

Three Generations
of Matter (Fermions) spin 1/2

I

II

III

mass →

2.4 MeV

1.27 GeV

171.2 GeV

charge →

2/3

2/3

2/3

name →

Left

up

Right

Left

charm

Right

Left

top

Right

Quarks

4.8 MeV

104 MeV

4.2 GeV

-1/3

-1/3

-1/3

Left

down

Right

Left

strange

Right

Left

bottom

Right

0 eV

Left

electron
neutrino

0 eV

Left

muon
neutrino

0 eV

Left

tau
neutrino

Leptons

0.511 MeV

105.7 MeV

1.777 GeV

-1

-1

-1

Left

electron

Right

Left

muon

Right

Left

tau

Right

0

0

g

gluon

0

0

γ

photon

91.2 GeV

0

Z⁰

weak
force

124.9 GeV

0

0

H

Higgs
boson

spin 0

Bosons (Forces) spin 1

80.4 GeV

± 1

W[±]

weak
force