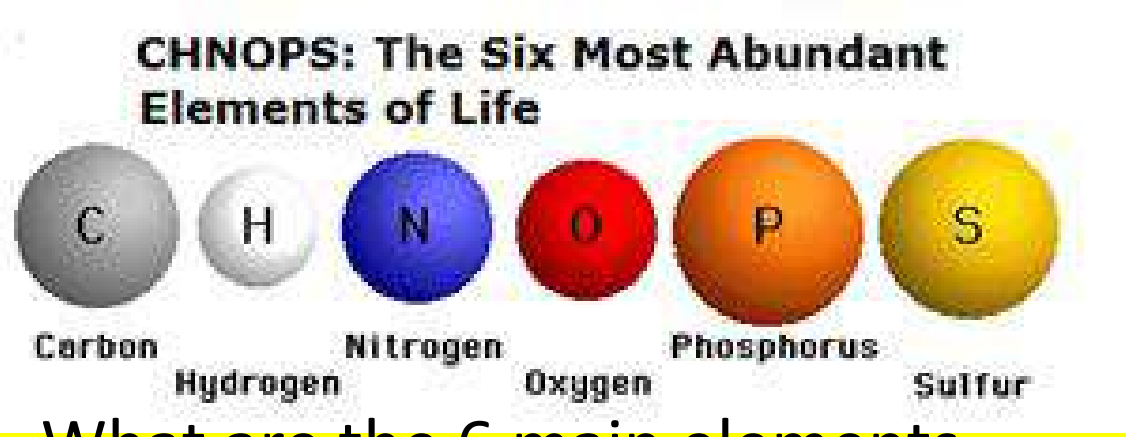


END OF SLIDE

PREVIOUS SLIDE | TABLE OF CONTENTS | NEXT SLIDE | RESOURCES

02/18 Building Molecules & Enzymes CH 6.3

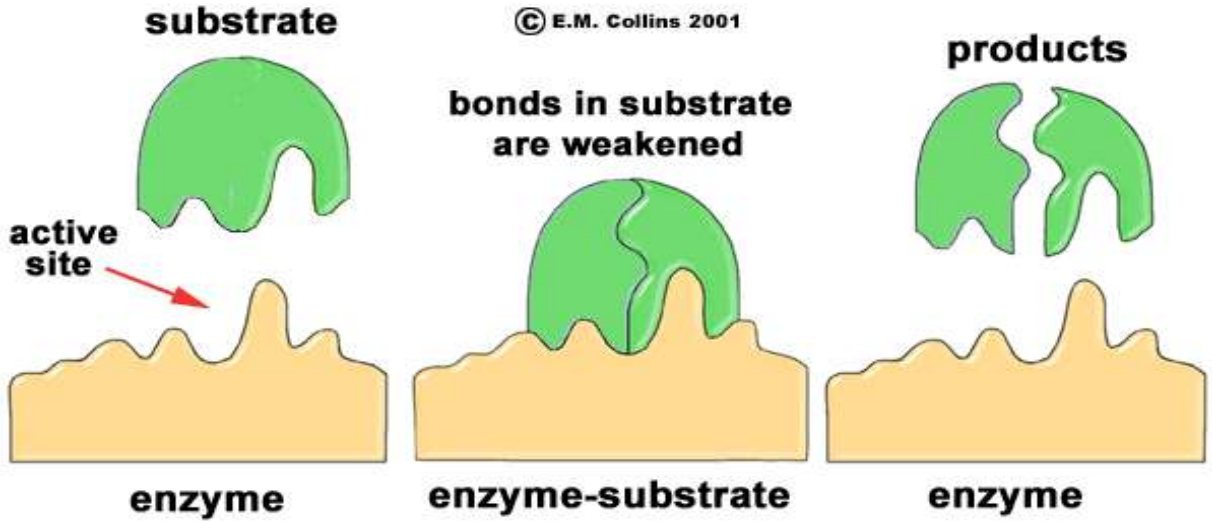
Obj. TSW identify the macromolecules living things are made of and describe their properties. P. 44NB



1. What are the 6 main elements that make up the 4 macromolecules?
2. What is an Enzyme?
3. What three environmental factors determine the enzymes function?

Enzymes

1. CHONPS- Carbon, Hydrogen, Oxygen, Nitrogen, Phosphorus, & Sulfur.



2. Enzymes are a type of protein that **catalyze** chemical reactions. This means they **speed up** the rate of chemical reactions.

