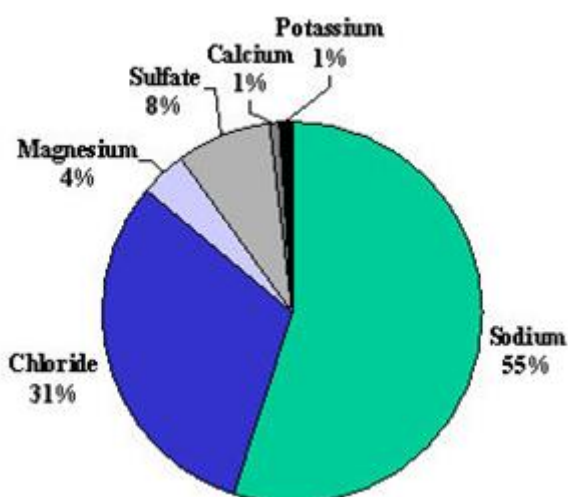


Homework 1 – Structure of Atoms

- 1) What is the name of the structure at the centre of all atoms?
- 2) The following grid contains statements that could apply to subatomic particles:

A	It has a positive charge
B	It has a negative charge
C	It has a relative mass of almost zero
D	It has a relative mass of 1
E	It is found inside the nucleus
F	It is found outside the nucleus

- a) Identify the statements that relate to electrons.
 - b) Identify the statements that relate to protons.
 - c) Identify the statements that relate to neutrons.
- 3) Explain by mentioning the names of subatomic particles, their charges and how many of them there are, why atoms are neutral.
 - 4) A water sample was taken from the river Forth. The percentage of ions identified in a sample of water is shown below:



- a) A total of 2500 ions were collected from the 50cm³ water sample. Calculate how many chloride ions make up part of the total ions collected.
- b) Four more 50cm³ water samples were collected and analysed for their ion content. The results for the magnesium ion are shown below. Complete the table by calculating the average percentage obtained from the five samples.

50cm ³ of water from Forth	% of magnesium in each sample
1	4
2	6.7
3	5.5
4	4.8
5	4.2

National 5 Extension

- Write the symbol with nuclide notation for the following:
 - An atom of carbon with 6 protons and 6 neutrons.
 - An atom of chlorine with 18 neutrons.
- Describe the relationship between the number of outer electrons an atom has and which periodic table group it is in.
- A sample of the element silver was shown to exist as a mixture of two isotopes: 48% Ag (107), 52% Ag (109).
 - What is meant by the term isotope?
 - Copy and complete the table below for the first isotope:

Isotope	Number of protons	Number of neutrons	Number of electrons
$^{107}_{47}\text{Ag}$			

- The relative atomic mass of an element can be calculated using the formula:

$$\frac{(\text{mass of isotope A} \times \% \text{ of isotope A}) + (\text{mass of isotope B} \times \% \text{ of isotope B})}{100}$$

From the percentage abundance of each isotope of silver in the sample calculate the relative atomic mass for this sample of silver.