

Name : Date :

Protons, Neutrons, and Electrons Worksheets

1. What is the relative mass of a proton?
2. What is the relative mass of a neutron?
3. What is the relative mass of an electron?
4. What is the atomic number of an element, and what does it represent?
5. How can you calculate the number of neutrons in an atom of an element?
6. Why do atoms have no overall charge despite containing protons and electrons?
7. What is an isotope, and how do isotopes of an element differ?
8. Explain the concept of electron shells in an atom.

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Answers

1. What is the relative mass of a proton?

The relative mass of a proton is approximately 1 atomic mass unit (amu).

2. What is the relative mass of a neutron?

The relative mass of a neutron is approximately 1 atomic mass unit (amu), just like protons.

3. What is the relative mass of an electron?

The relative mass of an electron is much smaller than that of protons and neutrons, nearly $1/1836$ amu.

4. What is the atomic number of an element, and what does it represent?

The atomic number of an element is the number of protons in the nucleus of its atoms. It represents the element's identity and determines its place on the periodic table.

5. How can you calculate the number of neutrons in an atom of an element?

You can calculate the number of neutrons in an atom by subtracting the atomic number (number of protons) from the mass number (total number of protons and neutrons).

6. Why do atoms have no overall charge despite containing protons and electrons?

Atoms have no overall charge because the number of protons (positively charged) equals the number of electrons (negatively charged), which balances out the charges and makes the atom electrically neutral.

7. What is an isotope, and how do isotopes of an element differ?

Isotopes are atoms of the same element with the same number of protons but different numbers of neutrons. They differ in their atomic mass due to the varying number of neutrons.

8. Explain the concept of electron shells in an atom.

Electron shells are energy levels or orbits around the nucleus where electrons are found. Electrons fill these shells in a specific order, with the innermost shell closest to the nucleus.