

# Elements and the Periodic Table

# Do now

What do you think a chemical is?

- A **chemical** is a solid, liquid or gas that is used in a chemical process.
- Made up of elements!
- There are lots of chemicals, including:
  - Drugs
  - Alcohol
  - Food

# Periodic Table

- Element are organised in the Periodic Table.

**Periodic Table of Elements**

1																	2						
H																	He						
3	4																	5	6	7	8	9	10
Li	Be																	B	C	N	O	F	Ne
11	12	III B	IV B	V B	VI B			VII B			VII		IB	IB	13	14	15	16	17	18			
Na	Mg																	Al	Si	P	S	Cl	Ar
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36						
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr						
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54						
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe						
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86						
Cs	Ba	*La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn						
87	88	89	104	105	106	107	108	109	110														
Fr	Ra	+Ac	Rf	Ha	106	107	108	109	110														









\* 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

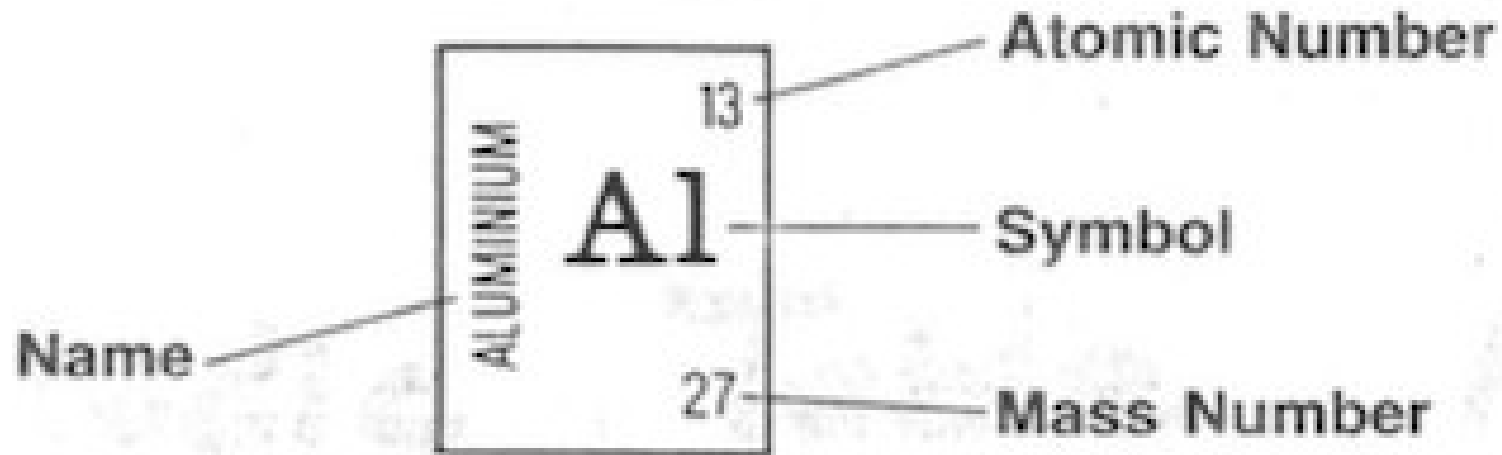
90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Legend - click to find out more...

<b>H - gas</b>	<b>Li - solid</b>	<b>Br - liquid</b>	<b>Tc - synthetic</b>
 Non-Metals	 Transition Metals	 Rare Earth Metals	 Halogens
 Alkali Metals	 Alkali Earth Metals	 Other Metals	 Inert Elements

# Periodic Table

- We get useful information from the table:



# Getting familiar with the table

- Using a digital periodic table, work with a partner on the “Finding Elements” activity.



- Once done, individually, pick ONE element and write an acrostic poem about what it looks like, its properties and uses.
  - I’ll give a prize for the best two poems.

An example:

**N**ever react

Nobl**E** gas

**O**odourless

Atomic # te**N**

# Getting familiar with the table

- Hopefully while you did that activity, you noticed a few **patterns**:
  - Elements are listed in order of their atomic number.
  - The atomic mass gets bigger as you move through the table.
  - Not all symbols match their name.
  - Symbols with two letters: **first letter is capital and second letter is lower case**



# Elements in Chemical Formula

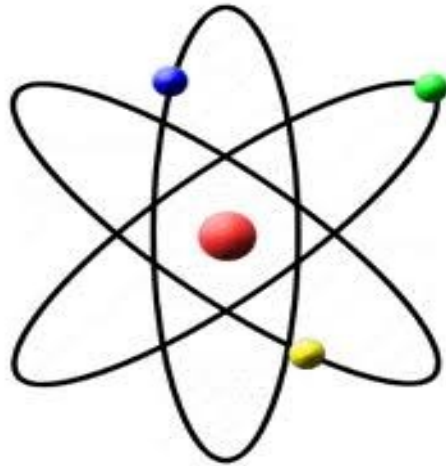
- Look at these formulas, what elements are in them?