3. There are three things that impact how well an enzyme will work:

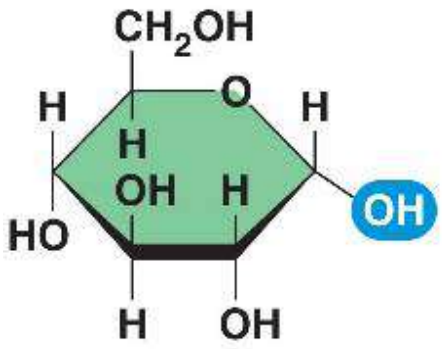
- pH
- Temperature
- Amount of Substrate &/or the amount of Enzyme

Build a Monosaccharide!

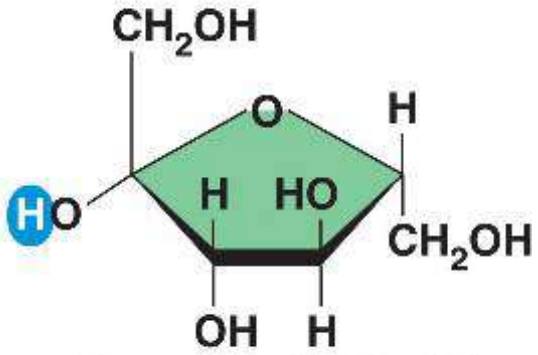
Show me a correct monosaccharide for extra credit!

Some Helpful Hints:

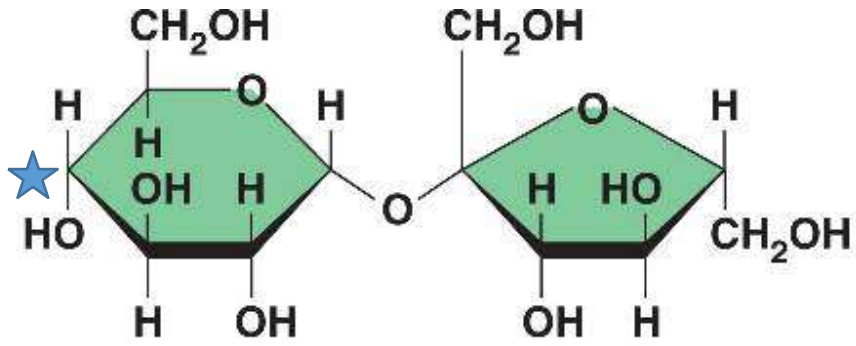
- **Black** atoms are **Carbon** (**C**).
  - Carbon always needs to be bonded to 4 other atoms.
- White atoms are Hydrogen (H).
  - Hydrogen only bonds to 1 atom.
- Red atoms are Oxygen (O)
  - Oxygen bonds to 2 atoms.
- Every unidentified **corner** is a **Carbon** atom.
  - For example, look at the ★ which identifies the corner on Sucrose. That is a carbon atom.



Glucose ($C_6H_{12}O_6$)



Fructose ($C_6H_{12}O_6$)

