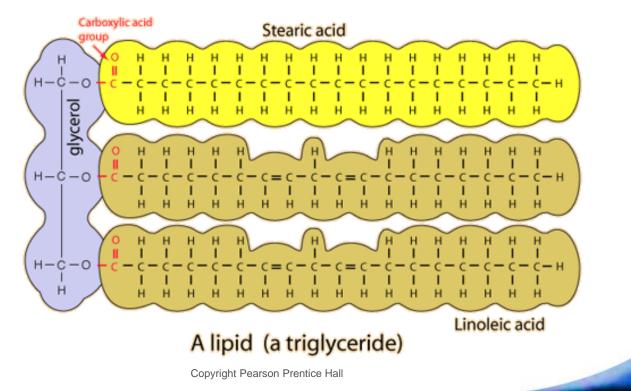
### Lipids

Lipids are generally not soluble in water.

**Lipids** are made mostly from carbon and hydrogen atoms (and a few oxygen atoms)



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#### The common categories of lipids are:

- fats
- oils
- waxes
- Steroids (like cholesterol and testosterone)
- Functions of Lipids
- Store high amounts of energy
- Important in lubricating/waterproofing and cushioning tissues
- Some are chemical messengers for body (hormones)

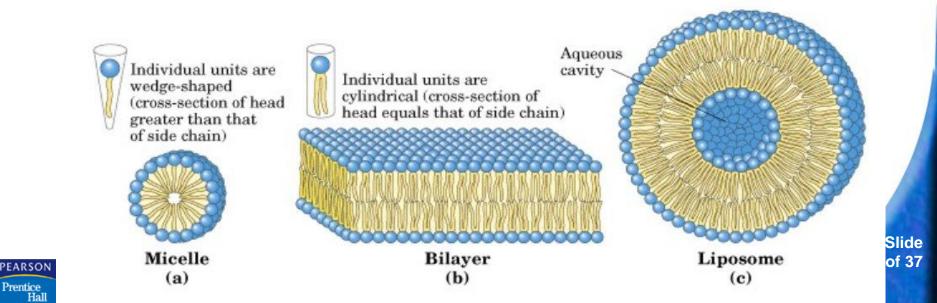
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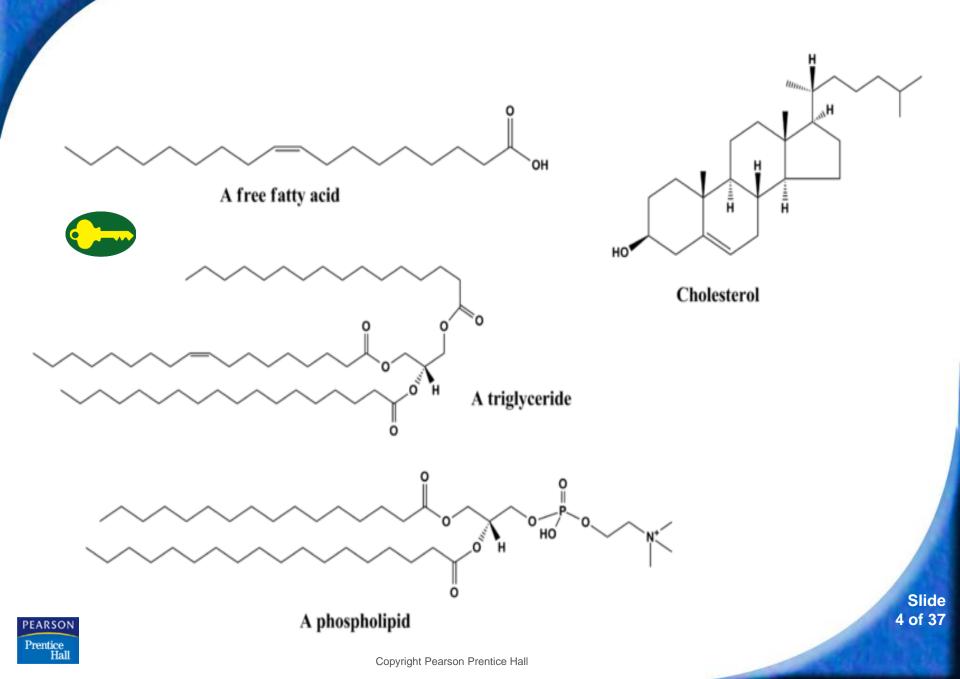
What is the function of lipids?

Lipids can be used to store energy. Some lipids are important parts of biological membranes and waterproof coverings.

# Lipid Bilayers







Many lipids are formed when a glycerol molecule combines with compounds called fatty acids.

If each carbon atom in a lipid's fatty acid chains is joined to another carbon atom by a single bond, the lipid is said to be saturated.

The term <u>saturated</u> is used because the fatty acids contain the maximum possible number Of hydrogen atoms.

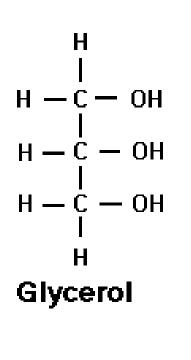
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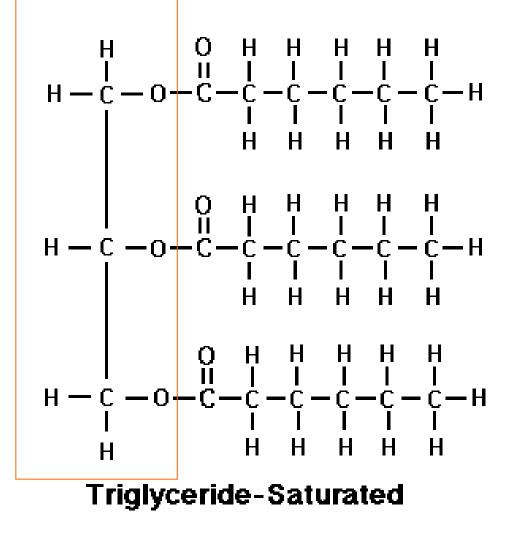
ex) Stearic Acid



\* Sat. fats tend to solidify at higher temps.

Glycerol

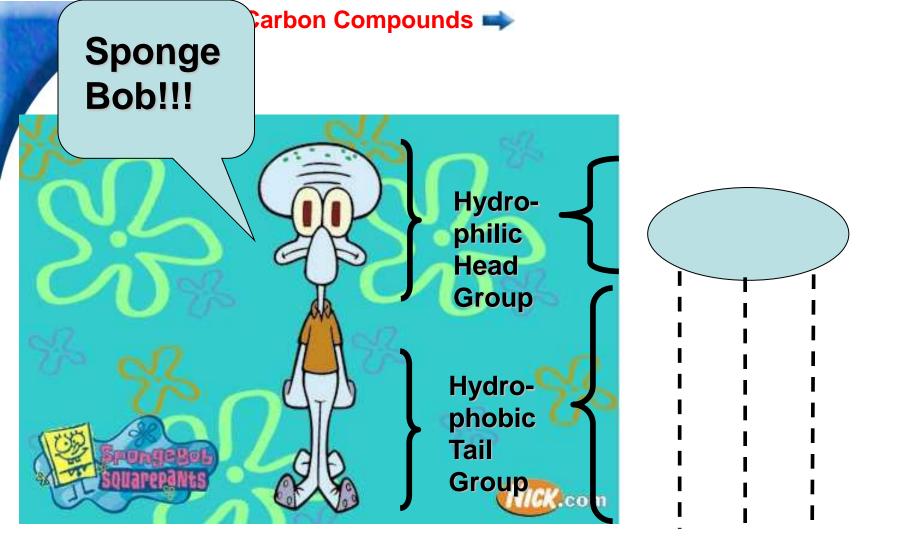






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#### Saturated fats

Saturated fats are found in animal products such as butter, cheese, whole milk, ice cream, cream, and fatty meats, and oils such as coconut, palm, and palm kernel oil

Saturated Fatty Acid (Stearic Acid)

> н-с-н H-Ċ-H H-Ć-H H-C-H H-C-H H-C-H H-C-H H-C-H H-C-H H-C-H H-C-H н-с-н H-C-H H-C-H H-C-H H-C-H H-C-H

> > он

\*ADAM

Essential Fatty Acid (Linolenic Acid)





TJ BUTTER

If there is at least one carbon-carbon double bond in a fatty acid, it is **unsaturated**.

#### ex) Palmitoleic acid

Lipids whose fatty acids contain more than one double bond are **polyunsaturated**.

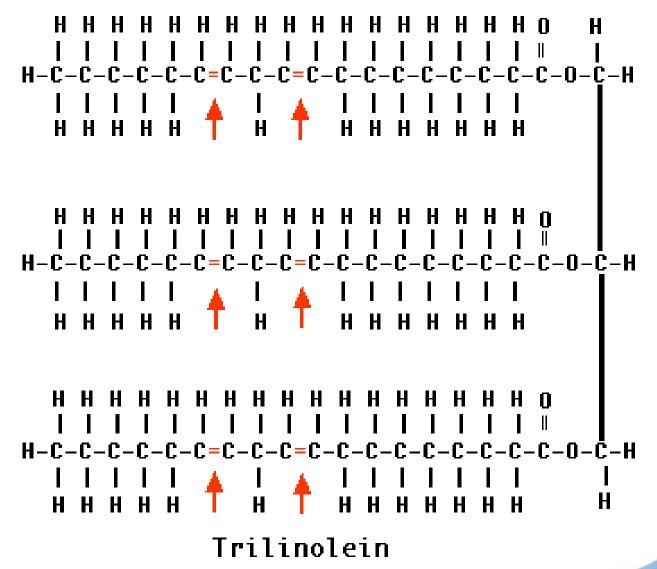
## ex) omega 3 fatty acids

Lipids that contain unsaturated fatty acids tend to be <u>liquid</u> at room temperature.



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### **Unsaturated Fats**



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Polyunsaturated fats can have a beneficial effect on your health... when eaten in moderation and when used to replace saturated fats or *trans* fats.

POLYUNSATURATED

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# **Polyunsaturated Fats**

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#### Table 1.Percentage of omega 6 &3 fatty acids in some vegetable

| Name of the oil | Omega 6 fatty acids%                  | Omega 3 fatty acids % |
|-----------------|---------------------------------------|-----------------------|
| Canola oil      | 22                                    | 10                    |
| Flaxseed oil    | 17                                    | 55                    |
| Safflower oil   | 76                                    | Trace                 |
| Sunflower oil   | 71                                    | 1                     |
| Corn oil        | 57                                    | 1                     |
| Olive oil       | 9                                     | 1                     |
| Soybean oil     | 54                                    | 8                     |
| Coconut oil     | 2                                     | 0                     |
| Peanut oil      | 33<br>Copyright Pearson Prentice Hall | Trace                 |



"Not all fat's bad. Maybe you're gaining the omega-3 polyunsaturated kind."

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### Many lipids are formed from glycerol and

A a. fatty acids.

- b. monosaccharides.
- c. amino acids.
- d. nucleic acids.



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