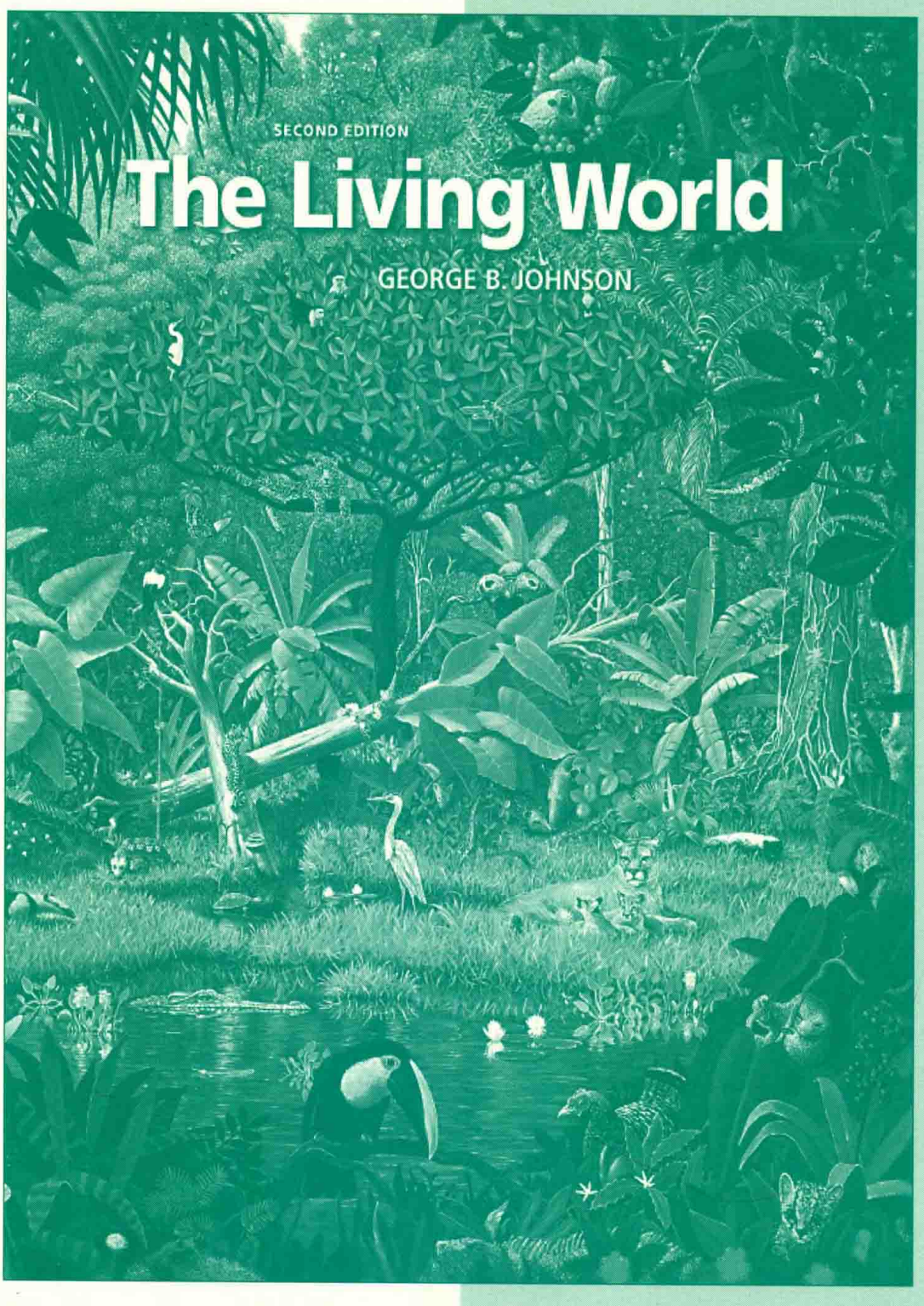
Ready Notes

to accompany



Ready Notes

to accompany

The Living World

Second Edition

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Washington University

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Table of Contents

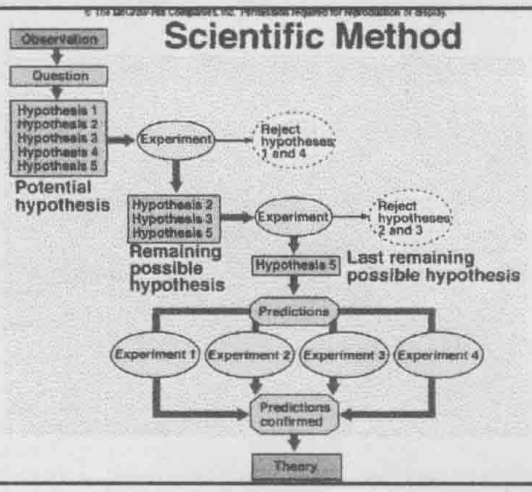
Chapter 1

The Living World

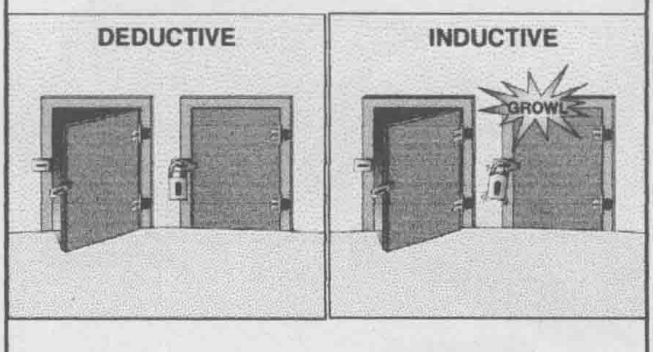
