

Isotopes and Average Atomic Mass

Student Worksheet | g09_u03_w11

I can: distinguish isotopes, calculate weighted average mass, and explain why periodic-table mass is usually decimal.

Frozen values: Classroom calculation values from the frozen source:

audits/atomic_masses_v2024.1.json (CIAAW/IUPAC Standard Atomic Weights 2024, accessed 2026-07-26): C 12.011, Cl 35.45, B 10.81; CIAAW interval values are discussed as intervals.

Vocabulary: isotope, abundance, weighted average, atomic mass unit, mass number.

1. Define isotope.

2. What stays same across isotopes of one element?

3. What differs?

4. Is carbon-14 a new element from carbon-12?

5. Why is chlorine's table mass 35.45 not a whole number?

6. Convert 75.0% to decimal.

7. What must isotope abundances sum to?

8. Calculate average for 75.0% 35.0 u and 25.0% 37.0 u.

9. Calculate average for 20.0% 10.0 u and 80.0% 11.0 u.

10. An element has average 10.81. Is it necessarily one atom's mass?

11. Write the weighted-average setup for 60% 63 u and 40% 65 u.

12. Explain why a more abundant isotope pulls average toward itself.

13. Identify likely average range for 35/37 mixture.

14. Why use guard digits until final rounding?

15. Compare mass number and isotopic mass.

16. A spectrum has two peaks; what evidence could support isotopes?

17. Why does peak height need calibration before becoming abundance?

18. 90.0% 24.0 u, 10.0% 26.0 u: calculate.

19. Average is 35.50 for masses 35 and 37. Find percent 35 isotope.

20. Critique: “all chlorine atoms weigh 35.45 u.”
