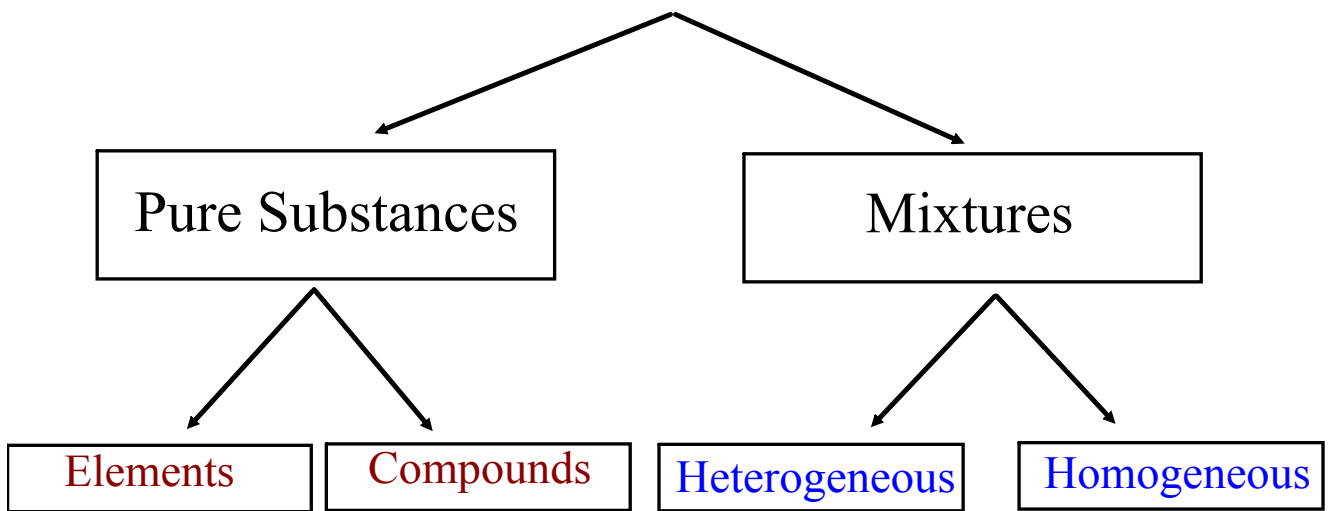


Warm Up

	Element	Compound	Molecule
Fe_2O_3	X	✓	✓
F_2	✓	X	✓
Mo	✓	X	X
CO	X	✓	✓
NaHCO_3	X	✓	✓

Matter



METALS
NONMETALS

Molecules

A molecule is formed when two or more atoms join together chemically.

A compound is a molecule that contains at least two different elements.

All compounds are molecules but not all molecules are compounds.

EXERCISE

p. 52 #20-27

Matter & Its Diversity

physical changes - are those in which **no new substances are formed**.

Ex. boiling - $\text{H}_2\text{O}_{(l)} \rightarrow \text{H}_2\text{O}_{(g)}$

• chemical changes - are those in which a **new substance is formed**.

Ex. $\text{C} + \text{O}_2 \rightarrow \text{CO}_2$

↓
chemical reaction

qualitative knowledge - describes changes in matter not involved with a measured quantity. Ex. color

quantitative knowledge - involves a measure of the **amount** of matter or the **amount** of change in a measurable property of matter.

- involves a number (usually)

Ex. mass of magnesium is 1.2 g

empirical knowledge - observable information that can be measured.

Ex. dinosaurs did exist

theoretical knowledge - explains observations in terms of ideas.

Ex. dinosaurs died 65 million years ago due to an asteroid strike.

COMPONENTS OF EXPERIMENTAL DESIGN

Manipulated Variable (independent variable)

- the property that is being changed

Responding Variable (dependent variable)

- the property that changes as a result of the change in the manipulated variable.

Controlled Variable

- a property that is kept constant.

Example: How does sleep affect performance in school?

Elements

Metals - substances that are shiny, bendable and good conductors of electricity and heat.

Ex. gold

Nonmetals - are not shiny, bendable and are not good conductors.

Solid nonmetals are brittle and lack luster.

Ex. sulfur (S)

Most nonmetals are gases

Ex. oxygen

Metalloids - elements that have properties that are similar to metals and nonmetals.

SUMMARY

⇒ Metals and nonmetals separated by the "staircase line".

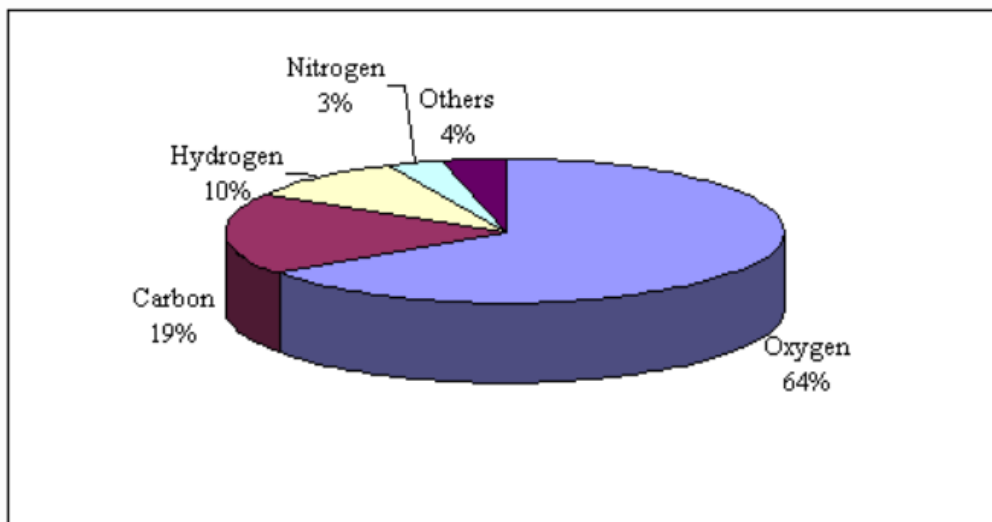
The most common elements in the human body are:

1 - oxygen - 65%

2 - carbon - 18%

3 - hydrogen - 10%

<http://www.freeinfosociety.com/site.php?postnum=658>



Traditional Groups

Alkali Metals - elements found in group 1. They normally are soft, silver-colored metals that react readily with water forming basic solutions.

Alkaline Earth Metals - elements found in group 2. They are light, reactive metals that form oxide coatings.

Halogens - elements in group 17
- are extremely reactive nonmetals.

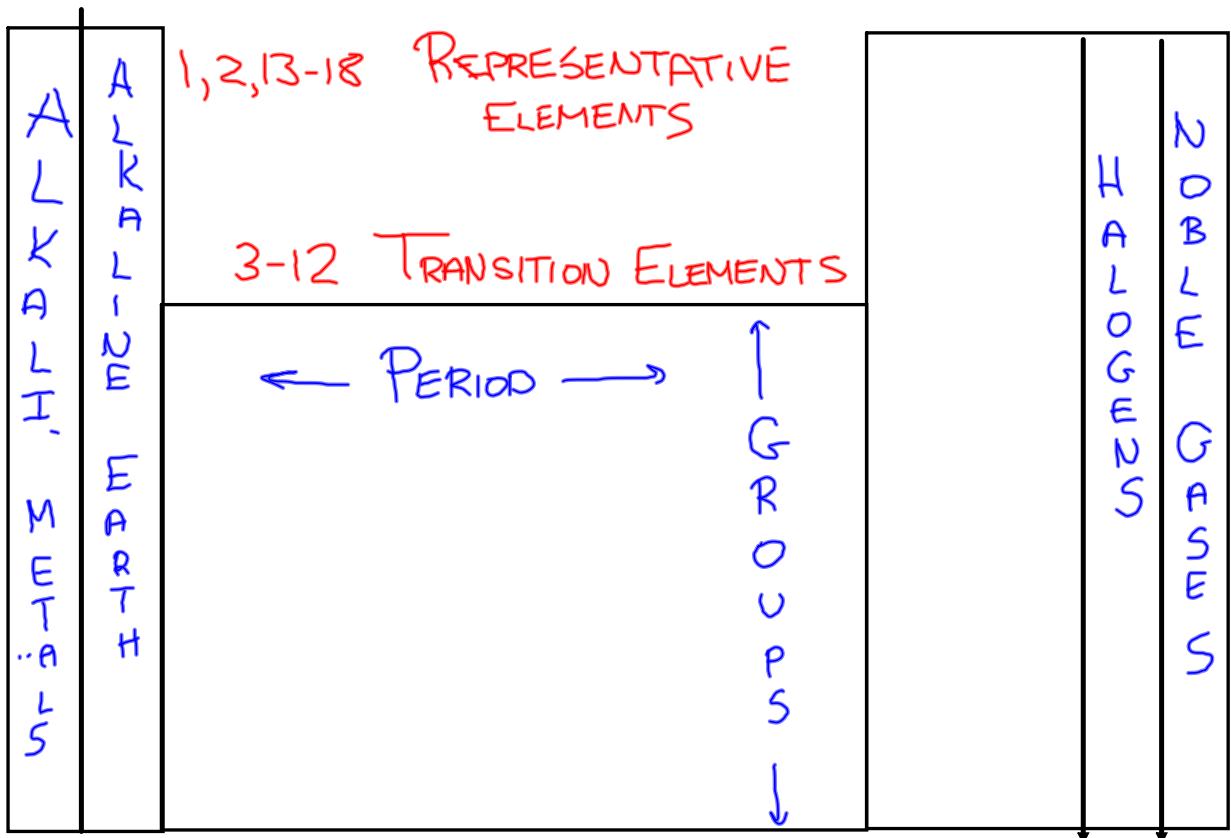
Noble Gases - elements in group 18
- very unreactive gases.