Second Edition

George B. Johnson

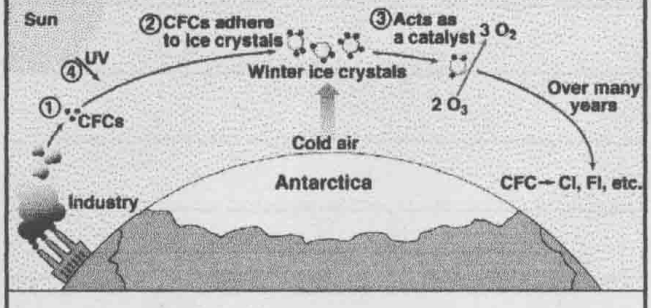
Scientific Method



Deductive and Inductive Reasoning



How CFCs Attack and Destroy Ozone



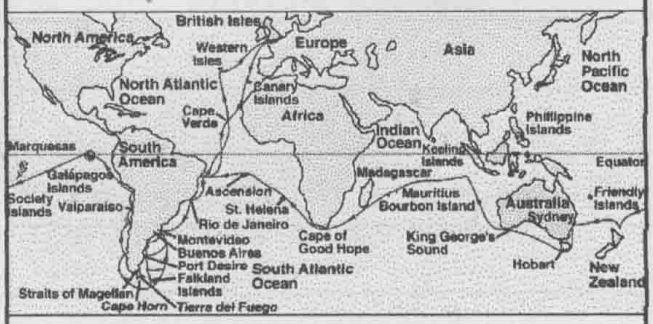
Chapter 2

The Living World

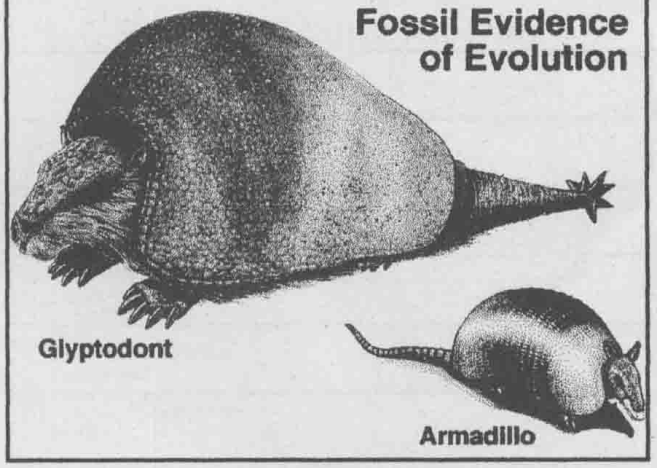
Second Edition

George B. Johnson

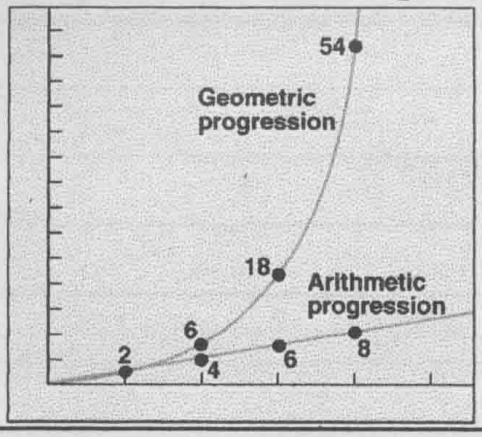
H.M.S. *Beagle* Voyage