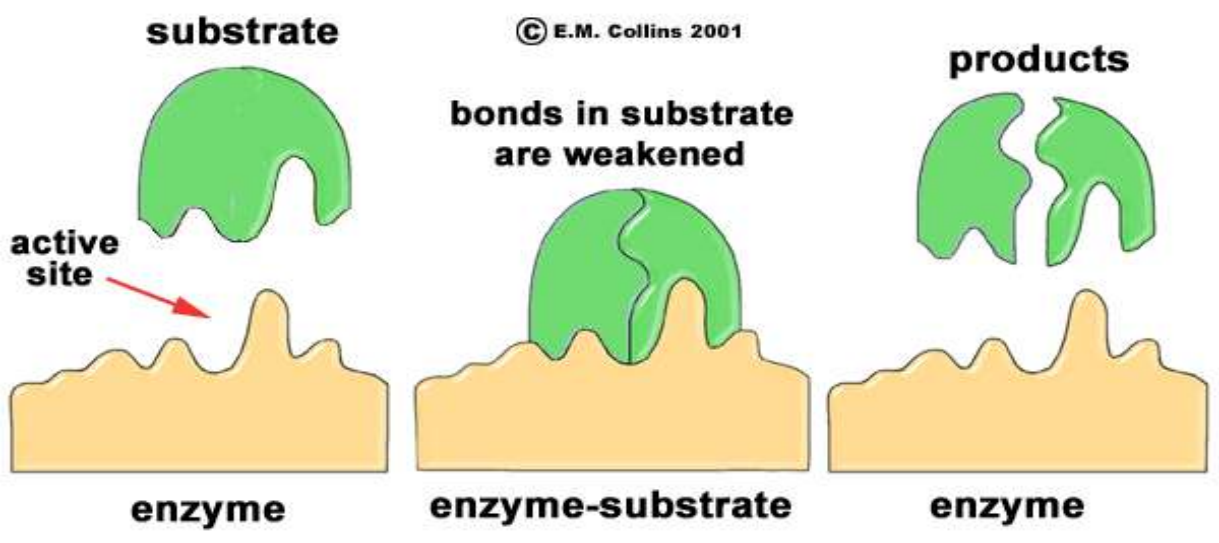


Sucrose ($C_{12}H_{22}O_{11}$)

02/19 Enzymes CH 6.3

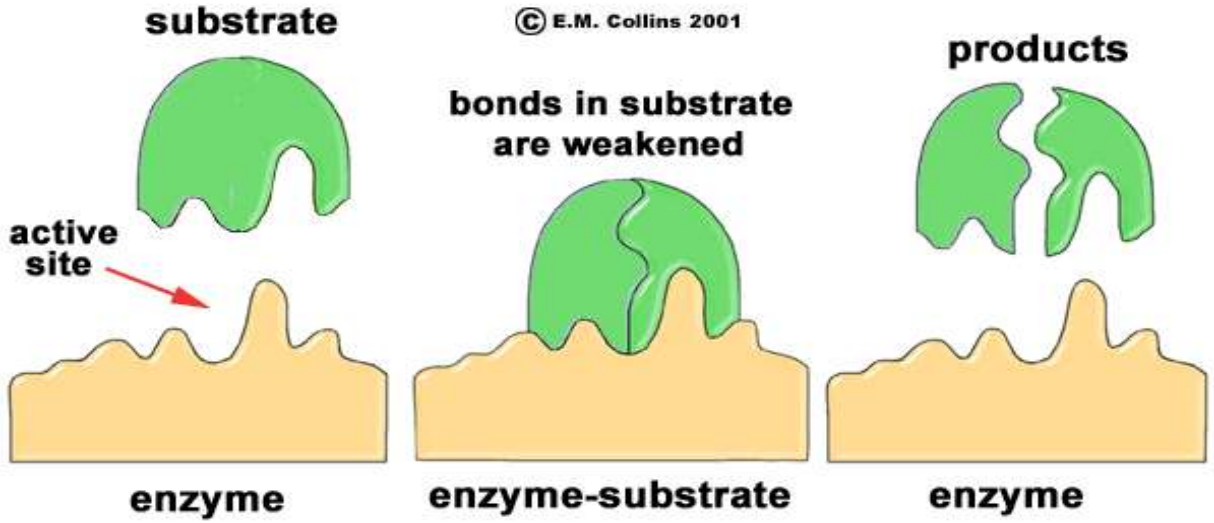
Obj. TSW learn how enzymes function and the environmental factors that influence them in and activity/ lab. P. 46NB

1. What type of macromolecule is an enzyme?
2. What is the purpose of an enzyme?
3. Name 3 environmental factors that influence an enzymes function.