Representative Elements - are elements in groups 1, 2, 13 to 18. These elements best follow the periodic law and are often used to demonstrate theories.

Transition Elements - elements found in groups 3 to 10 ("D block")
- elements whose electrons enter inner shells as atomic number increases

Atomic Mass - is the relative mass of an atom as compared to the mass of a carbon atom. (has been assigned a mass of 12 a.m.u's.)

1 atomic mass unit (a.m.u) - is 1/12 the mass of a carbon atom.



Period	1A	2A											3A	4A	5A	6A	7A	8A	
	H	He	Metals										B	C	N	O	F	Ne	
	Li	Be	Nonmetals and Noble gases										Al	Si	P	S	Cl	Ar	
	Na	Mg	3B	4B	5B	6B	7B	8B		1B	2B	Ga	Ge	As	Se	Br	Kr		
	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	In	Sn	Sb	Te	I	Xe	
	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	Hg	Tl	Pb	Bi	Po	At	Rn
	Cs	Ba	Unq		Unp	Unh	Uns	Uno	Une										
	Fr	Ra																	
6	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
7	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr				

Periodic Table of the Elements

I		Transition Metals										III						IV	V	VI	VII	0																								
H ¹																			He ²																											
Li ³	Be ⁴											B ⁵	C ⁶	N ⁷	O ⁸	F ⁹	Ne ¹⁰																													
Na ¹¹	Mg ¹²	III B	IV B	V B	VI B	VII B	VIII B					IB	II B	Al ¹³	Si ¹⁴	P ¹⁵	S ¹⁶	Cl ¹⁷	Ar ¹⁸																											
K ¹⁹	Ca ²⁰	Sc ²¹	Ti ²²	V ²³	Cr ²⁴	Mn ²⁵	Fe ²⁶	Co ²⁷	Ni ²⁸	Cu ²⁹	Zn ³⁰	Ga ³¹	Ge ³²	As ³³	Se ³⁴	Br ³⁵	Kr ³⁶																													
Rb ³⁷	Sr ³⁸	Y ³⁹	Zr ⁴⁰	Nb ⁴¹	Mo ⁴²	Tc ⁴³	Ru ⁴⁴	Rh ⁴⁵	Pd ⁴⁶	Ag ⁴⁷	Cd ⁴⁸	In ⁴⁹	Sn ⁵⁰	Sb ⁵¹	Te ⁵²	I ⁵³	Xe ⁵⁴																													
Cs ⁵⁵	Ba ⁵⁶	57-71	Hf ⁷²	Ta ⁷³	W ⁷⁴	Re ⁷⁵	Os ⁷⁶	Ir ⁷⁷	Pt ⁷⁸	Au ⁷⁹	Hg ⁸⁰	Tl ⁸¹	Pb ⁸²	Bi ⁸³	Po ⁸⁴	At ⁸⁵	Rn ⁸⁶																													
Fr ⁸⁷	Ra ⁸⁸	89-103	Rf ¹⁰⁴	Ha ¹⁰⁵	106	107	108	109																																						
Lanthanides		<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>57</td><td>58</td><td>59</td><td>60</td><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td><td>71</td> </tr> <tr> <td>La</td><td>Ce</td><td>Pr</td><td>Nd</td><td>Pm</td><td>Sm</td><td>Eu</td><td>Gd</td><td>Tb</td><td>Dy</td><td>Ho</td><td>Er</td><td>Tm</td><td>Yb</td><td>Lu</td> </tr> </table>															57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
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89	90	91	92	93	94	95	96	97	98	99	100	101	102	103																																
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr																																

	Metal		Metalloid		Nonmetal
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