

Unit 1 Lecture

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Cells Are Made From a Few Types of Atoms
The Outermost Electrons Determine How Atoms Interact
Covalent Bonds Form by the Sharing of Electrons
There Are Different Types of Covalent Bonds
An Atom Often Behaves as if It Has a Fixed Radius
Water Is the Most Abundant Substance in Cells
Some Polar Molecules Are Acids and Bases
Four Types of Noncovalent Attractions Help Bring Molecules Together in Cells
A Cell Is Formed from Carbon Compounds
Cells Contain Four Major Families of Small Organic Molecules
Sugars Provide an Energy Source for Cells and Are the Subunits of Polysaccharides
Fatty Acids Are Components of Cell Membranes, as Well as a Source of Energy
Nucleotides Are the Subunits of DNA and RNA
The Chemistry of Cells Is Dominated by Macromolecules with Remarkable Properties
Noncovalent Bonds Specify Both the Precise Shape of a Macromolecule and its Binding to Other

Review Catalysis & Energy use

Cell Metabolism Is Organized by Enzymes
Biological Order Is Made Possible by the Release of Heat Energy from Cells
Photosynthetic Organisms Use Sunlight to Synthesize Organic Molecules
Cells Obtain Energy by the Oxidation of Organic Molecules
Oxidation and Reduction Involve Electron Transfers
Enzymes Lower the Barriers That Block Chemical Reactions
How Enzymes Find Their Substrates: The Enormous Rapidity of Molecular Motions
The Free-Energy Change for a Reaction Determines Whether It Can Occur

The Concentration of Reactants Influences the Free-Energy Change and a Reaction's Direction
For Sequential Reactions, ΔG° Values Are Additive
Activated Carrier Molecules Are Essential for Biosynthesis

The Formation of an Activated Carrier Is Coupled to an Energetically Favorable Reaction
ATP Is the Most Widely Used Activated Carrier Molecule
Energy Stored in ATP Is Often Harnessed to Join Two Molecules Together
NADH and NADPH Are Important Electron Carriers
There Are Many Other Activated Carrier Molecules in Cells
The Synthesis of Biological Polymers Is Driven by ATP Hydrolysis