Alcohol	Ethanol	Salt	Psilocybin *chemical in magic mushrooms	Baking Soda
Formula	$C_2H_6O$	$H_2SO_4$	$C_{12}H_{17}N_2O_4P$	$NaHCO_3$
Elements in them	Carbon Hydrogen Oxygen			

# So, what is an element?

- **Element**

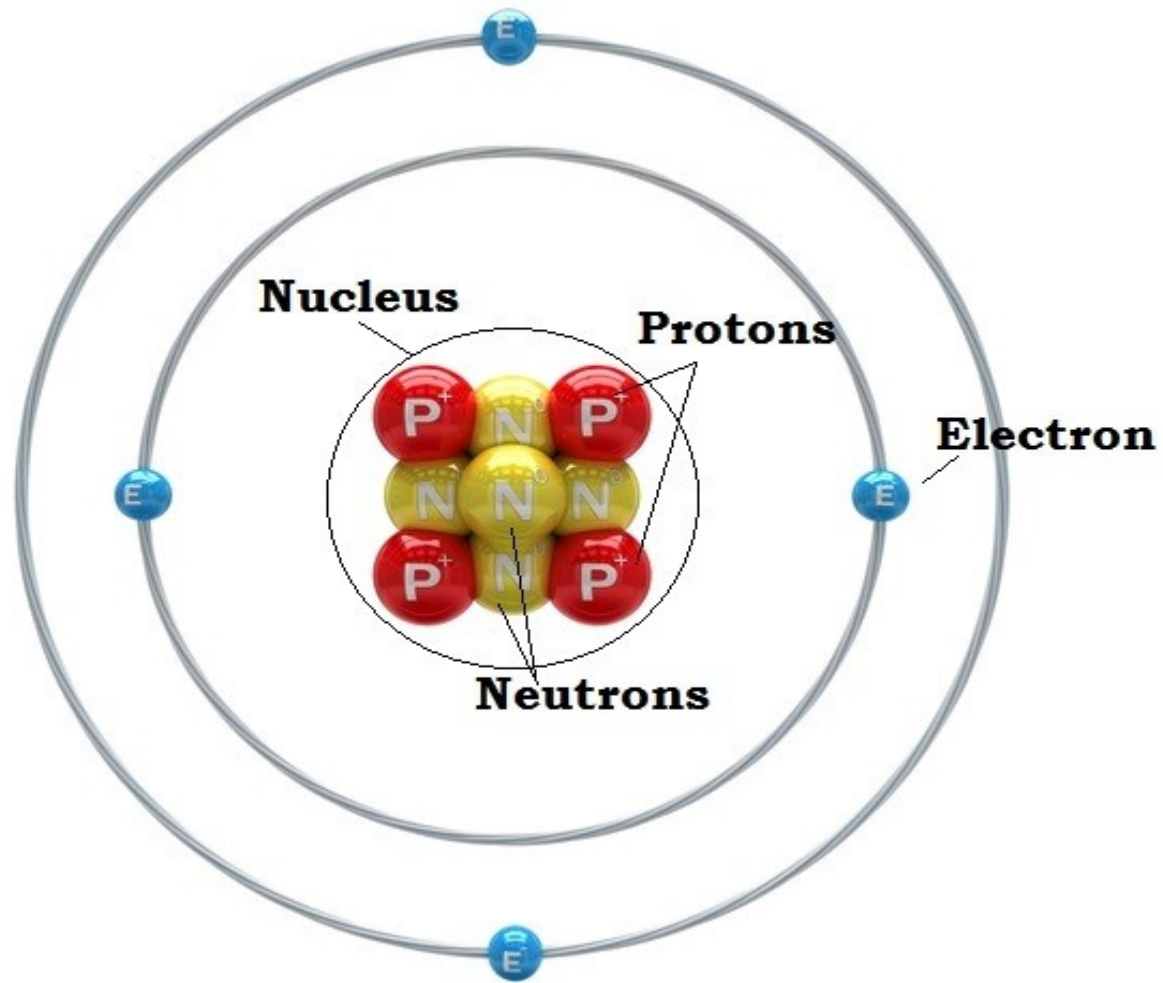
- VERY small (cant see with our eyes)
- Cannot be broken down chemically into anything smaller (it is made of one type of an **ATOM**)



# Inside the atom

- Atoms have three parts:
  - Protons – positively charged
  - Electrons – negatively charged
  - Neutrons – neutral
- The protons and neutrons are at the center of the atom and electrons are in clouds around the center.

# Atomic Structure



# Atomic Structure

- **Atoms want to remain stable (neutral), meaning not having a charge.**
- To do this, the protons (positive) and electrons (negative) are the same!
  - Neutrons are neutral already.

# Atomic Structure

- To calculate the number of protons, neutrons and electrons:
- # of **protons** = Atomic #
- # of **electrons** = # of protons (to be stable)
- # of **neutrons** = Atomic mass – atomic #
- **Note: The atomic mass is the mass of protons and neutrons. Electrons are too small to measure their mass.**

# Atomic Structure Activities

- #1 – Atomic Structure Sentence jumble – fix up the sentences so they are correct
- #2 – Atomic structure questions – follow the instructions in the document