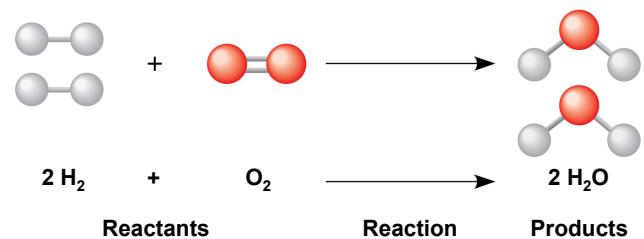


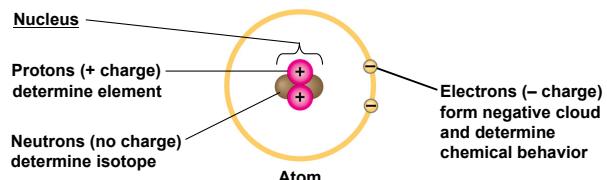
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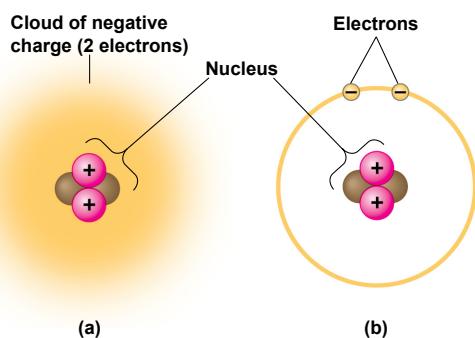
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Table 2.1 Elements in the Human Body		
Element	Symbol	Percentage of Body Mass (including water)
Oxygen	O	65.0%
Carbon	C	18.5%
Hydrogen	H	9.5%
Nitrogen	N	3.3% }
Calcium	Ca	1.5%
Phosphorus	P	1.0% }
Potassium	K	0.4%
Sulfur	S	0.3% }
Sodium	Na	0.2%
Chlorine	Cl	0.2%
Magnesium	Mg	0.1% }
Trace elements (less than 0.01% of mass): 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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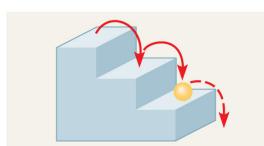


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(a) A ball bouncing down a flight of stairs provides an analogy for energy levels of electrons.

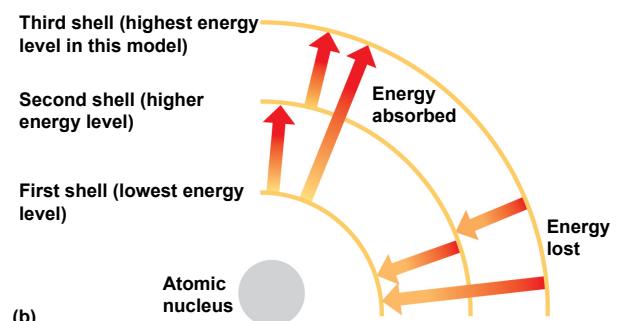


Third shell (highest energy level in this model)

