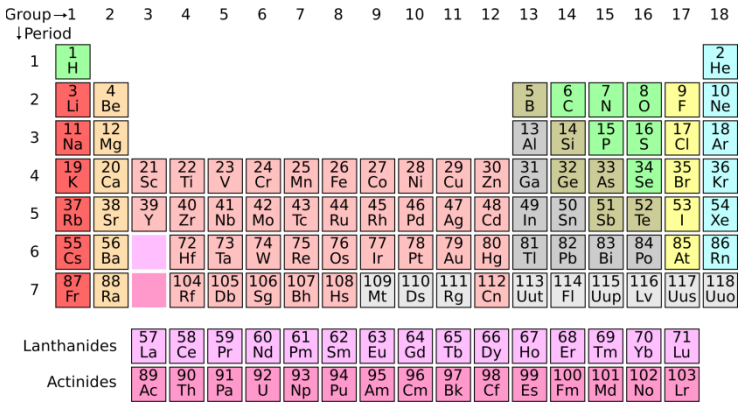
The periodic table holds over 100 elements that are the basis for all forms of matter. Each element has a unique electronic structure made up of small sub-atomic particles. These particles are called protons, electrons and neutrons.



Protons and neutrons are the particles with the largest mass and are located in the middle of the atom. This is called the nucleus. The electrons are tiny in mass and are located in energy shells around the outside of the nucleus.

Task 1

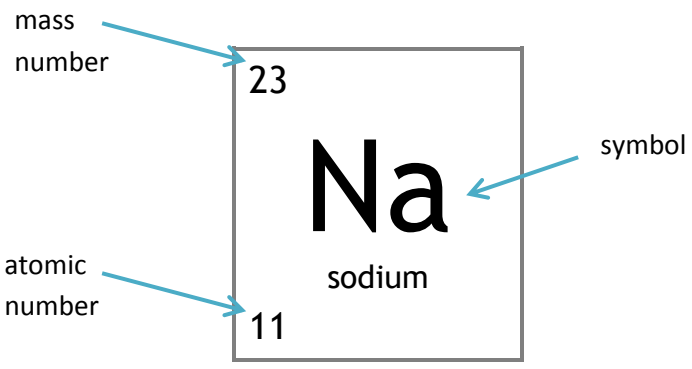
Use this information to draw a diagram of the structure of the atom.

Task 2

Use the information to identify which particle is which in the table.

Particle	Mass	Charge
a.	almost zero	-1
b.	1	0
c.	1	+1

Each element has its own box within the periodic table. This contains lots of vital information about each element.



Task 3

Define the following key terms:

atomic number **mass number**

We can use these numbers to work out the number of each sub-atomic particle. The atomic number was once known as the 'proton number' and this tells us the number of protons in one atom. We assume that there is the same number of electrons as protons in an atom. This is because their negative charge is balanced by the positively charged protons.

The number of neutrons is calculated by taking away the atomic number from the mass number.

Task 4

Copy and complete the table below working out how many of each particle oxygen and chlorine have.

Element	Protons	Neutrons	Electrons
sodium	11	23-11=12	11
oxygen			
chlorine			

Task 5

Use the words in the box to copy and complete the paragraph below.

Atoms consist of a central ..... containing protons and ..... . The nucleus is ..... compared to the size of the whole atom. The nucleus is surrounded by ..... in energy levels (also called shells). Atoms have no overall electrical charge because they contain the same number of ..... and electrons.

electrons	neutrons	nucleus	protons	small

Task 6

Use the periodic table and the information already in the table below to write down the missing entries a) to j).

Symbol	Element	Mass number	Atomic number	Number of protons	Number of electrons	Number of neutrons
H	hydrogen	1	1	a) ___	1	0
Li	lithium	b) ___	3	3	3	4
C	carbon	12	c)___	6	6	6
d)___	e)_____	16	8	8	8	8
Mg	magnesium	24	12	f)___	g)___	12
P	phosphorous	h)___	15	15	15	16
S	sulphur	i)___	16	j)___	16	16

Answers

Task 2

a. electron
b. neutron
c. proton

Task 4

Element	Protons	Neutrons	Electrons
sodium	11	23-11=12	11
oxygen	8	16 – 8 = 8	8
chlorine	17	35 – 17 = 18	17

Task 5

Atoms consist of a central **nucleus** containing protons and **neutrons**. The nucleus is **small** compared to the size of the whole atom. The nucleus is surrounded by **electrons** in energy levels (also called shells). Atoms have no electric charge because they contain the same number of **protons** and electrons.

Task 6

Symbol	Element	Mass number	Atomic number	Number of protons	Number of electrons	Number of neutrons
H	hydrogen	1	1	**a)1**	1	0
Li	lithium	**b)7**	3	3	3	4
C	carbon	12	**c)6**	6	6	6
d)O	**e)oxygen**	16	8	8	8	8
Mg	magnesium	24	12	**f)12**	**g)12**	12
P	phosphorous	**h)31**	15	15	15	16
S	sulfur	**i)32**	16	**j)16**	16	16