

Baryons decay produces another baryon.

The only stable baryon is Proton.

Baryons are made up of 3 quarks combination.

Baryons are divided into nucleons and hyperons. Hyperons are heavier than nucleons.

**Table of nucleons**

Symbol	Particle	Quark Combination
p	Proton	uud
n	Neutron	udd
$\bar{p}$	Antiproton	$\bar{u}\bar{u}\bar{d}$
$\bar{n}$	Antineutron	$\bar{u}\bar{d}\bar{d}$

**Table of some hyperons:**

$\Delta^{++}$	Delta	uuu
$\Delta^+$	Delta	uud
$\Delta^0$	Delta	udd
$\Delta^-$	Delta	ddd
$\lambda^0$	Lambda	uds
$\Sigma^+$	Sigma	uus
$\Sigma^0$	Sigma	uds
$\Sigma^-$	Sigma	dds
$\Xi^0$	Xi	uss
$\Xi^-$	Xi	dss
$\Omega^-$	Omega	sss

b) **Mesons:**

In Greek, “meson” stands for intermediate & so particles which have intermediate masses are named as Mesons. The mesons are bosons.

Mesons can decay without necessarily producing other hadrons. Mesons are made up of a quark and antiquark.

**Table of some mesons**

Symbol	Particle	Quark Combination
$\pi^+$	Pion	$u\bar{d}$
$\pi^0$	Pion	$\frac{u\bar{u} - d\bar{d}}{\sqrt{2}}$
$\pi^-$	Pion	$\bar{u}d$
$K^+$	Kaon	$u\bar{s}$
$K^0$	Kaon	$d\bar{s}$
$K^-$	Kaon	$\bar{u}s$
$\eta$	eta	$\frac{u\bar{u} + d\bar{d} + s\bar{s}}{\sqrt{6}}$













**Generation of elementary particles:**

The generation is a division (classification) of elementary particles on the basis of their mass. There are three generations of elementary particles.

Each member of higher generation has higher mass than the corresponding particles of previous generation. Hence, being massive, the particles of higher generations ultimately decay into first generation particles.

*Everyday matter is made of particles from first generation.*

Higher generation particles are seen in extremely high energy environments (like cosmic rays).

	Quarks		Leptons	
<b>Generation 3</b>	 <b>t</b> Top	 <b>b</b> Bottom	 <b><math>\tau</math></b> Tau	 <b><math>\nu_\tau</math></b> Tau-neutrino
<b>Generation 2</b>	 <b>c</b> Charm	 <b>s</b> Strange	 <b><math>\mu</math></b> Muon	 <b><math>\nu_\mu</math></b> Muon-neutrino
<b>Generation 1</b>	 <b>u</b> Up	 <b>d</b> Down	 <b>e</b> Electron	 <b><math>\nu_e</math></b> Electron-neutrino