

## Biochemistry Review

Which of the 4 classes of biochemicals applies to the following? (Carbohydrates – Lipids – Proteins – Nucleic Acids)

1. Waxes
2. Chitin
3. Forms the major structural components in animals
4. Forms the cell membrane structure
5. Fats and oils
6. Molecules that are easily 'burned' for energy
7. Enzymes
8. Used for waterproofing
9. Sex hormones
10. Forms a structural component of plants
11. Not soluble in water
12. Cortisone
13. Contouring and padding of the body
14. The major source of cellular energy
15. Polymers are formed from monosaccharide monomers
16. Glucose
17. Testosterone
18. Glycogen
19. Polymers are formed from nucleotide monomers
20. Subunits are called amino acids
21. Formed from 1 glycerol and 3 fatty acid residues
22. Govern all chemical processes of life
23. Formed from subunits of alcohol and fatty acids
24. Provides insulation in animals
25. Can produce 9 Kcal/gram of energy
26. Can produce 4 Kcal/gram of energy
27. Contain C, H, O, N
28. Contain C, H, O, and very little O
29. Composed of 4 interconnected rings
30. Contain C, H, O, N, and P
31. Polymers made from condensation/dehydration reactions
32. Structure includes a unique set of substructures
33. Stored as starch in plants
34. Forms the wall of Fungi and the exoskeletons of arthropods
35. Held together by glycoside bonds
36. Held together by peptide bonds
37. Involved in storage, transmission, and expression of genetic material
38. Major structure and functional components of life

Which class of LIPIDS does each of the following refer to? (Triglycerides – Waxes – Phospholipids – Steroids)

1. An example is cholesterol which can make many other forms of its kind
2. Fats and oils
3. Major component of the cell membrane of all life forms
4. A major set of regulatory biochemicals
5. Composed of 1 glycerol, 2 fatty acid residues and 1 phosphate molecule
6. Composed of an alcohol and long chain fatty acids
7. Can be saturated or unsaturated
8. Used in lubrication and insulation
9. Used as a fluid barrier to form cells and organelles
10. Include progesterone, testosterone, and estrogen
11. Used for waterproofing
12. Forms the cuticle in plants

Which class of CARBOHYDRATES does each of the following refer to? (maltose – sucrose – chitin – lactose – starch - glycogen – galactose)

1. A disaccharide that can be used to sweeten some dairy products (ice cream, etc)
2. Often causes tummy upsets and unpleasant farts to those who cannot digest it
3. Energy stored by animals in the liver and muscles
4. Major component of the cell walls of plants
5. Table sugar
6. Fruit sugar
7. Energy storage compound of plants
8. Found in the exoskeletons of arthropods and cell walls of fungi
9. A monomer that's found in milk
10. Glucose + Glucose
11. Glucose + Fructose
12. Glucose + Galactose
13. Milk sugar

Which protein substructure does each of the following refer to?

1. The order of amino acids as directed by DNA
2. Two or more polypeptide chains coming together for a single function
3. The coiling of the secondary chain and bonding of R-groups along the coil
4. The zigs and zags, twists and kinks of the linked amino acids
5. Hemoglobin is an example of this structure

More proteins...

1. Can you draw an amino acid? Can you draw two of them and show the byproducts?
2. What are the two important functions of proteins?

Nucleic Acids:

1. What are the two types? What are the differences?
2. What are the monomers of DNA and RNA? What are the 5 types?

Keep thinking...

1. What's the difference between saturated and unsaturated fats? Which is worse? How do they appear different at room temp?
2. Why are phospholipids the perfect cell membrane material? Which end is polar/nonpolar/hydrophilic/hydrophobic?

Identify the following:

