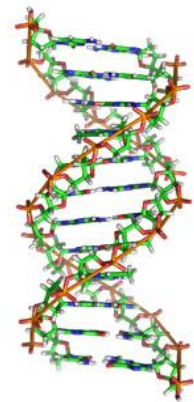


Vocabulary: Molecular Structure and Properties

- **Alkanes** – a group of simple organic compounds that consist of carbon and hydrogen bonds.
 - Examples of alkanes include methane (CH₄), ethane (C₂H₆), and propane (C₃H₈).
 - Alkanes are commonly used as fuels.
- **Autoignition temperature** – the minimum temperature required for a substance to spontaneously burn.
- **Carbohydrate** – an organic molecule containing hydrogen, carbon, and oxygen that is a major source of energy for living things.
 - Carbohydrates are produced by plants during photosynthesis.
 - Carbohydrates include simple sugars and complex starches.
 - Carbohydrates have the general chemical formula C_x(H₂O)_y.
- **Combustion** – a chemical reaction in which a fuel is burned.
 - Most examples of combustion involve the burning of a hydrocarbon in oxygen, producing water and carbon dioxide.
 - For example, methane burns in oxygen to form water and carbon dioxide:

$$\text{CH}_4 + 2\text{O}_2 \rightarrow 2\text{H}_2\text{O} + \text{CO}_2$$
- **Crystal** – a solid formed by a repeating pattern of atoms.
- **Dissociation** – the process of breaking up into smaller components.
 - When sodium chloride (NaCl) dissolves in water, it dissociates into Na⁺ and Cl⁻ ions.
- **Electrolyte** – a *solution* that conducts electricity.
 - Many electrolytes consist of an ionic compound dissolved in water or another *solvent*.
- **Enzyme** – a protein that facilitates a specific chemical reaction in an organism.
- **Hydrogen bond** – a weak bond that arises from the attraction between a covalently-bonded hydrogen atom on one molecule with an electronegative atom in another molecule.
 - Electronegative atoms are atoms that attract electrons more strongly than hydrogen, thus acquiring a partial negative charge.
 - Hydrogen bonds form between water molecules when ice is formed.

- Lipid – a fat.
 - A lipid molecule usually consists of three *fatty acids* bonded to a “backbone” of *glycerol*.
 - Lipids are used as an energy source and as a building material for cells.
 - In the presence of lipids, Sudan Red solution will show concentrated spots of color.
- Melting point – the temperature at which melting occurs.
 - At sea level, the melting point of ice is 0 °C (32 °F).
- Molecule – a stable particle made of two or more atoms held together with covalent bonds.
 - A water molecule (H₂O) is made of two hydrogen atoms and one oxygen atom.
- Nucleic acids – complex molecules that contain genetic information.
 - The most famous nucleic acids are DNA and RNA.
 - The DNA molecule has the shape of a double helix, or twisted ladder. The sides are composed of a sugar (deoxyribose) and phosphate groups. The “rungs” of the ladder are composed of pairs of nitrogenous bases.
- Polarity – separation of electrical charge in a molecule.
 - Polar molecules have one end with a positive charge and one end with a negative charge.
 - Water molecules are polar.
- Protein – a molecule composed of a chain of *amino acids*.
 - Proteins are an essential building block of muscles, skin, bone, hair, and most other body structures.
- Solute – a substance that is dissolved in another substance to form a solution.
 - In salt water, the solute is salt.
- Solution – a homogeneous mixture of two or more substances.
 - Solutions generally consist of a solute that is dissolved into a *solvent*.
 - Solvents are generally liquids.
 - Solutes can be solids, liquids, or gases.
 - Examples of solutions include salt water, sugar water, and seltzer.
- Solvent – a liquid or gas that dissolves a solute to form a solution.
 - In salt water, the solvent is water.



DNA