

Short Lesson 2: Lipids

I. Anticipatory Set – Attention getter

- Comic about omega-3 fatty acid

II. Statement of Objectives:

- ❖ State what a lipid is and list at least 2 examples of lipids.
- ❖ Differentiate between fatty acids, waxes, and steroids based on chemical structure.
- ❖ Explain the human importance of lipids.

III. Background Information:

- Review what it means to be an **organic molecule**.
 - A molecule that contains chains of carbon atoms covalently bonded together.

IV. Direct Instruction:

- A **lipid** is...
 - A **fat soluble organic molecule** that is used for multiple functions within the body, including:
 - Concentrated energy source
 - i.e. **fatty acids** & ATP
 - Structural components of cells
 - i.e. **wax** in plant cell walls, **phospholipid** bilayer of membranes
 - Building blocks in hormones
 - i.e. **steroids**
- Fatty Acids
 - Contain a **carboxylic acid group** and a **hydrocarbon chain**.
 - Serve as **energy sources** through metabolism to generate ATP!
 - Some examples of foods that contain fatty acids are...
 - Leafy greens, oils, nuts, cheese, fish, and other meats
- Waxes
 - Contain an **ester group** and **two hydrocarbon chains**.
 - Provide **protective coating** and **structure** to various cells.
 - Some examples of waxes are...
 - Water resistant coating on leaves, bee's wax to separate combs of honey, waxes in the skin of the Waxy Monkey Frog to reduce water loss
- Close up image of a leaf to demonstrate the way waxes in the leaf cause the water to bead up
- Steroids
 - Are **complex carbon ring** structures.
 - Are important in **body chemistry** and are associated with **hormones** like cholesterol, sex hormones, cortisone, and anabolic steroids.
 - Some examples of steroids are...
 - Cortisol, sex hormones, and cholesterol
- Phospholipids

- Are the components of the **lipid bilayer of the cell membrane**.
- **Regulate movement** through the membrane.
- So what's the big deal?
 - Importance of lipids in the body:
 - Source and storage of **energy**
 - Component of **membranes** surrounding cells
 - Building blocks for many **hormones**
- Diagram to visualize some of the places where lipids are found
- Review slides
 - What is a lipid?
 - fat soluble organic molecule
 - energy source
 - structural component in cells
 - building blocks in hormones
 - Name at least 2 examples of lipids.
 - Fatty acids, waxes, steroids, & phospholipids
 - Identifying different types of lipids based on chemical structure
 - Name at least 1 importance of lipids.
 - Energy source
 - Membrane component
 - Hormone building blocks

V. Guided Practice: