

matter

Any substance that has mass, is composed of atoms and occupies space.

atom

Fundamental unit of matter having unique chemical properties; it is composed of a nucleus and an electron cloud. One atom is distinguished from another by the number of protons in its nucleus.

nucleus

Central part of the atom whose electric charge is positive; it is composed of protons and neutrons, around which electrons revolve.

neutron

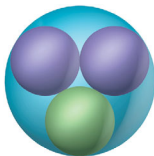
Constituent particle of an atom's nucleus whose electric charge is neutral; it is composed of one u quark and two d quarks.

proton

Constituent particle of an atom's nucleus whose electric charge is positive; it is composed of two u quarks and one d quark.

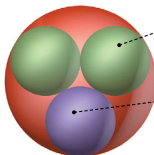
proton

Constituent particle of an atom's nucleus whose electric charge is positive; it is composed of two u quarks and one d quark.



neutron

Constituent particle of an atom's nucleus whose electric charge is neutral; it is composed of one u quark and two d quarks.

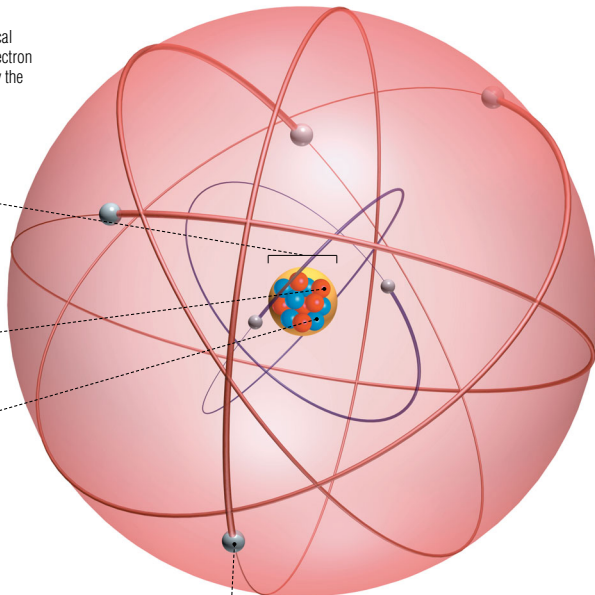


d quark

The d quark (down) is one of six types of quarks (constituent particles of protons and neutrons) having a negative electric charge.

u quark

The u quark (up) is one of six types of quarks (constituent particles of the protons and neutrons) having a positive electric charge.

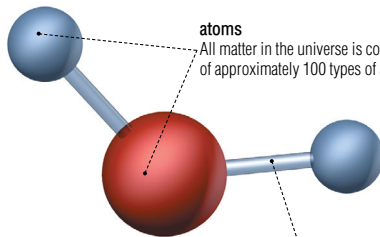


electron

Particle having a negative electric charge that revolves around the nucleus of the atom.

molecule

Matter composed of atoms that constitutes the smallest unit of a pure body that can exist in a free state (e.g., water and carbon dioxide).



