Topic Introduction

Summarize your understanding of each paragraph.

Most of the mass of atoms comes from the protons and the neutrons. The number of protons DEFINES the element. The number of neutrons often equals the number of protons. BUT the number of neutrons in an atom might be slightly fewer or more than the number of protons.

If the number of neutrons were ALWAYS equal to the number of protons, then the average mass of an atom would be double the atomic number. But the number of neutrons is not always equal to the number of protons. (Recall these are called isotopes).

The average mass of an element is expressed in grams. A sample of an element with a mass equal to that element's average atomic mass contains 1 mol of atoms. For example, 1 mol of Aluminum (1 mol Al) has 6.023×10^{23} atoms with a mass of 26.98 grams.

One mole of something consists of 6.023×10^{23} units of that substance. That's a huge number, and somewhat difficult to imagine. A common way to visualize that big number is that one mole of marbles would cover the earth to a depth of 50 miles!