

Question 6 (Answer: **B**)

- A weighted mean needs both the mass of each isotope and how common it is.
- So you need the relative isotopic mass and the relative abundance of each isotope.
- How *many* isotopes exist, or how many atoms there are, tells you nothing about the average.

Question 6 (Answer: **C**)

- Let the fraction of ^{63}Cu be x : $63x + 65(1 - x) = 63.5$.
- $65 - 2x = 63.5$, so $x = 0.75$.
- That is 75% ^{63}Cu and 25% ^{65}Cu – the average sits nearer 63, so the lighter isotope must dominate.

Question 5 (Answer: **A**)

- $A_r = (238 \times 66 + 244 \times 34)/100$.
- $= (15\,708 + 8296)/100 = 240.04$.
- To three significant figures, 240.

2(a)	protons and neutrons		
2(b)(i)	electron	neutron	proton
	16	18	16
	18	16	16
	1 mark for each correct column		
2(b)(ii)	M1 $(32 \times 95) + (34 \times 5) = 3210$ M2 $3210 / 100 = 32.1$		
2(b)(iii)	^{12}C		
2(c)	M1 Ne M2 Na^+ OR Mg^{2+} OR Al^{3+}		

Question 5 (Answer: **B**)

- Isotopes differ only in neutron number; the proton and electron counts are the same.
- Chemical behaviour depends on the outer electrons, which are identical.
- So their chemical properties match – only physical properties such as mass differ.

Question 6 (Answer: **A**)

- Lithium is in Group I, so each atom loses one electron to form Li^+ .
- Nitrogen is in Group V, so each atom gains three electrons to form N^{3-} .
- Three lithium atoms are needed per nitrogen, which is why the formula is Li_3N .