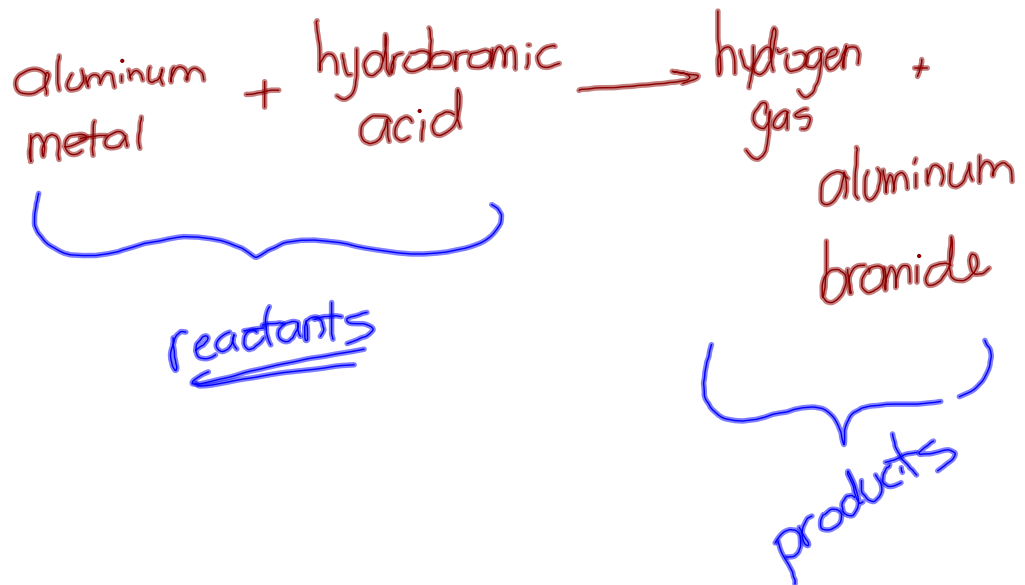
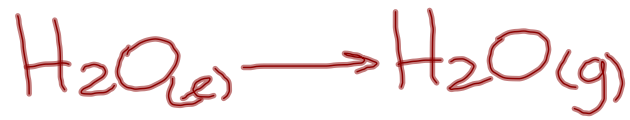


Warm Up

	Element	Compound	Molecule
Fe_2O_3		✓	✓
S_8	✓		✓
Mo	✓		
NO		✓	✓
Na_2CO_3		✓	✓

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Chemical Properties

A chemical property is a characteristic **behaviour**. This must occur when a substance changes to a new substance.

The actual change is a chemical change.

Ex. Iron + oxygen \Rightarrow Iron (III) oxide



Combustibility

Substance will react with oxygen to produce carbon dioxide, water vapour and energy.







Ex. Burning of gasoline

Particle Theory

Developed by a philosopher named Democritus who said all substances were made of particles too small to be seen.

- All matter is made of tiny particles.
- All particles of one substance are the same. Different substances are made of different particles.
- The particles are always moving.
- There are attractive forces between the particles.

Table 1 The Particle Theory of Matter

Principle	Illustration
1. All matter is made up of tiny particles.	
2. All particles of one substance are the same. Different substances are made of different particles.	substance A  substance B 
3. The particles are always moving. The more energy the particles have, the faster they move.	 hot cold
4. There are attractive forces between the particles. These forces are stronger when the particles are closer together.	particles far apart—force weak  particles close together—force strong 

Periodic Table

Periodic table - a structured arrangement of elements that help us explain and predict physical and chemical properties.

Metals are generally located on the left, while the non-metals are located on the right side of the table.
(staircase line)

Periodic Table of the Elements

1	2																	10	11
1	H																	He	
2	3	4																	10
2	Li	Be																	Ne
3	11	12																	18
3	Na	Mg																	Ar
4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	
5	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	
6	55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	
6	Cs	Ba	*La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	
7	87	88	89	104	105	106	107	108	109	110	111	112	113						
7	Fr	Ra	+Ac	Rf	Ha	Sg	Ns	Hs	Mt	110	111	112	113						

* Lanthanide Series	58	59	60	61	62	63	64	65	66	67	68	69	70	71
	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
+ Actinide Series	90	91	92	93	94	95	96	97	98	99	100	101	102	103
	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Hydrogen, the lightest element, is the exception to almost every rule in chemistry. Although it is located on the left side of the staircase, it behaves mostly as a **nonmetal**.

