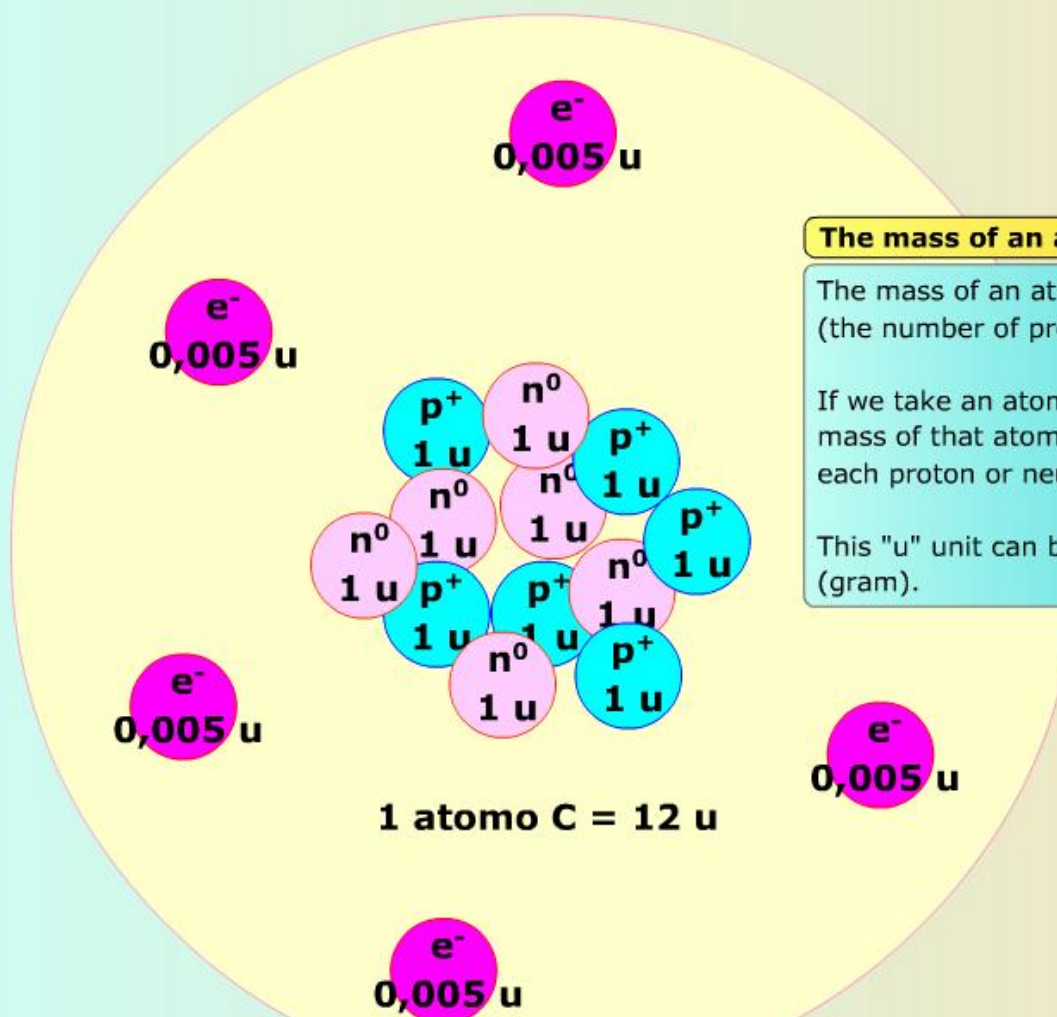


The Concept of Mole



The mass of an atom

The mass of an atom is given by the mass number (the number of protons and neutrons together)

