Properties of water

* + High heat capacity
    - Absorbs/releases large amounts of heat before changing temperature
  + High heat of vaporization
    - changing from a liquid to a gas requires large amounts of heat
    - Keeps body from overheating
  + Polar solvent properties
    - dissolves ionic substances
    - serves as the body’s major transport medium
  + Reactivity
    - hydrolysis and dehydration synthesis
  + Cushioning
    - resilient cushion around certain body organs

pH Scale (0-14)

* Acids (0-6.9) vs. bases (7.1-14)
* Neutral (7) ex: Pure water (distilled water)
  + equal H+ and OH– concentrations
* Water breaks up (dissociates) equal number of hydrogen (H) and hydroxide (OH) ions
* Acid solutions
  + release H
  + ex: Tomato juice, coffee, vinegar
  + Sour taste
* Basic solutions (also called Alkaline)
  + release OH and gain H
  + ex: Antacids (MOM, Rolaids, baking soda, etc.), ammonia, soap, cleaners, detergents
  + Bitter taste, slippery feel when wet
* Buffer

Systems that resist abrupt and large swings in the pH of body fluids

Compounds

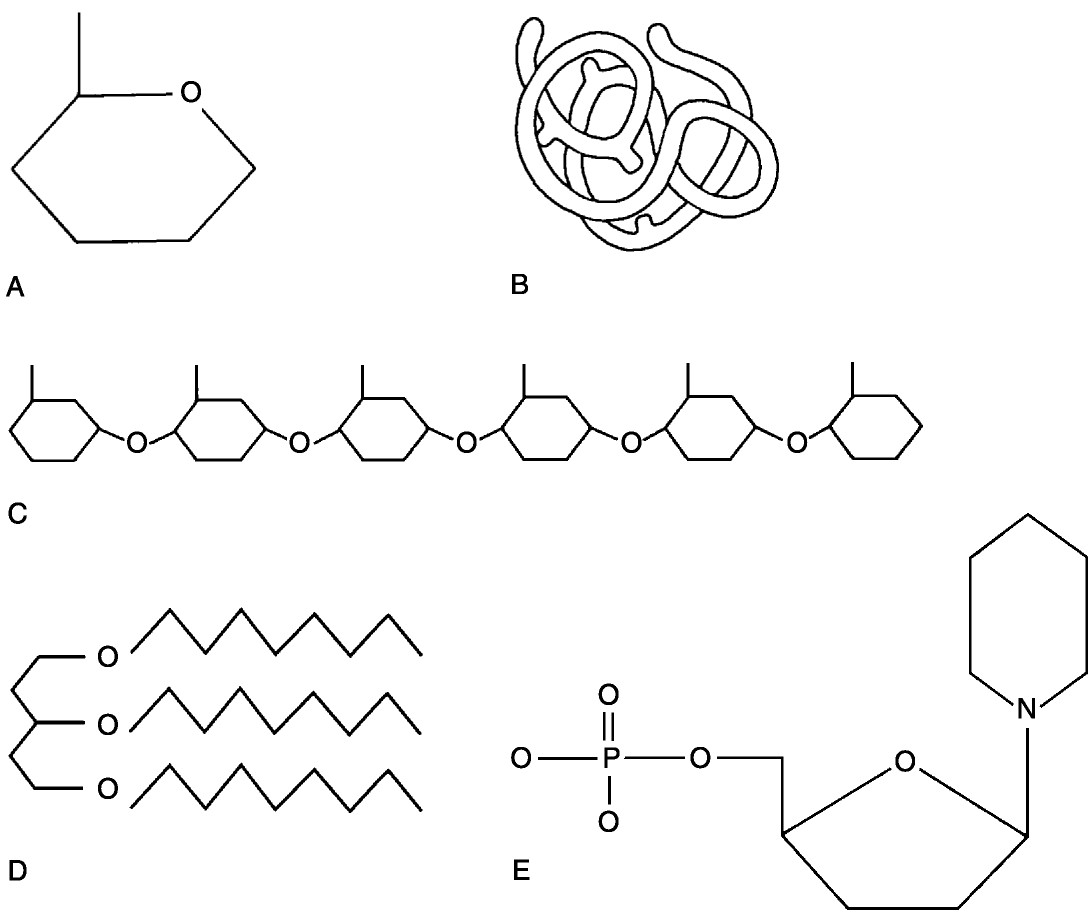
* Organic compounds
  + Contain carbon, are covalently bonded, and are often large

C6H12O6

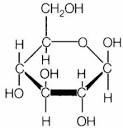
* Inorganic compounds
  + Do not contain carbon
  + H2O
  + NaCl

Carbon-Based Molecules

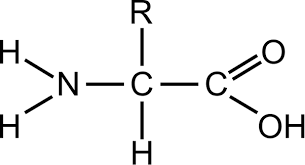
* Be able to identify the macromolecule illustrated in each diagram below. Use the list to match each one.
* Monosaccharide
* Nucleotide
* Polysaccharide
* Glycerol and 3 fatty acids (Triglyceride)
* Protein (functional)



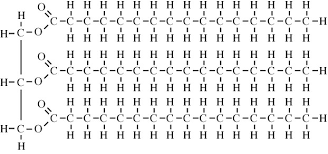
* Be able to identify the name and function of the molecular structure illustrated in the diagram below.



* Be able to identify the name and function of the molecular structure illustrated in the diagram below.



* Be able to identify the name and function of the molecular structure illustrated in the diagram below.



* Be able to identify the labeled structures in the helical structure of *deoxyribonucleic acid (DNA):*



Be able to compare the nucleic acids, DNA and RNA.

DNA

Double-stranded

Deoxyribose sugar

Bases: Adenine: Thymine

Guanine: Cytosine

RNA

Single-stranded

Ribose sugar

Bases: Adenine: Uracil

Guanine: Cytosine

Review vocabulary

1. Homeostasis
2. Catalyst
3. Disaccharide (i.e. sucrose, lactose, maltose)
4. Denature (as it relates to enzymes)
5. Monomer
6. Polymer
7. Polypeptide
8. Triglyceride (3 fatty acids bonded to 1 glycerol)
9. Fatty acids
10. Emulsify (emulsifiers)
11. Steroids
12. Synthesis reaction
13. Decomposition reaction
14. Exchange reaction
15. Exchange reaction
16. Starch (stored polysaccharide in plants)
17. Glycogen (stored polysaccharide in animals)
18. Neutral
19. Alkaline (basic/base)
20. Acidic
21. Polysaccharide
22. Peptide bonds

Study to Know:

1. Difference between **synthesis** and **decomposition** reactions.
2. The role of carbohydrates (energy and surface antigens in cell to cell recognition)
3. The four (4) elements that make up 96% of the human body.
4. The function of lipids in the human body.
   * 1. Nonpolar lipids can be broken down by EMULSIFIERS
     2. Cushioning
5. The role of hydrolysis in breaking disaccharides into monosaccharides.
6. The function of proteins in the human body
   * 1. (i.e. keratin forms part of hair and nails, hemoglobin transports oxygen in the blood; antibodies participate in immune response; actin aids muscle cell contraction)
7. The characteristics of enzymes:

Biological catalysts.

Proteins

Lower activation energy

Denatured by heat; rendered non-functional

Usually ends in -ase (i.e. lactase breaks down lactose)