

Elements

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An element is a pure substance that is made from a single type of atom. Elements are the building blocks for all the rest of the matter in the world. Examples of elements include iron, oxygen, hydrogen, gold, and helium.

Atomic Number

An important number in an element is the atomic number. This is the number of protons in each atom. Each element has a unique atomic number. Hydrogen is the first element and has one proton, so it has an atomic number of 1. Gold has 79 protons in each atom and has an atomic number of 79. Elements in their standard state also have the same number of electrons as protons.



Silicon (Atomic number 14) is an important element in electronics

Forms of an Element

Even though elements are all made from the same type of atoms, they can still come in different forms. Depending on their temperature they can be solid, liquid, or gas. They can also take different forms depending on how tightly the atoms are packed together. Scientists call these allotropes. One example of this is carbon. Depending on how carbon atoms fit together they can form diamond, coal, or graphite.

How many elements are there?

There are currently 118 known elements. Of these, only 94 are thought to naturally exist on Earth.

Families of Elements

Elements are sometimes grouped together because they have similar properties. Here a few of the types:

Noble Gases - Helium, neon, argon, krypton, xenon, and radon are all noble gases. They are unique in that the outer shell of their atoms is full of electrons. This means they don't

react much with other elements. They are often used in signs as they glow in bright colors when an electrical current is passed through them.

Alkali Metals - These elements have just 1 electron in the outer shell of their atom and are very reactive. Some examples are lithium, sodium, and potassium.

Other groups include transition metals, nonmetals, halogens, alkali earth metals, actinides, and lanthanides.

Periodic Table

An important way of learning and understanding elements for chemistry is the periodic table. You can learn more about this on our [periodic table of elements](#) page.

		Group																															
		I	II											III	IV	V	VI	VII	VIII														
1	H																	2	He														
2	3 Li	4 Be																	10 Ne														
3	11 Na	12 Mg																	18 Ar														
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr															
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe															
6	55 Cs	56 Ba	*	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn															
7	87 Fr	88 Ra	**	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og															
8	119 Un																																
* Lanthanides				57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu															
** Actinides				89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr															

Periodic Table of Elements

Fun Facts about Elements

- Elements found on Earth and Mars are exactly the same.
- Hydrogen is the most common element found in the universe. It is also the lightest element.
- Isotopes are atoms of the same element, with different numbers of neutrons.
- In ancient times the elements referred to fire, earth, water, and air.
- Helium is the second most common element in the universe, but is very rare on the Earth.