Metals are normally shiny, malleable, conductors, react with acid, and are mostly solids at room temperature.

Non-metals are generally dull, brittle, good insulators, do not react with acid, and can be solid, liquids or gas at room temperature.

Chemical Families (groups) are vertical columns in the periodic table. They tend to have similar physical and chemical properties.

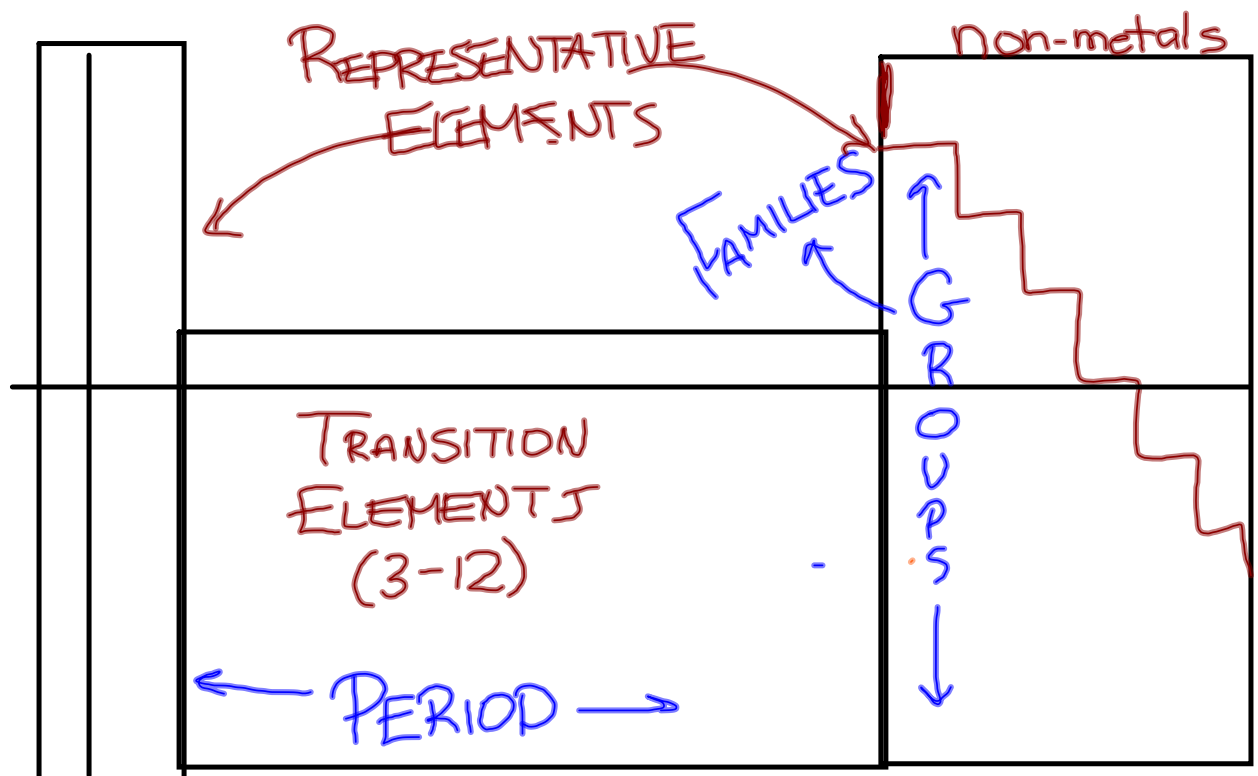
Alkali metals (group 1) are shiny, silvery metals and form compounds that are mostly white solids and soluble in water.

Alkaline earth metals (group 2) are shiny, silvery metals, but they form compounds that are not soluble in water.

The *halogens* (group 17) generally react with alkali metals.

Noble gases (group 18) generally do not form compounds.

metalloids - properties of metals and
non-metals



metals