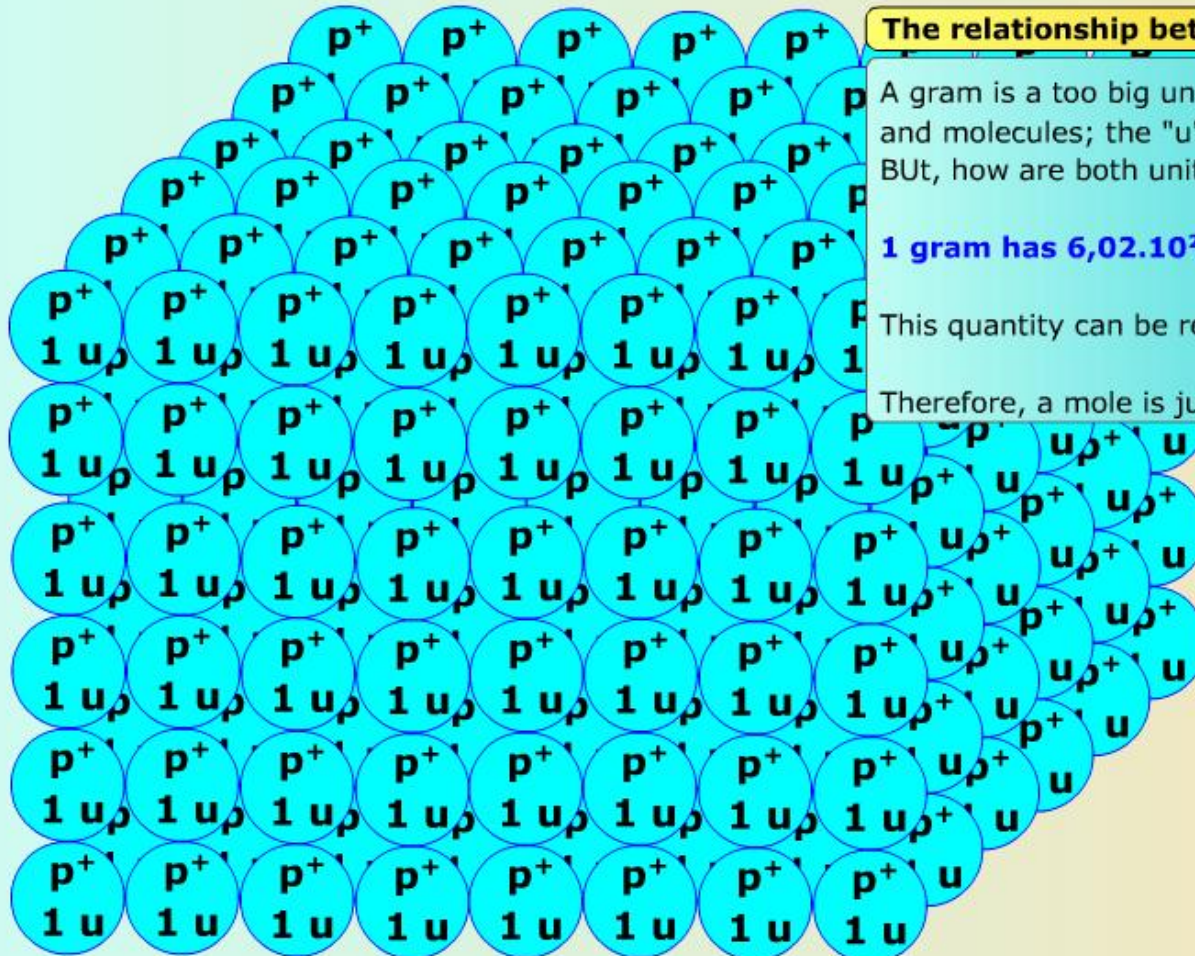
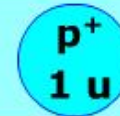
If we take an atom of carbon, we will see that the mass of that atom is 12 u (amu); because the mass of each proton or neutron is 1 u.

This "u" unit can be related to the most known "g" (gram).

The Concept of Mole

1 g

= $6,02 \cdot 10^{23}$ u



The relationship between units

A gram is a too big unit to measure the mass of atoms and molecules; the "u" unit is more adequate for that. BUT, how are both units related?

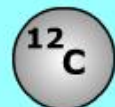
1 gram has $6,02 \cdot 10^{23}$ u units.

This quantity can be referred to as a "**mole**"

