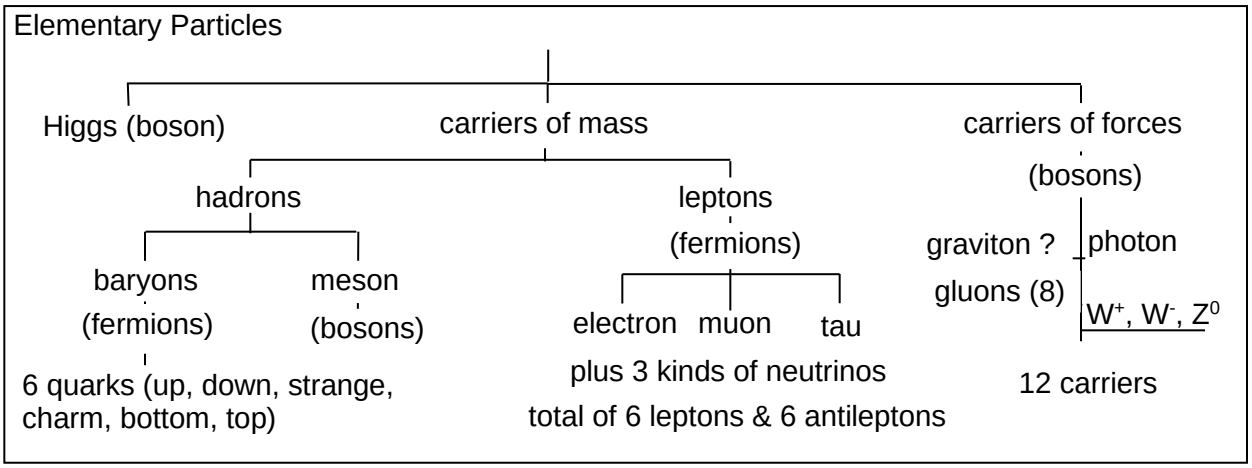

The electron is a member of a family of fundamental particles called leptons (from Greek leptos meaning small). There are 6 leptons (electron, muon and tau along with, electron neutrino, muon neutrino and tau neutrino). Leptons (and antileptons) are particles that do not experience the strong force. They are treated as point particles with no internal structure.

Hadrons (from Greek hadros meaning thick) are particles with size and structure and are much more numerous than leptons. They experience the strong force and are made up of quarks (with 6 "flavours") called up (u), down (d), strange (s), charmed (c) bottom (b) and top (t). Quarks have a fractional charge. The up, charmed and top quarks have a charge of +2/3 *e* and the down, strange and bottom quarks have a charge of –1/3 *e*. There are also 6 antiquarks. A bar is placed over the quark symbol is used to indicate its antiquark. The quarks and antiquarks also have a property referred to as colour (which has nothing to do with actual colour) and is simply a property required in order to keep them in different quantum states. There are 3 possible "colours", red, green and blue for each quark making a total of 18 quarks and an equal number of antiquarks.

The hadrons are divided into two subclasses, mesons and baryons. Mesons (e.g., pion) have masses that lie between the mass of the electron and the mass of a proton. Mesons consist of 1 quark and 1 antiquark. Baryons (from the Greek meaning heavy) have a mass equal to or greater than proton mass and they consist of a total of 3 quarks (and antibaryons have 3 antiquarks). Protons and neutrons are included in the baryon family. The proton (uud) has 2 up quarks and 1 down quark whereas the neutron (udd) is made up 1 up quark and 2 down quarks.

The third class of particles are the field particles, which are mediators of the forces. These include the photon for electromagnetic force, the W^+, W^-, Z^0 particles for the weak force, the gluons for the strong force (there are 8) and the hypothetical graviton for the gravitational force.

An important property of particles is spin and particles can also grouped according to spin. All particles that have an integer spin are called bosons and those that have ½ integer spin are called fermions. All mesons have integer spin and are therefore bosons. Baryons have half integer spin and are fermions. All quarks and leptons are also fermions. Finally, there is particle known as Higgs boson that was discovered in 2012. Its existence is required in particle theory in relationship to mass and matter.

There seems to be a lot of fundamental particles. There are 18 quarks (when colour included) and 18 antiquarks for a total of 36. Another 6 leptons and 6 antileptons adding 12 more particles to the mix. The 8 gluons, 3 particles for weak interaction, photon, and Higgs boson bring the grand total to 61 particles.