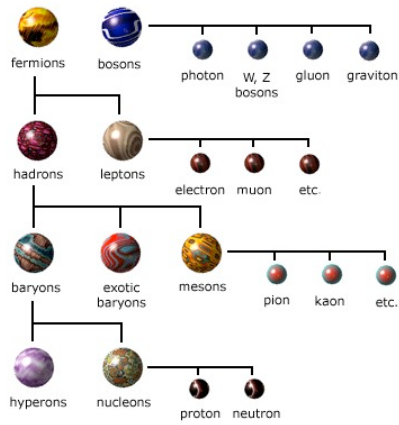


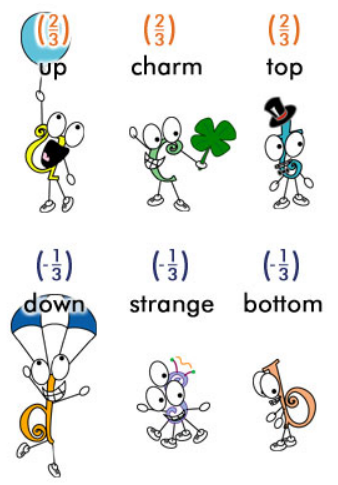
Classification of Particles



Which particles feel the **strong nuclear force**?

Which particle is the most stable **baryon**? Draw its subatomic structure:

		Three Generations of Matter (Fermions)				
		I	II	III		
mass		2.4 MeV	1.27 GeV	171.2 GeV	0	
charge		$\frac{2}{3}$	$\frac{2}{3}$	$\frac{2}{3}$	0	
spin		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	1	
name		u	c	t	γ	
		up	charm	top	photon	
		d	s	b	g	
		down	strange	bottom	gluon	
		<2.2 eV	<0.17 MeV	<15.5 MeV	91.2 GeV	
		0	0	0	1	
		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	1	
		ν_e	ν_μ	ν_τ	Z	
		electron neutrino	muon neutrino	tau neutrino	weak force	
		0.511 MeV	105.7 MeV	1.777 GeV	80.4 GeV	
		-1	-1	-1	± 1	
		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	1	
		e	μ	τ	W	
		electron	muon	tau	weak force	



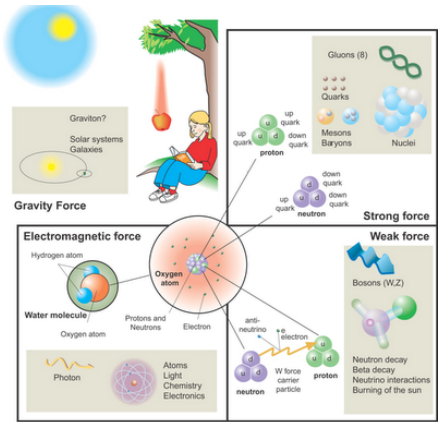
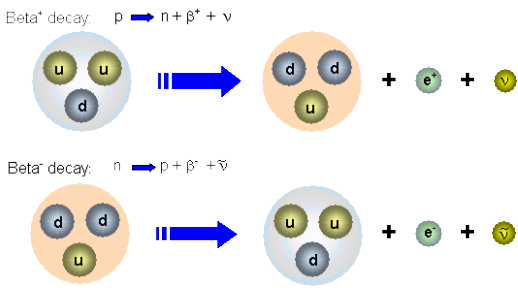
What does the **weak interaction** do to the quark type?

What four properties are always conserved in particle interactions?

What force are **leptons** subject to?

What's the difference between a hadron and a lepton?

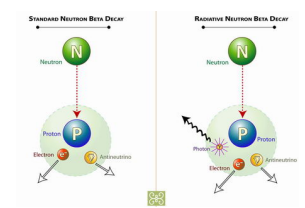
Name this particle?



Describe the four fundamental forces of nature:

Draw a Feynman diagram to describe β^- decay (include quarks):

Describe what happens to **quarks** in β^- and β^+ decay?



Explain using your knowledge about conservation laws how β^- decay is possible?