

# ORGANIC COMPOUNDS



- Organic Compounds are **all** chemical compounds that have Carbon in them.  

**(*Except* for Carbonates and Carbon Dioxide.)**
- Examples:
  - CarboHydrates: sugar, starch, cellulose and glycogen.
  - Lipids: fats and oils, steroids, cholesterol.
  - Proteins: enzymes, hormones, haemoGlobins.
  - Vitamins.
  - Nucleic Acids: DeOxyRibo- (**DNA**) and Ribo- (**RNA**).
- **Organic** compounds are chemicals put together in the **organs** of living **organisms**.
  - *So Carbon is central to life!*



# CARBOHYDRATES



- Sugars, Starches, Glycogens, Celluloses.
- CarbonHydrates contain C, H and O in multiples of:  $C(H_2)O = 2$  times as many **H** as there is **O**.
- These provide the ongoing **Energy** for living organisms.
- Their Building Blocks are sugars called **Saccharides**.
- **MonoSaccharides** = 1 Sugar unit (glucose, fructose). ◆
- **DiSaccharides** = 2 Sugar units (maltose, sucrose). ◆◆
- **PolySaccharides** = at least 3 Sugar units (starch, glycogen).  
 ◆◆◆ → ◆ + ◆ + ◆
- Food is **stored** as a PolySaccharide (plant starch, or animal glycogen). It is broken down into a glucose MonoSaccharide (in Respiration) to release its energy.

# LIPIDS

Fats, Oils, Steroids, Cholesterol.



**GOOD FATS**  
**VS. BAD FATS**



- HDL-cholesterol is GOOD – For Membranes and Vitamin D.
- LDL-cholesterol is BAD – It can block blood vessels. (Got from eating too many fats.)
- Lipids are used for reserve energy, and insulation.

# How a LIPID is put together

- Lipids always have C, H, and O, with at least 3 times as much **H** as there is **O** =  $C(H_{3+})O$ 
  - They **might** contain P, to make it a *PhosphoLipid*.



- 1 Glycerol + 3 Fatty Acids  $\rightarrow$  1 Lipid + 3H<sub>2</sub>O

G

L *bond* = *bond* FATTY ACID + H<sub>2</sub>O

Y

C

E *bond* = *bond* FATTY ACID + H<sub>2</sub>O

R

O

L *bond* = *bond* FATTY ACID + H<sub>2</sub>O



# PROTEINS



- Enzymes, Hormones, Haemoglobin.
- Each *Enzyme* controls a **specific** reaction.
- *Hormones* act as chemical messengers, and travel in the blood to get processes started in different parts of your body.
- *Haemoglobin* in the blood transports our gases.
- A protein = a chain of amino acids joined together.
- Proteins are made of C, H, O, N.
- *May also have*: Fe, S, or P added to them.



# More About ENZYMES



- Just as a **certain key** can only open a **specific lock**, so does a **certain enzyme** only open a **specific reaction**. This is called the **Lock and Key** Theory.
- When conditions become too hot (extreme temperatures), or too acid (extreme pH), enzymes can lose their shape (***DeNature***). The chemicals cannot now recognise them any more in this new shape, and so they do not respond to them and do not start their reaction, and so these enzymes cannot function properly now.

***(This is fully explained on Page 4.)***



**VITAMINS**



# VITAMINS



- **VitaMins** prevent diseases. (*Vita = Life; Mins = Minerals.*)
- Vitamins B and C dissolve in water, can be urinated out, so need constant replacing.
- Vitamins A, D, and E dissolve in fats, so are stored in fats.

Vit.

	<u>Source</u>	<u>Function</u>	<u>Shortage</u>
A	Fish, egg, milk, vegetables.	Eyes. Immunity.	Infections of senses.
B	Bread, meat, milk, greens.	Brain. Heart. Muscles.	Tired Depression.
C	Fruit, vegetables, potatoes.	Resist diseases. Health.	Often ill.
D	Fish oil, eggs.	Bones. Heart. Brain.	Weak bones.
E	Cereals, greens.	Repairs damaged cells.	Poor immunity.