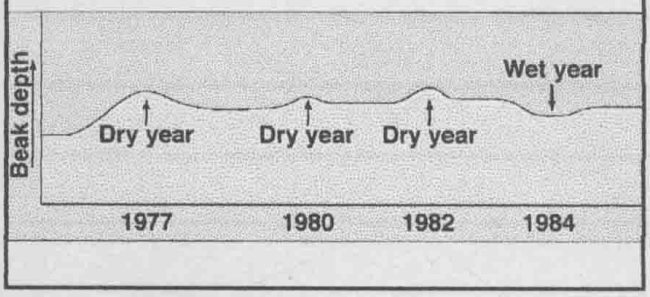
Fossil Evidence of Evolution



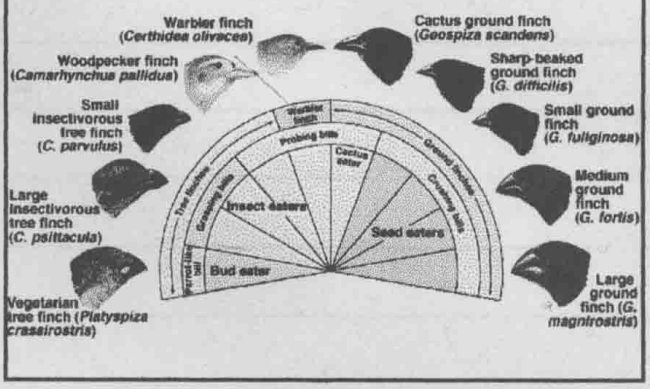
Geometric and Arithmetic Progressions



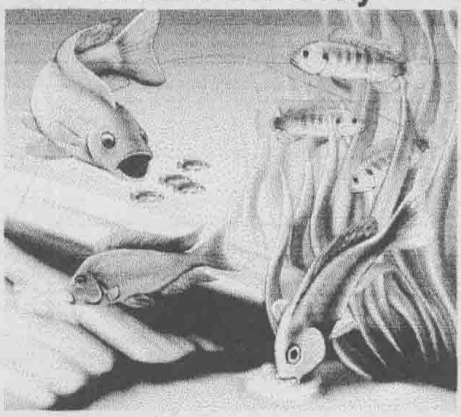
Natural Selection and Beak Size



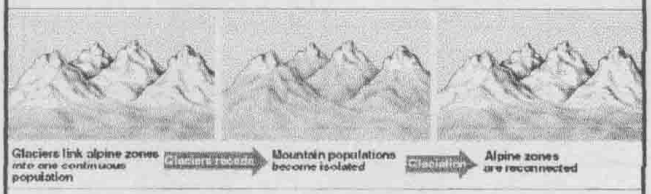
Darwin's Finches



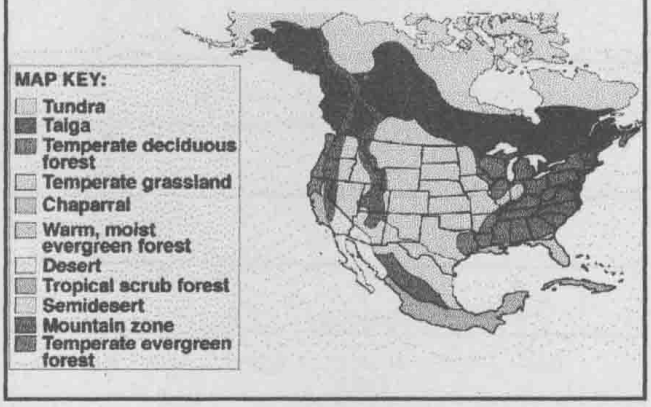
Cichlid Diversity



Periodic Isolation

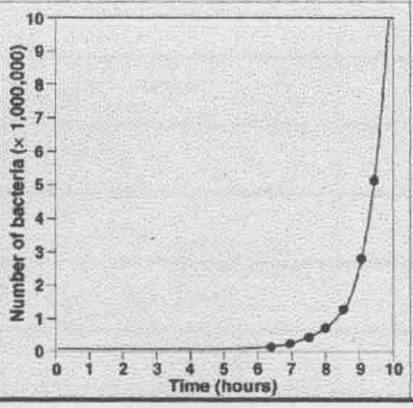


Biomes of North America

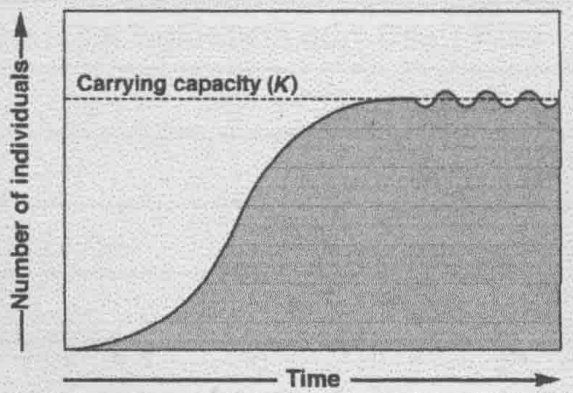


Exponential Growth in a Population of Bacteria

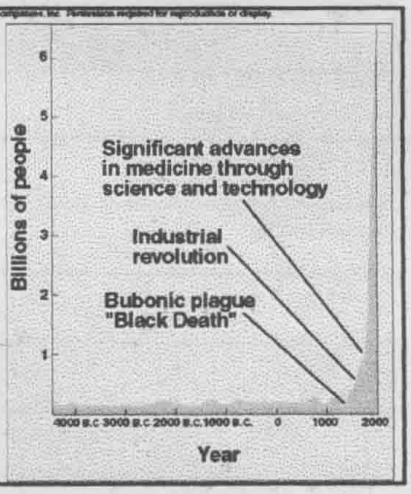
Time (hours)	Number of bacteria
10.0	1,048,576
9.5	524,288
9.0	262,144
8.5	131,072
8.0	65,536
7.5	32,768
7.0	16,384
6.5	8,192
6.0	4,096
5.5	2,048
5.0	1,024
4.5	512
4.0	256
3.5	128
3.0	64
2.5	32
2.0	16
1.5	8
1.0	4
0.5	2
0.0	1



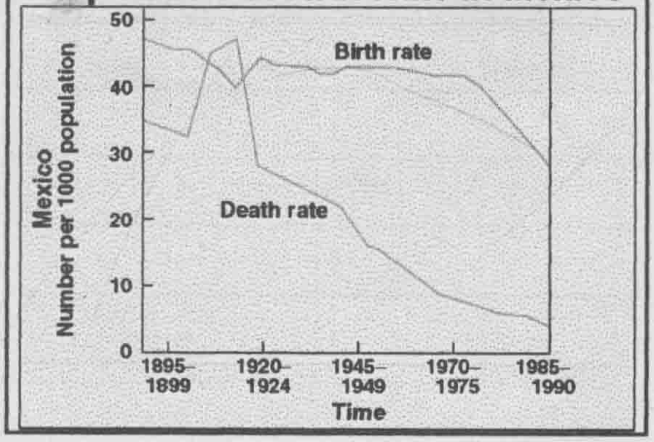
The Sigmoid Growth Curve



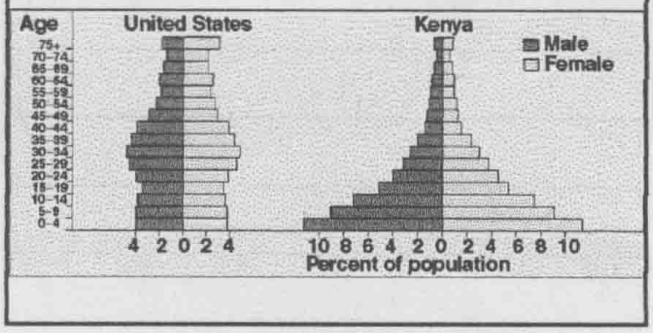
History of Human Population Size



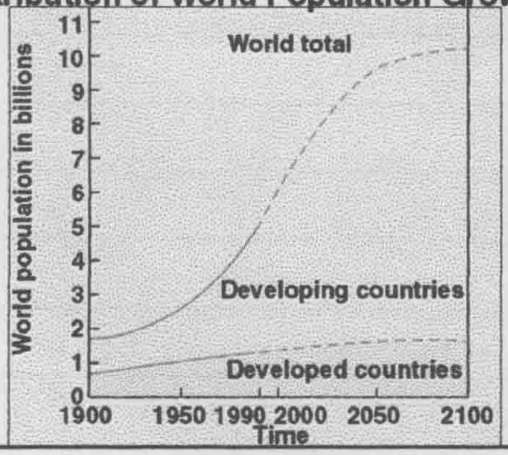
Population Growth Rate in Mexico



Population Pyramids from 1990



Distribution of World Population Growth



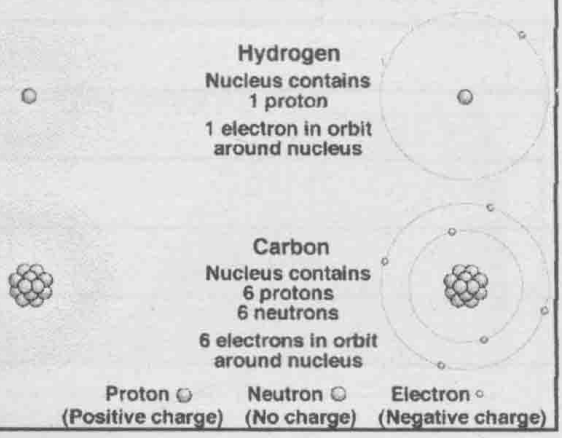
Chapter 3

The Living World

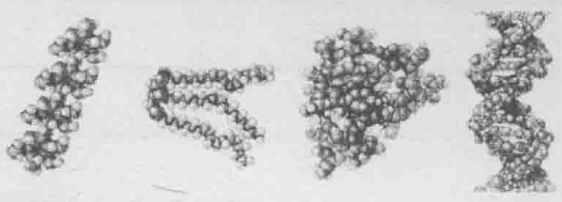
Second Edition

George B. Johnson

Basic Structure of Atoms

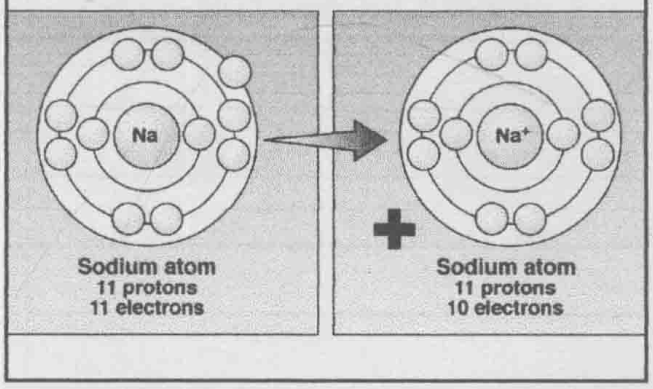


Biological Macromolecules