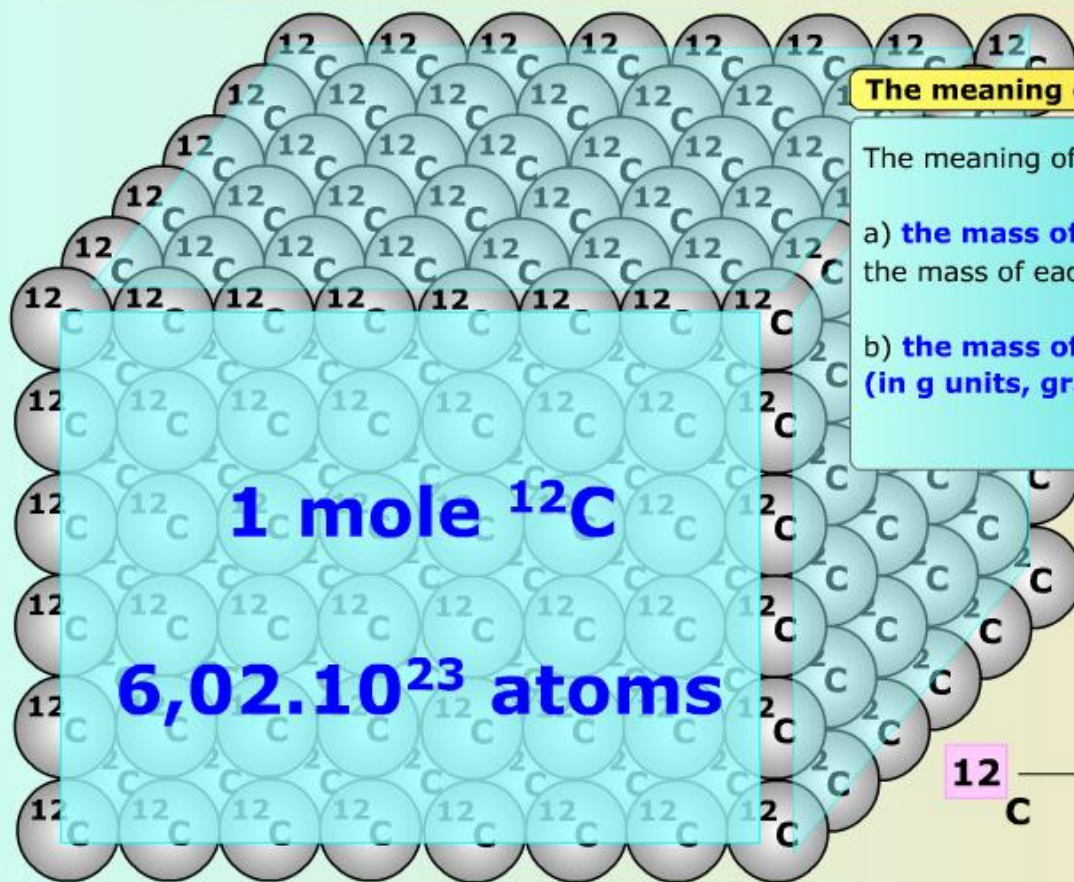
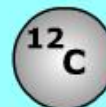
Therefore, a mole is just a quantity.

The Concept of Mole

1 mol of



= $6,02 \cdot 10^{23}$ atoms



The meaning of the mass number

The meaning of the mass number is twofold :

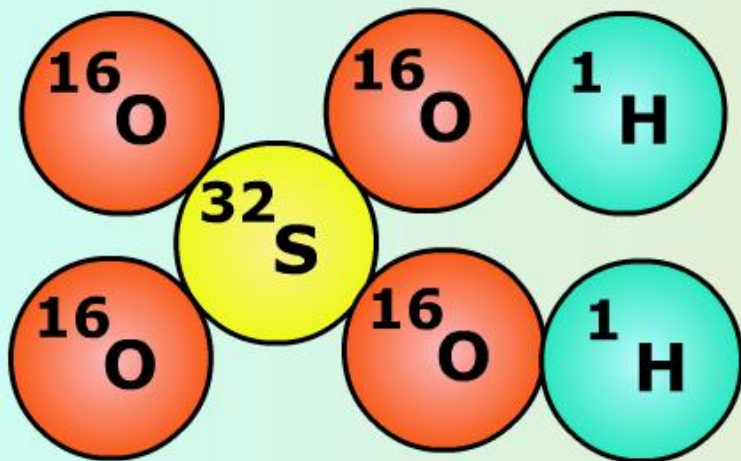
- the mass of an atom (in u units)** (in our case, the mass of each atom is 12 u)
- the mass of a mole ($6,02 \cdot 10^{23}$ C atoms) of atoms (in g units, grams)**



mass
number

→ 1 atom of C = 12 u
1 mol of C atoms = 12 g

The Concept of Mole



Molecular mass and molar mass

To calculate the molecular mass, we add all the masses of the atoms that take part in that molecule. The result will be in "u" units.

The molar mass (the mass of a mole of molecules) can be calculated in the same way; in this case the result will be in g (grams).