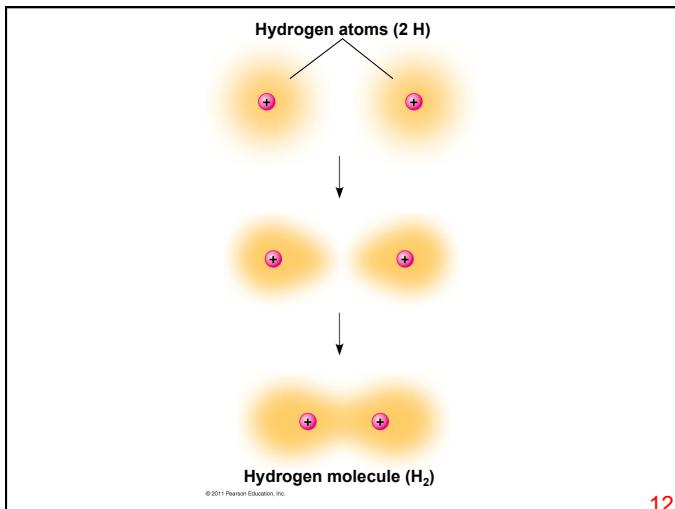
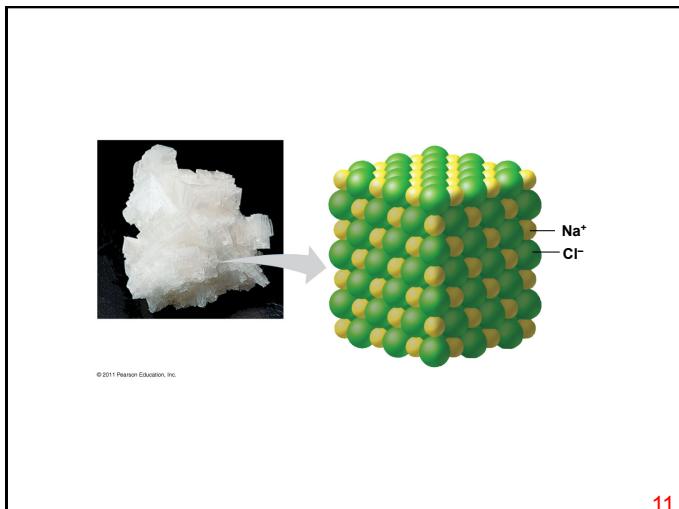
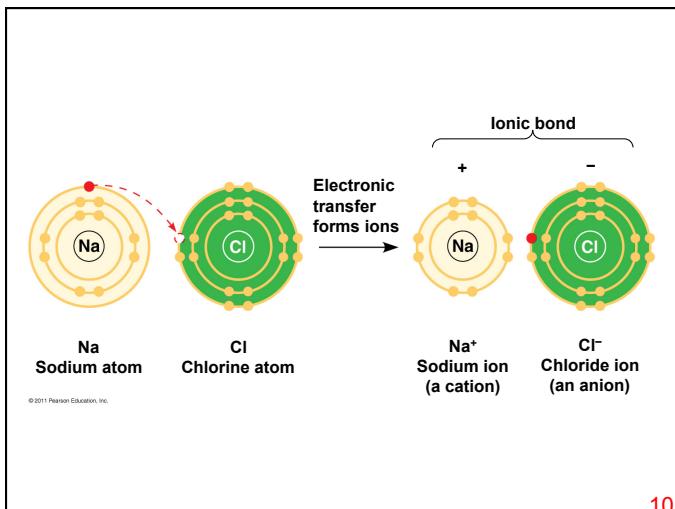
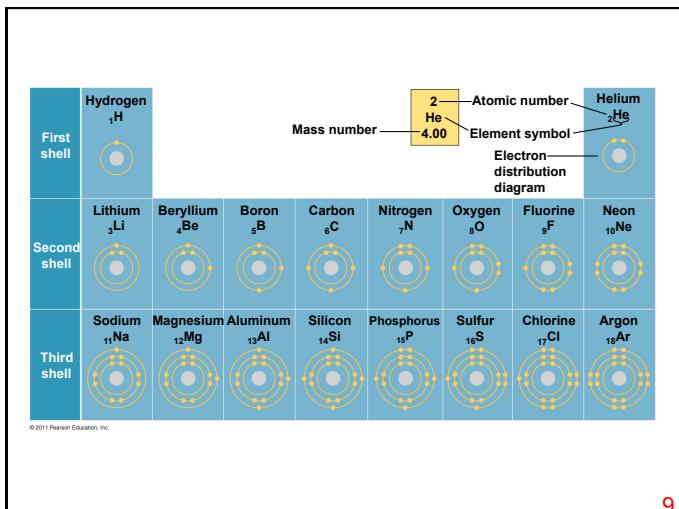
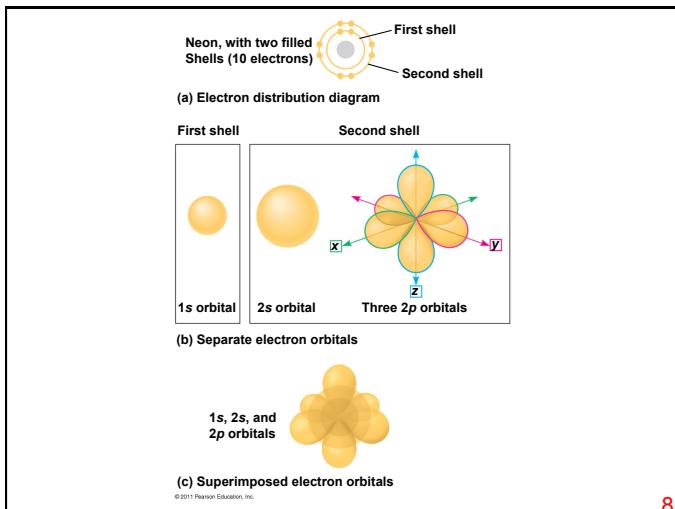
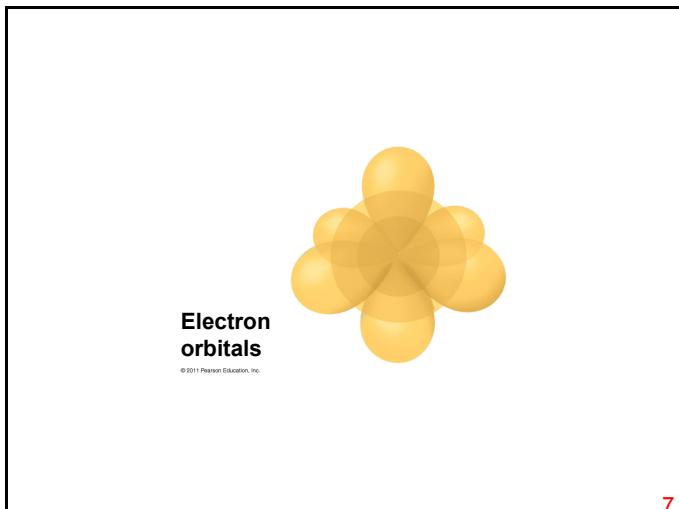
Second shell (higher energy level)