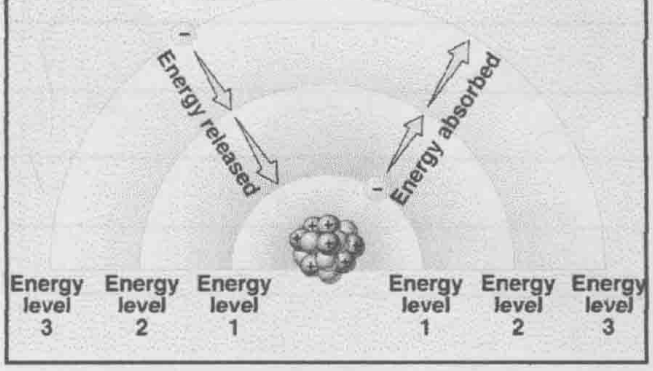


Carbohydrate (starch) | Lipid (triacylglycerol) | Protein (enzyme) | Nucleic acid (DNA)

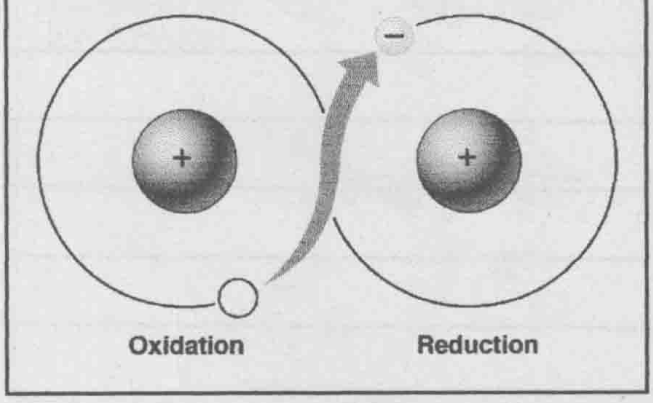
Making a Sodium Ion



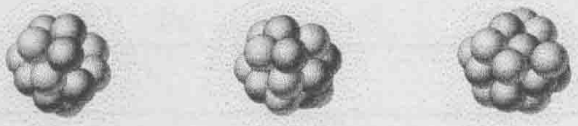
Atomic Energy Levels



Oxidation and Reduction

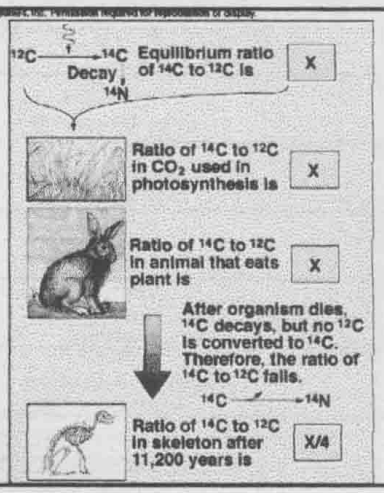


Isotopes of the Element Carbon

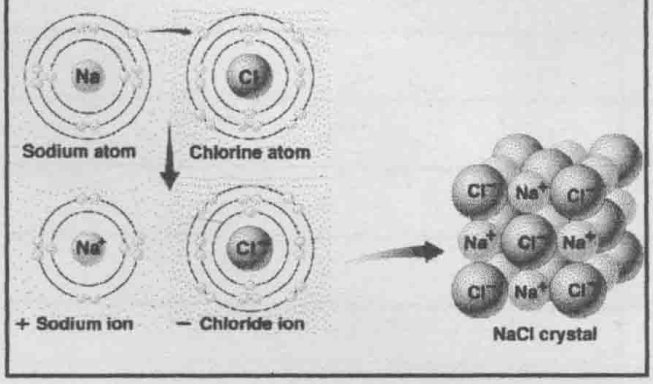


Carbon-12	Carbon-13	Carbon-14
6 protons	6 protons	6 protons
6 neutrons	7 neutrons	8 neutrons
6 electrons	6 electrons	6 electrons

