SBI4U

BIOLOGICALLY IMPORTANT MOLECULES (version 2)

(Text: Nelson 12, pp. 27-54)

The 4 principal types of biologically important molecules are: _____, _____, _____, and _____

CARBOHYDRATES

- consist of the elements _____, _____, _____

Monosaccharides

- Greek for _____ sugars
- _____ shaped in solution
- classified by # of C atoms: 3 C = _____ 5 C = _____
  4 C = _____ 6 C = _____

a) *Glucose* (blood sugar) [Fig. 7, pg. 30]
   - molecular formula is _____
   - ultimate source of glucose is from _____ by process of _____
   - major _____ supply for body

Filmstrip: Draw Ring Form For Glucose Draw Ring Form For Fructose Draw Ring Form For Galactose

b) *Fructose* [Fig. 8, pg. 31]
   - same molecular formula as glucose but different structural formula; thus it is an _____ of glucose
   - in fruits and honey, etc.
   - also called _____ sugar

c) *Galactose*
   - also called _____ sugar
   - also an _____ or glucose

Disaccharides

- _____ sugars
- yield _____ monosaccharides during _____ rxn
- formed by _____ rxn

eg. _____ + _____ ----> maltose
_____ + _____ ----> sucrose
_____ + _____ ----> lactose

Filmstrip: Draw Condensation/Dehydration Synthesis Rxn To Produce Sucrose

Polysaccharides

- Greek for _____ sugars; in chains
- function as _____ form for glucose (_____ in plants, _____ in animals) and _____ materials (_____ in plants, _____ in arthropods and fungi)

Q. How does the structure of cellulose differ from that of starch and glycogen? [Fig. 10-11, pg. 32]

Q. How does the structure of chitin differ from that of starch and glycogen? [Fig. 13, pg. 34]

Filmstrip: Draw Part Of Starch Molecule

LIPIDS

- _____ in water due to few _____ (or polar) regions

Fats, Oils and Waxes

- produced by _____ rxns between a molecule of _____ and 3 _____ _____ [Fig. 16-17-18-19, pp. 35-37]
- used as _____ source of energy
- fats are _____ at room temp.; oils are _____
- _____ fatty acids have a full complement of H atoms whereas _____ fatty acids are lacking some H atoms and contain one or more _____ bonds between C atoms [Fig. 17, pg. 36]
- unsaturated fatty acids have “kinks” in their tails due to double bonds; the more unsaturated the fatty acid, the more liquid the fat is
- simple fats with 3 fatty acids are called ____glycerides

Text: Draw Production of Triacylglyceride (Fat) [Fig. 19, pg. 37]

Phospholipids

- major building block of _____ _____
- contain a _____ backbone and _____ fatty acid tails; the other tail is replaced by a nitrogen-containing group bonded to a _____ group
- polar phoshpate head group (_____) and non-polar lipid tails (_____)

Text: Draw Phospholipid [Fig. 20(c), pg. 38]

Steroids

- composed of 4 _____ _____ with protruding functional groups
- synthesized from _____
- function as _____, etc.

PROTEINS

- composed of _____ _____ subunits
- posses 2 functional groups: _____, _____

Text: Draw Generalized Amino Acid [Fig. 28, pg. 41] Filmstrip: Draw Generalized Amino Acid

- there are _____ different amino acids found in living things [Fig. 29, pp. 42-43]
- _____ group differs among amino acids and gives each distinctive properties
- a special covalent bond (called a _____ bond or _____ linkage) joins amino acids
- 2 aa's = _____, 3 aa's = _____, many aa's = _____

Filmstrip: Draw Condensation/Dehydration Synthesis Rxn To Produce Dipeptide

- some roles of proteins in the body are:

Protein Structure

a) primary -

b) secondary -

c) tertiary -

d) quaternary -

NUCLEIC ACIDS

- make notes on Fig. 42, pg. 53 including: *nucleotide, deoxyribose, ribose, phosphate group, nitrogenous base, phosphodiester linkage, complementary bases, pyrimidines (C, T), purines (A, G), hydrogen bonds*