

three generations of matter  
(fermions)

I

II

III

mass  
charge  
spin

$\approx 2.4 \text{ MeV}$

$\frac{2}{3}$

$\frac{1}{2}$

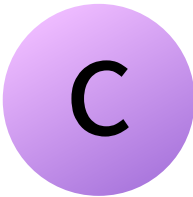


up

$\approx 1.275 \text{ GeV}$

$\frac{2}{3}$

$\frac{1}{2}$

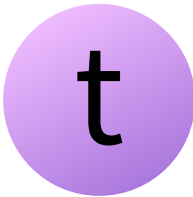


charm

$\approx 172.44 \text{ GeV}$

$\frac{2}{3}$

$\frac{1}{2}$



top

0

0

1



gluon

$\approx 125.09 \text{ GeV}$

0

0



Higgs

QUARKS

$\approx 4.8 \text{ MeV}$

$-\frac{1}{3}$

$\frac{1}{2}$



down

$\approx 95 \text{ MeV}$

$-\frac{1}{3}$

$\frac{1}{2}$



strange

$\approx 4.18 \text{ GeV}$

$-\frac{1}{3}$

$\frac{1}{2}$



bottom

0

0

1



photon

$\approx 0.511 \text{ MeV}$

-1

$\frac{1}{2}$



electron

$\approx 105.67 \text{ MeV}$

-1

$\frac{1}{2}$

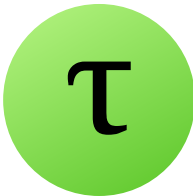


muon

$\approx 1.7768 \text{ GeV}$

-1

$\frac{1}{2}$



tau

$\approx 91.19 \text{ GeV}$

0

1



Z boson

$< 2.2 \text{ eV}$

0

$\frac{1}{2}$



electron  
neutrino

$< 1.7 \text{ MeV}$

0

$\frac{1}{2}$



muon  
neutrino

$< 15.5 \text{ MeV}$

0

$\frac{1}{2}$



tau  
neutrino

$\approx 80.39 \text{ GeV}$

$\pm 1$

1



W boson

GAUGE BOSONS

SCALAR BOSONS

LEPTONS