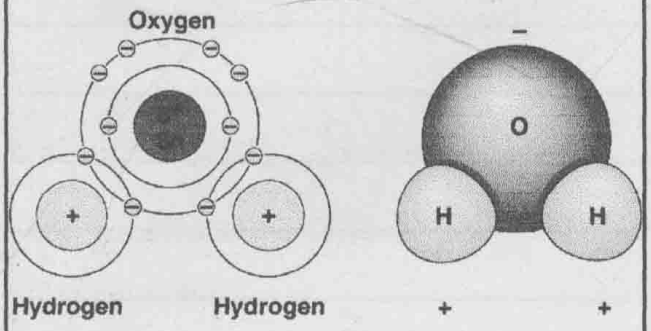
Radioactive Isotope Dating



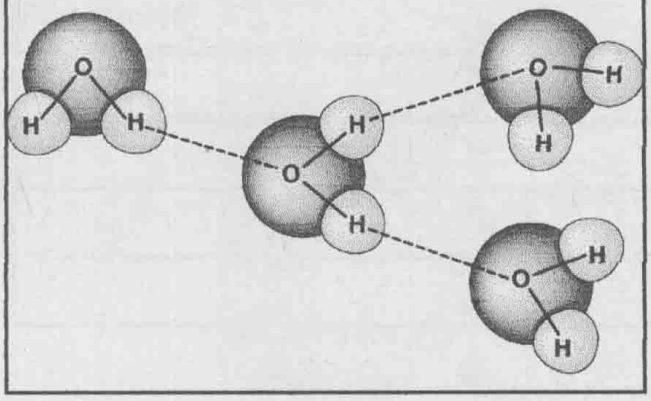
Ionic Bonds—NaCl



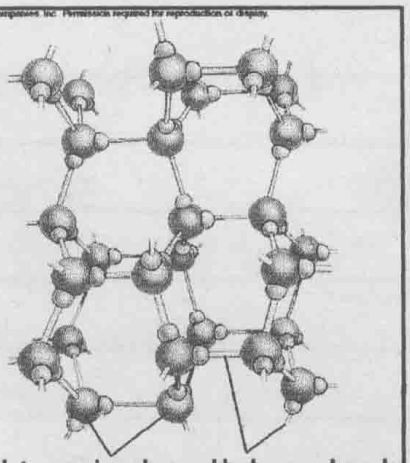
Water Molecules Contain Two Covalent Bonds

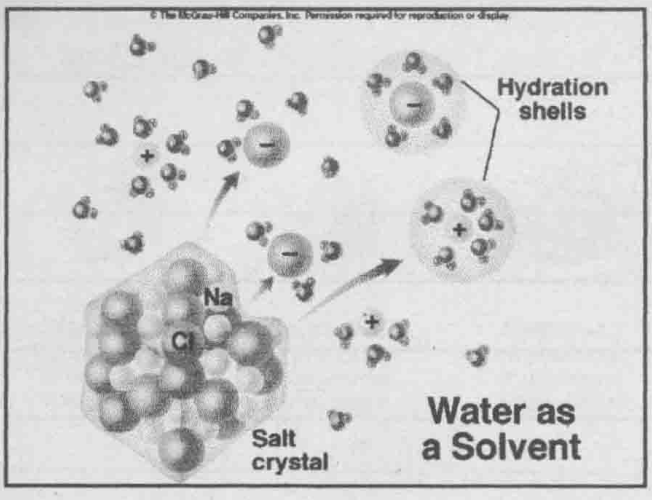


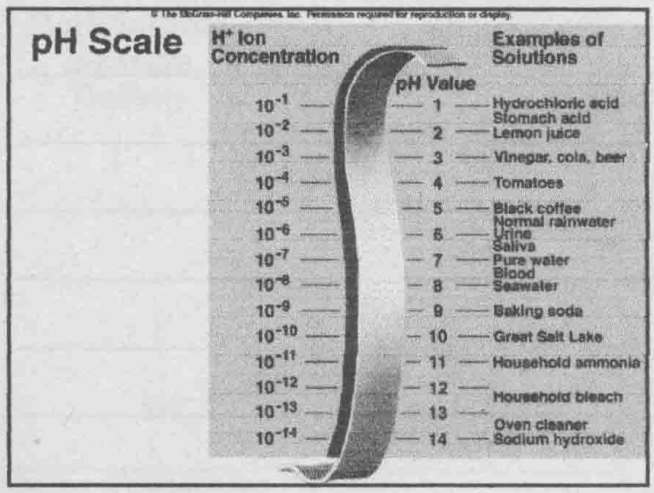
Hydrogen Bonding in Water Molecules

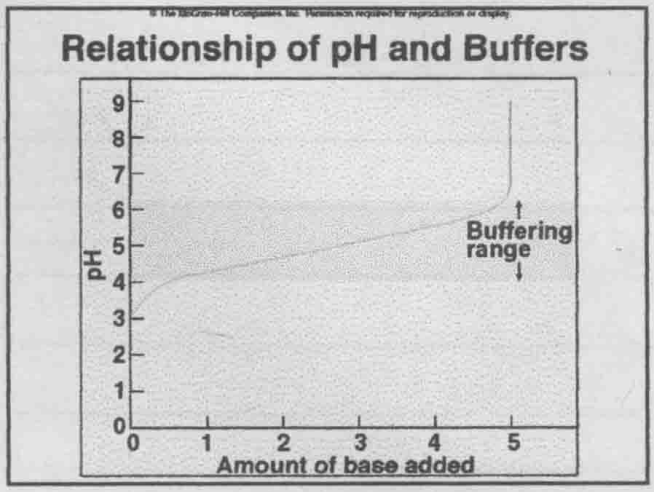


Hydrogen Bonds in an Ice Crystal

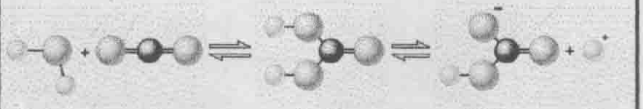



Hydration shells
Na
Cl
Salt crystal
Water as a Solvent


pH Scale
H+ Ion Concentration
pH Value
Examples of Solutions
10-1 1 Hydrochloric acid
10-2 2 Stomach acid, Lemon juice
10-3 3 Vinegar, cola, beer
10-4 4 Tomatoes
10-5 5 Black coffee
10-6 6 Normal rainwater, Urine, Saliva
10-7 7 Pure water
10-8 8 Blood, Seawater
10-9 9 Baking soda
10-10 10 Great Salt Lake
10-11 11 Household ammonia
10-12 12
10-13 13 Household bleach
10-14 14 Oven cleaner, Sodium hydroxide

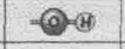
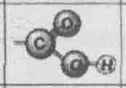
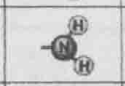
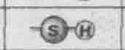
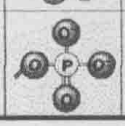

Relationship of pH and Buffers
pH
Buffering range
Amount of base added

Buffer Formation



H_2O Water | CO_2 Carbon dioxide | H_2CO_3 Carbonic acid | HCO_3^- Bicarbonate ion | H^+ Hydrogen ion

The Six Principal Functional Groups

Group	Structural Formula	Ball-and-Stick Model	Found In:
Hydroxyl	–OH		Alcohols
Carbonyl			Formaldehyde
Carboxyl			Vinegar
Amino			Ammonia
Sulfhydryl	–S–H		Rubber
Phosphate			ATP

Dehydration and Hydrolysis