

QUARKS

LEPTONS

1<sup>st</sup>      2<sup>nd</sup>      3<sup>rd</sup>

2.2 M  
**u**    +2/3  
          1/2  
 up

1.27 G  
**c**    +2/3  
          1/2  
 charm

173.21 G  
**t**    +2/3  
          1/2  
 top

4.7 M  
**d**    -1/3  
          1/2  
 down

96 M  
**s**    -1/3  
          1/2  
 strange

4.18 G  
**b**    -1/3  
          1/2  
 bottom

0.51 M  
**e**    -1  
          1/2  
 electron

105.66 M  
**μ**    -1  
          1/2  
 muon

1.78 G  
**τ**    -1  
          1/2  
 tau

< 2  
**ν<sub>e</sub>**    0  
          1/2  
 e neutrino

< 0.19 M  
**ν<sub>μ</sub>**    0  
          1/2  
 μ neutrino

< 18.2 M  
**ν<sub>τ</sub>**    0  
          1/2  
 τ neutrino

Mass: eV/c<sup>2</sup>  
 Charge  
 Spin  
 Name

strong nuclear force

0  
**g**    0  
          1  
 gluon

0  
**γ**    0  
          1  
 photon

125.09 G  
**H**    0  
          0  
 higgs

electromagnetic force

weak nuclear force

80.38 G  
**W**    ±1  
          1  
 W boson

91.18 G  
**Z**    0  
          1  
 Z boson

FERMIONS

GAUGE BOSONS