Macromolecules & Subunits Notes p. 45NB

Draw this

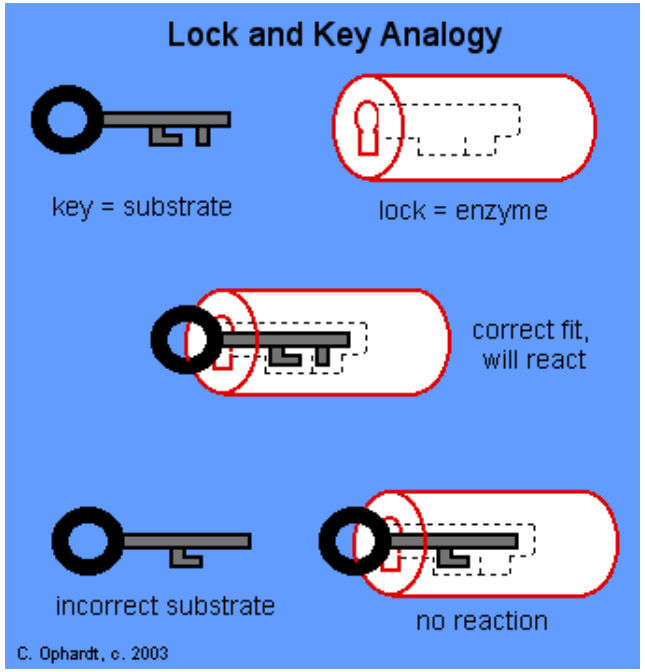


Write down these notes below.

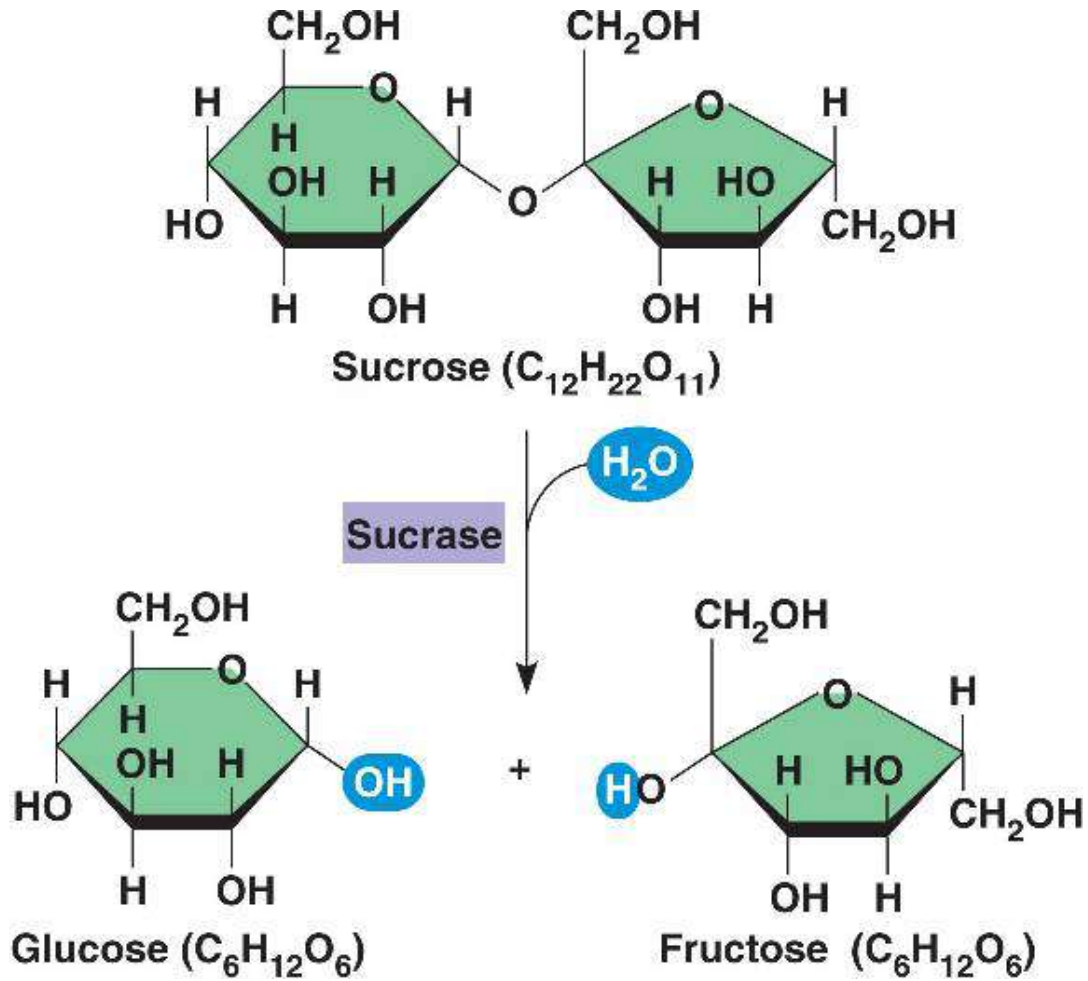
- **Lipid** – Fatty Acids
- **Carbohydrate**- Saccharides
- **Protein**(Enzymes)– Amino Acids
  - Temperature
  - pH
  - [Substrate] & [Enzymes]
  - [Salt]

***[ ] means concentration, or amount.

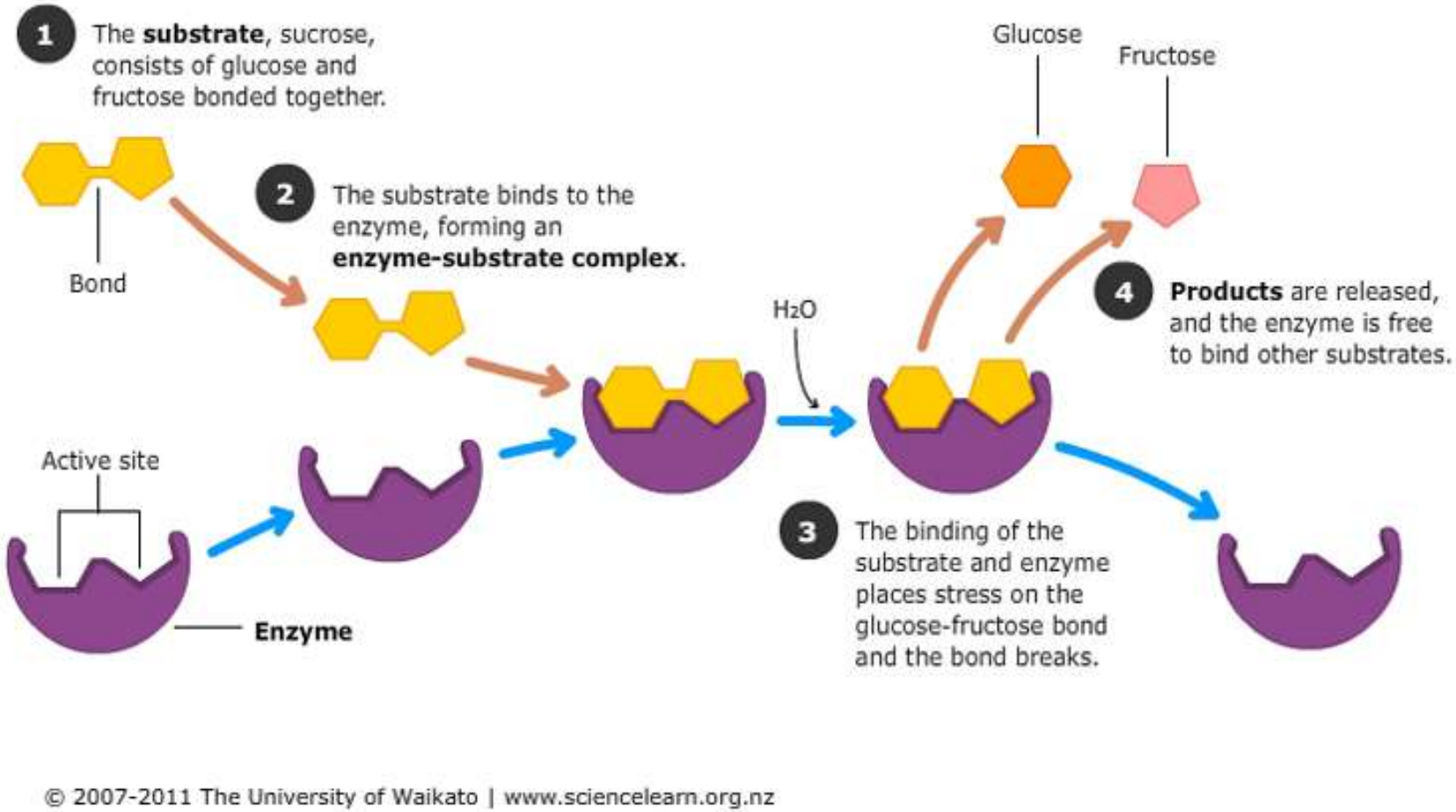
- **Nucleic Acid** - Nucleotides



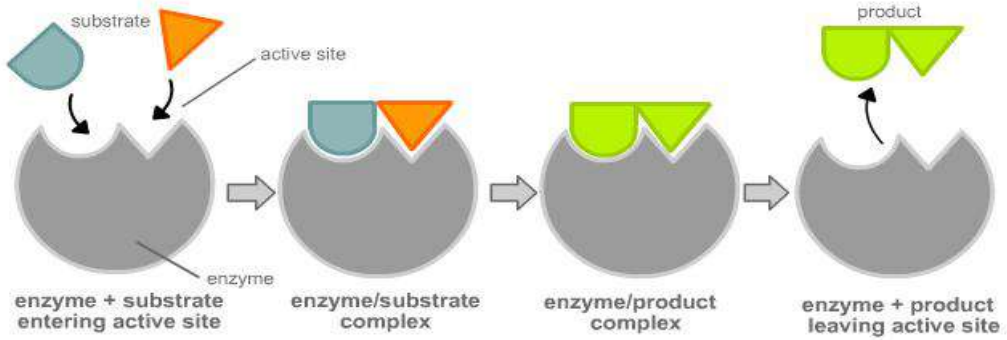
Enzymatic Reaction of Sucrase on Sucrose



Enzymatic Reaction of Sucrase on Sucrose



Enzyme Activity



- You will be given a substrate or a part of an enzyme.
- Find the matching part, that fits your active site.
- Bring your matching Enzyme/ Substrate combinations (Lock & Key) to McAllister
- I will quiz you on your knowledge of monomers and polymers in endergonic & exergonic reactions.

Catalase Lab

ml H2O2	Person 1	Person 2	Person 3	Person 4	Person 5
5	100				
6					
7		120			
8			120		
9				170	
10					140

Catalase Lab P. 27

- 1 flask / 2 people
- GLX
- Pressure Probe
- Yeast – 1 tsp.
- Hydrogen Peroxide 5ml
- Swirl
- Make observations.
- Write a summary paragraph about the function of enzymes with a picture of a substrate & enzyme & active site. What factors allow for the enzyme to function? What volume of H2O2 did Catalase work the best? Why does the enzyme speed up chemical reactions? Enzymes can be used again & again (Catalytic), how is this important in chemical reactions? At what volumes (ml) did the Catalase work the best? Write the chemical equation.

AXES Paragraph – Catalase Lab

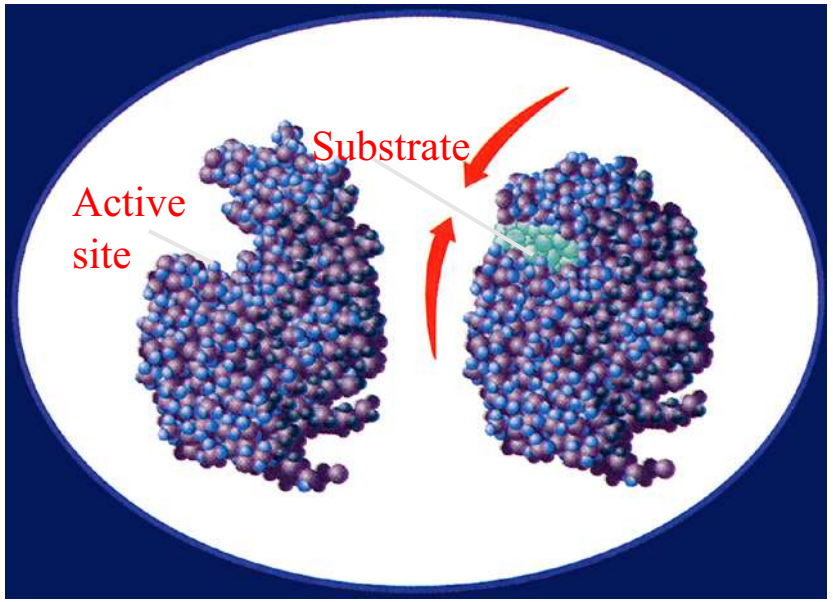
- Assertion — What is Exothermic Reactions? Use vocabulary.
- eXample — Discuss an example of an enzyme. Include details from the lab.
- Explanation — Describe the function of the enzyme, and factors that influence it.
- Significance — Why are enzymes important for us?

Question 5

Describe an enzyme and its function.

Section Check

An enzyme is a protein that enables other molecules to undergo chemical changes to form new products. Enzymes increase the speed of reactions that would otherwise proceed too slowly.



Macromolecules

Protein	Lipids	Carbohydrates	Nucleic Acids