atoms

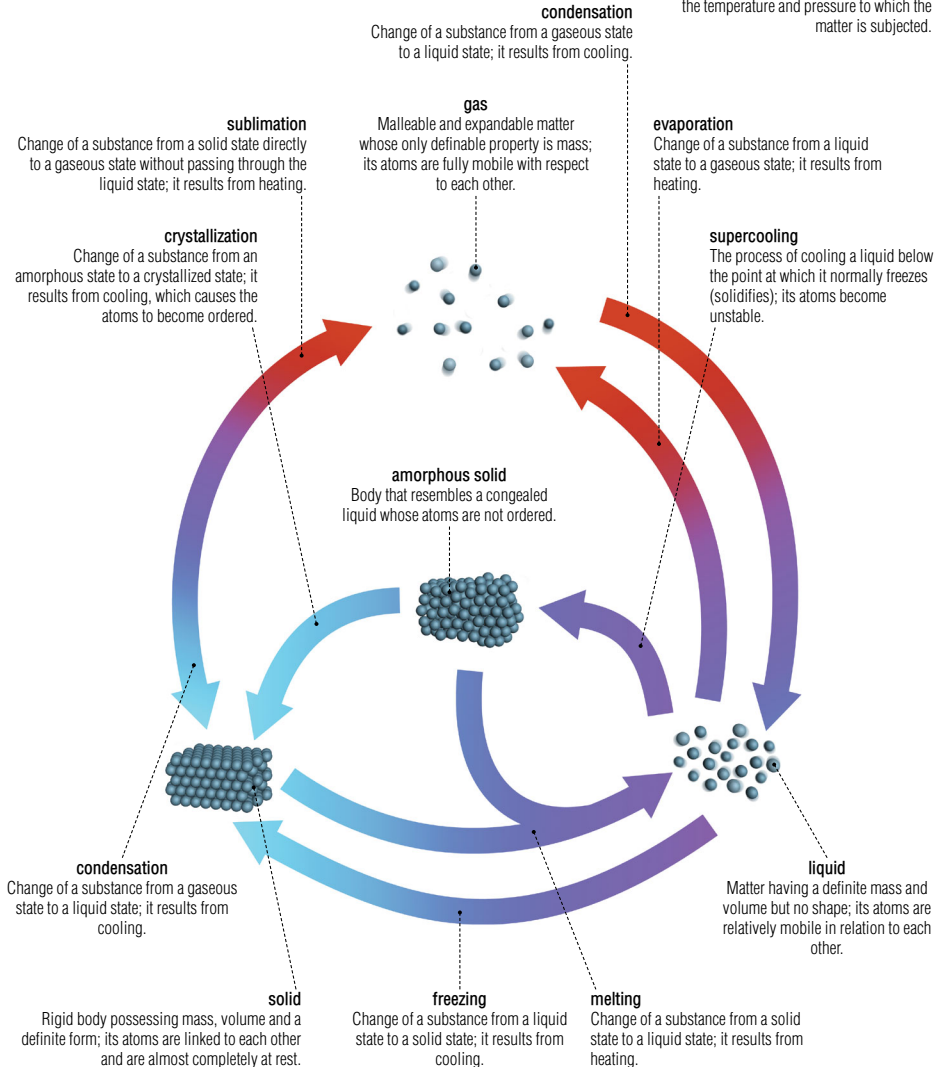
All matter in the universe is composed of approximately 100 types of atoms.

chemical bond

Force that unites two atoms through the sharing of a common electron (covalent bond) or the transfer of electrons (ionic bond) to form a molecule.