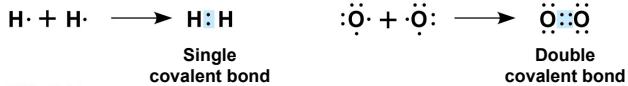
First shell (lowest energy level)

(b)
Atomic nucleus



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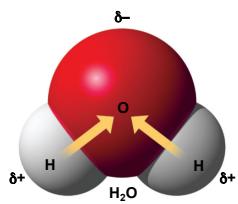
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Name and Molecular Formula	Electron Distribution Diagram	Lewis Dot Structure and Structural Formula	Space-Filling Model
(a) Hydrogen (H_2)		$\text{H}:\text{H}$ $\text{H}-\text{H}$	
(b) Oxygen (O_2)		$:\ddot{\text{O}}\text{:}\ddot{\text{O}}:$ $\text{O}=\text{O}$	
(c) Water (H_2O)		$:\ddot{\text{O}}\text{:}\text{H}$ $\text{O}-\text{H}$	
(d) Methane (CH_4)		$\text{H}:\text{C}:\text{H}$ $\text{H}-\text{C}-\text{H}$	

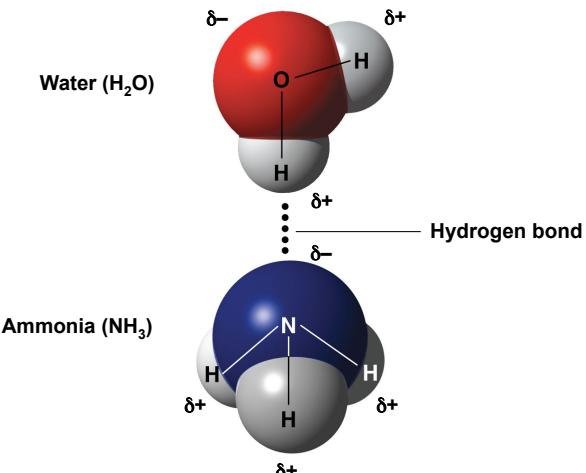
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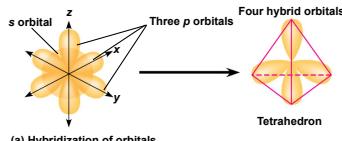


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Space-Filling Model	Ball-and-Stick Model	Hybrid-Orbital Model (with ball-and-stick model superimposed)
Water (H_2O)	$\text{H}-\ddot{\text{O}}-\text{H}$	$\text{H}-\ddot{\text{O}}-\text{H}$

Molecular-shape models

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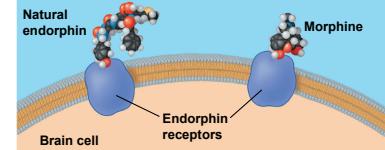
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Natural endorphin



Morphine

(a) Structures of endorphin and morphine



(b) Binding to endorphin receptors

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