CARBOHYDRATES

- contain carbon, hydrogen and oxygen

- SUGARS

- monosaccharides:
  - glucose - $C_6H_{12}O_6$
  - small, soluble and sweet
- disaccharides:
  - sucrose and maltose
  - soluble and sweet

- POLYSACCHARIDES

- contain thousands of sugar molecules and is very large
  - cellulose and starch
  - glycogen in animals
  - insoluble and not sweet

Functions of carbohydrates

→ production of energy
→ needed for life processes
→ cellulose makes fibres which form cell walls

Biological molecules

Test for carbohydrates

BENEDICT'S TEST

- add benedict's solution
- if the food has a reducing sugar, it turns brick-red, or else, it remains blue.

FATS

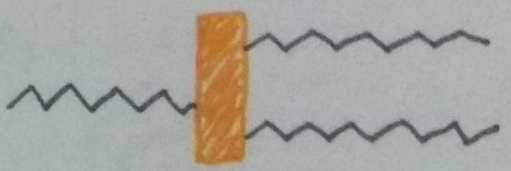
- also known as lipids
- contain carbon, oxygen and hydrogen
- insoluble in water

- Functions -
  - release energy
  - insulates the body
  - in plants, oils provide energy for germination.

- Testing -

ETHANOL EMULSION TEST

- shake chopped up food with ethanol.
- pour ethanol into water
- if fat is present



fat molecule

PROTEINS

- contain carbon, hydrogen, oxygen, nitrogen and small amounts of sulfur
- made of amino acids

– functions:
  - used for making new cells.
  - cell membranes and cytoplasm contain a lot of protein.
  - needed for growth and for repairing damaged parts of the body.

– testing:

BIURET TEST

- mix the food in water and add dilute $CuSO_4$.
- Then, add dilute KOH.
- If protein is present, the solution turns purple, otherwise, it stays blue.

ENZYMES

- Enzymes are catalysts which control metabolic reactions.
- They are proteins
- They ensure that the rate of reaction is great enough to sustain life.

Types of enzymes:

carbohydrates → carbohydrases
proteins → proteases
fats (lipid) → lipases

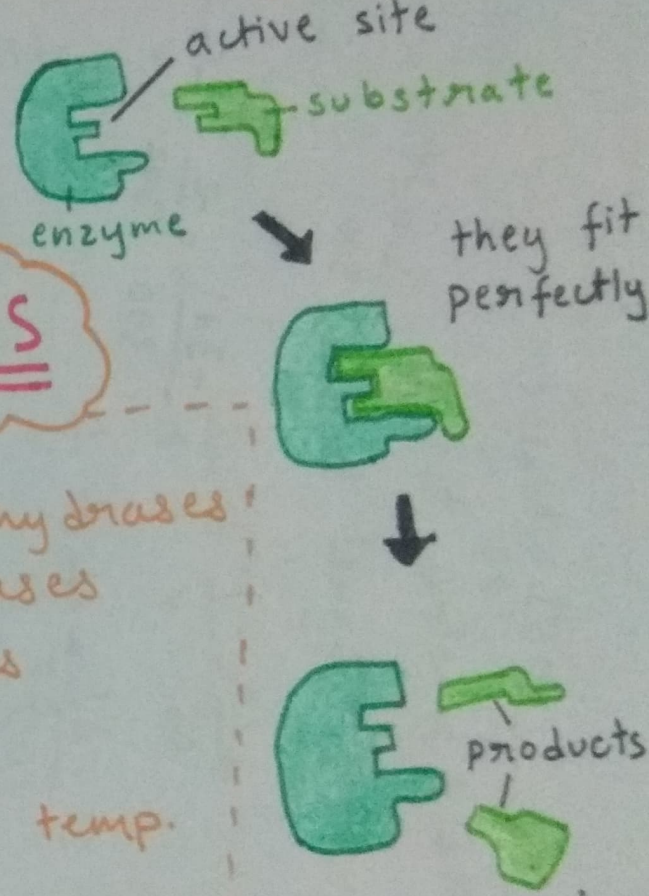
Properties:

- work best at optimum temp. and pH.
- high temperature damages them.
- They are catalysts and are specific.

How do enzymes work?

Substance present at the beginning - substrate

Substance made by the reaction - product



This process is is known as the lock and key mechanism.