

Lipids

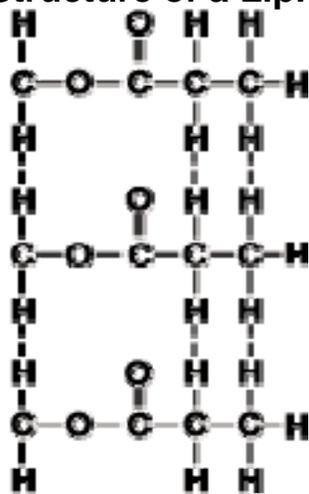
Basic Information

- ✓ The organic group of lipids is made up of **fats, oils and waxes**.
- ✓ All lipids contain the elements hydrogen, carbon, and oxygen.
- ✓ The ratio of **H:O is always GREATER than 2:1** but varies from lipid to lipid.
- ✓ The biological uses for lipids include:
 - **RESERVE ENERGY SOURCE:** a *gram of fat can provide up to 6 times* the amount of energy as one gram of carbohydrates.
 - **Lipids make up cell structures** such as cell membranes.
 - In animal cells, **lipids are used for insulation and cushioning**.

Building Blocks of Lipids

- ✓ Lipids are made up of **3 fatty acids and 1 glycerol**
- ✓ Lipids are structurally shaped like the **capital letter E** as pictured below.
- ✓ At each end of a fatty acid is a **CARBOXYL group (-COOH)**.
- ✓ **The spine of the lipid is made up of a GLYCEROL molecule** (a type of alcohol molecule)
- ✓ **Each fatty acid attaches to a hydroxyl group (-OH) on the glycerol by the process of dehydration synthesis** (bonds are formed by the removal of a water molecule).
- ✓ **One water molecule is removed for each fatty acid** attached to the glycerol.
- ✓ The bonds of the fatty acids to the glycerol molecule forms the three horizontal lines of the E.
- ✓ Since the lipid is in the shape of an E, it is **NOT** a polymer.

Structure of a Lipid



Chemical Reaction to Make a Lipid