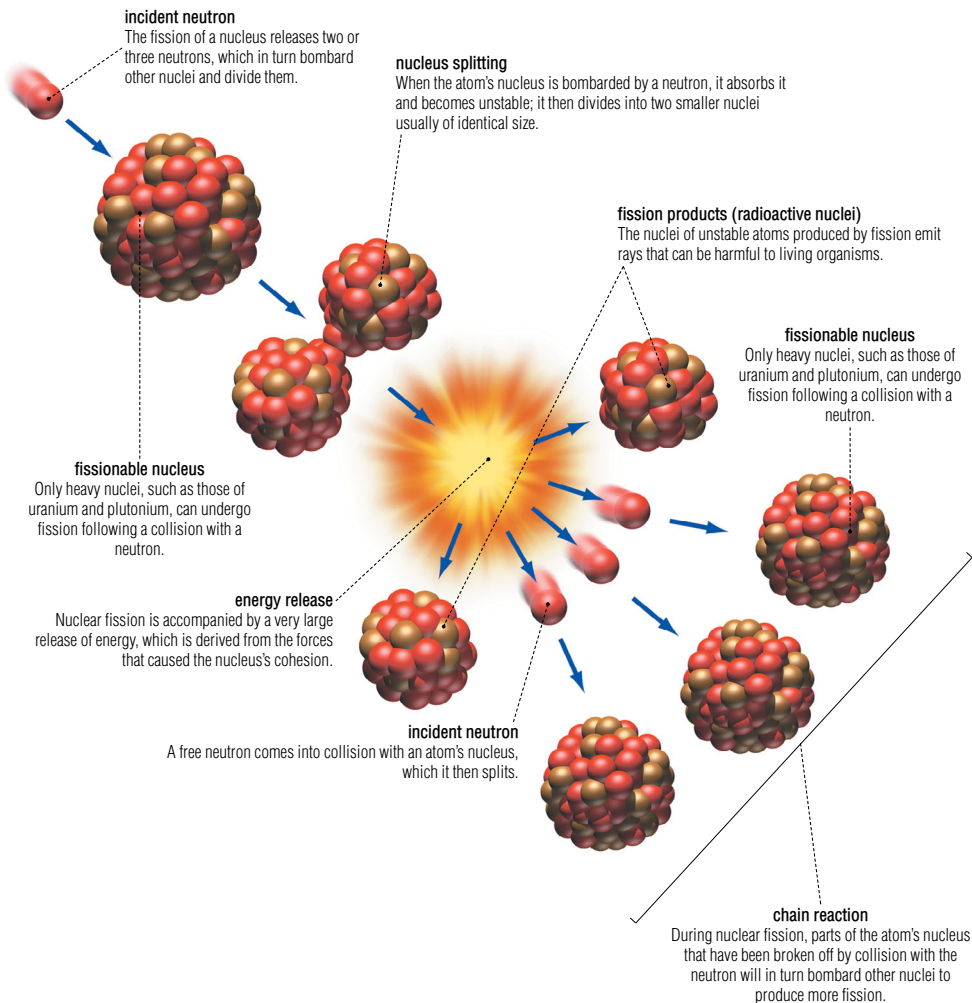
states of matter

Matter exists in three fundamental states (solid, liquid and gaseous), which depend on the temperature and pressure to which the matter is subjected.



nuclear fission

Process by which the atoms' nuclei become fragmented (e.g., in a nuclear reactor); neutrons are released and energy is produced in the form of heat.



heat transfer

Heat transfer occurs in three ways that are related to molecular movement: conduction, convection and radiation.

convection

Heat generation in a fluid that is caused by a variation in temperature resulting from the movement of molecules. Here, the heated water expands, rises and releases its heat to the surrounding air.

vapor

Gaseous state of water above its boiling point (water boils and is converted to vapor at 212°F or 100°C).

liquid

Matter having a definite mass and volume but no shape; its atoms are relatively mobile in relation to each other.

radiation

Heat generation in the form of electromagnetic waves emitted by a heated body (solid, liquid or gas).

convection current

Movement of fluid caused by a difference in density, which transfers heat. The heated water rises and is replaced by the cooler water from the surface.

flame

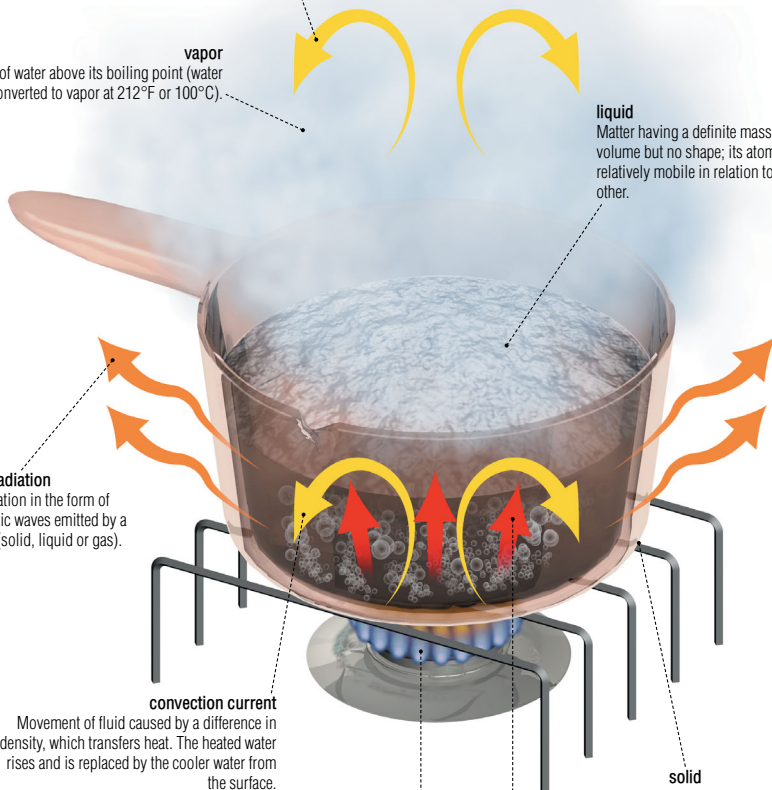
Incandescent gas resulting from the combustion of a mixture of gas and air; it produces heat and light.

solid

Rigid body possessing mass, volume and a definite form; its atoms are linked to each other and are almost completely at rest.

conduction

Heat generation in a body (usually a solid) or between two bodies in contact; the molecules vibrate but no matter moves.



There are more than 110 chemical elements, most of which are naturally present in the universe. The others are created artificially in the laboratory.

Table created by Dmitry Mendeleev in 1869 that classifies the now approximately 110 known chemical elements such as oxygen, hydrogen, iron and lead. The elements are classified in order of their atomic weight and arranged into groups having similar properties.

12

hydrogen
 This gas is the most abundant element in the universe and makes up part of the composition of water. It is used especially in petrochemistry and rocket engines.

								2 He
			5 B	6 C	7 N	8 O	9 F	10 Ne
			13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
110 Ds	111 Rg	112 Uub						
63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr