

BIO107
Introduction to Biotechnology

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Science Versus Religion

Religion is based on faith in the absence of evidence.

Science is based on evidence that leads to belief.

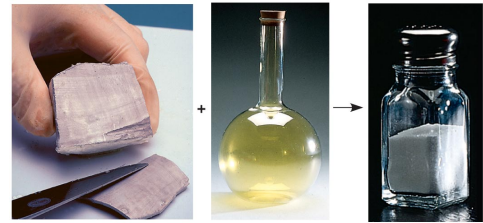
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What is Chemistry?

What is Biology?

What is Biotechnology?

3



Sodium

Chlorine

Sodium chloride

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Nucleus

Protons (+ charge)
determine element

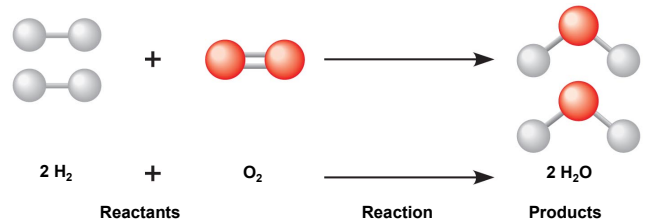
Neutrons (no charge)
determine isotope

Atom

Electrons (- charge)
form negative cloud
and determine
chemical behavior

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Table 2.1 Naturally Occurring Elements in the Human Body

Symbol	Element	Atomic Number (see p. 33)	Percentage of Human Body Weight
Elements making up about 96% of human body weight			
O	Oxygen	8	65.0
C	Carbon	6	18.5
H	Hydrogen	1	9.5
N	Nitrogen	7	3.3
Elements making up about 4% of human body weight			
Ca	Calcium	20	1.5
P	Phosphorus	15	1.0
K	Potassium	19	0.4
S	Sulfur	16	0.3
Na	Sodium	11	0.2
Cl	Chlorine	17	0.2
Mg	Magnesium	12	0.1

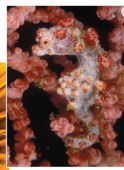
Elements making up less than 0.01% of human body weight (trace elements)

Boron (B), chromium (Cr), cobalt (Co), copper (Cu), fluorine (F), iodine (I), iron (Fe), manganese (Mn), molybdenum (Mo), selenium (Se), silicon (Si), tin (Sn), vanadium (V), zinc (Zn)

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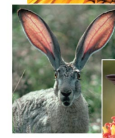
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Order



Response to the environment

Evolutionary adaptation



Regulation



Energy processing



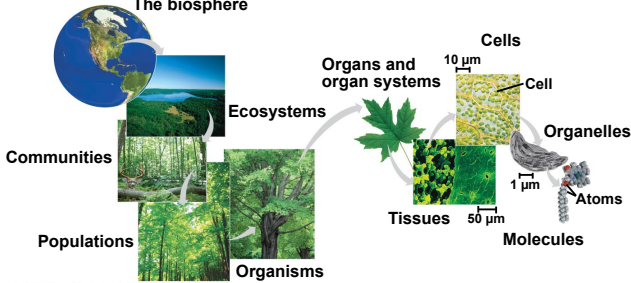
Reproduction

Growth and development

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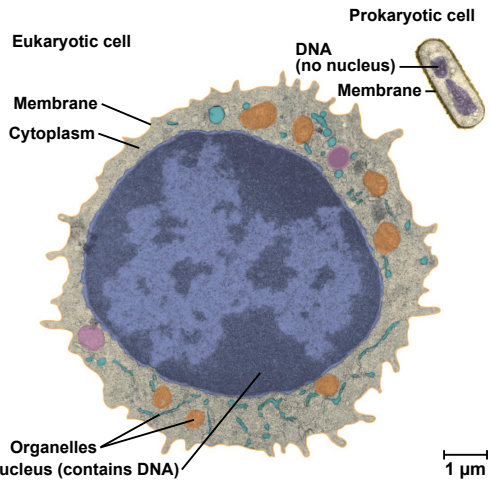
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The biosphere



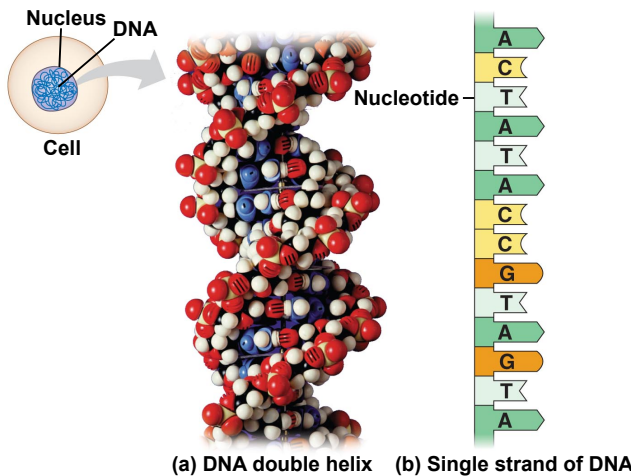
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Classes of Biological Macromolecules

- Lipids
- Polysaccharides
- Proteins
- Nucleic Acids

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Tools of Biotechnology: Centrifuge



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Tools of Biotechnology: Vortexer



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Tools of Biotechnology: Tubes



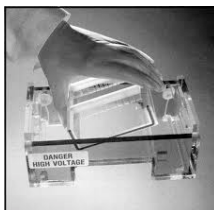
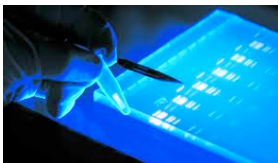
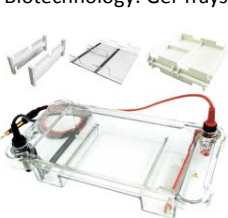
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Tools of Biotechnology: Racks



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Tools of Biotechnology: Gel Trays



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Tools of Biotechnology: Power Supplies



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Tools of Biotechnology: Pipettes



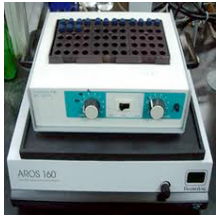
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Tools of Biotechnology: Pipettors



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Tools of Biotechnology: Heat Blocks



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