What Are Atomic Number and Mass Number?

Worksheet

Atomic number Z = number of protons (defines the element). Mass number A = protons + neutrons (defines the isotope).

Questions

1. An atom has Z=20. How many protons?

A) 10
B) 20
C) 40
D) Cannot tell

2. O has A=16, Z=8. How many neutrons?

A) 8
B) 16
C) 24
D) 32

3. Isotopes are atoms with the same Z but different

A) Z
B) A
C) electrons
D) charge

4. Which determines the element?

A) Mass number A
B) Atomic number Z
C) Number of neutrons
D) Atomic mass

5. Oxygen has atomic number Z=8. How many protons and electrons does a neutral oxygen atom have?

6. Carbon-12 (C) has Z=6. How many neutrons does it have?

7. Uranium-235 (U) has Z=92. How many neutrons?

8. Define: What is atomic number Z?

9. Define: What is mass number A?

10. Define: What do isotopes have in common?

Answer Key

1. B) 20 - Z = atomic number = # protons = 20.
2. A) 8 - N = A Z = 16 8 = 8.
3. B) A - Same element (Z) but different neutron counts (A).
4. B) Atomic number Z - Atomic number Z (proton count) uniquely defines the element.
5. Z = 8 means 8 protons. Neutral atoms have equal electrons: 8 electrons. Oxygen has 8 protons + 8 electrons.
6. Z = 6 protons (from atomic number) A = 12 (mass number) Neutrons = A Z = 12 6 = 6 neutrons
7. Z = 92 protons A = 235 (mass number) Neutrons = 235 92 = 143 neutrons
8. The number of protons in an atom's nucleus. Z uniquely identifies the element.
9. The total number of protons and neutrons (A = Z + N).
10. Same atomic number Z (same element), but different mass numbers A (different neutron counts).