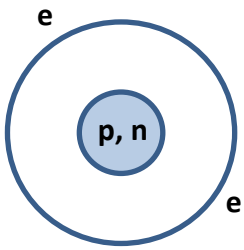
CONCEPT: ELECTRIC CHARGE



- Atoms are made of protons, neutrons and electrons.

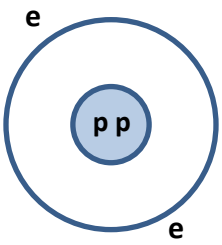
- ELECTRIC CHARGE is a property of matter, similar to MASS:

MASS (m)	ELECTRIC CHARGE (Q)
- Mass → Gravitational Force	- Electric Charge → Electric Force
- More Mass → More Gravity	- More Charge → More Electric Force
- Mass → ONLY _____	- Charge → _____ and _____

- ELEMENTARY charge → $\mathbf{e = \_\_\_\_\_\ C}$ (_____)

  - Charge of protons = _____ - Charge of electrons = _____

- The CHARGE of an object is the quantity of _____ of protons and electrons in it:



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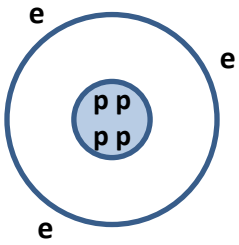

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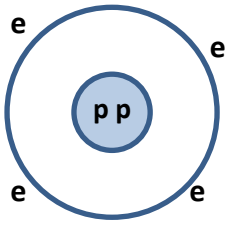

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- Notice these charges are in WHOLE MULTIPLES of **e**.

→ $\mathbf{Q = (\#prot - \#elec) \times e}$

- MOST materials are NEUTRAL → #Protons _____ #Electrons → Q_{net} = ____

PRACTICE: CHARGE OF ATOM

What is the charge of an atom with 16 protons and 7 electrons?

EXAMPLE: NUMBER OF ELECTRONS

How many electrons make up $-1.5 \times 10^{-5}\ C$?

EXAMPLE: ELECTRONS IN WATER

Water has a density of 1 kg/L, a molecular weight of 18 g/mol, and 10 electrons per molecule.

a) How many electrons does 2L of water have?

b) What charge do these electrons represent?

PRACTICE: ADDING ELECTRONS

How many electrons do you have to add to decrease the charge of an object by 16μC?