

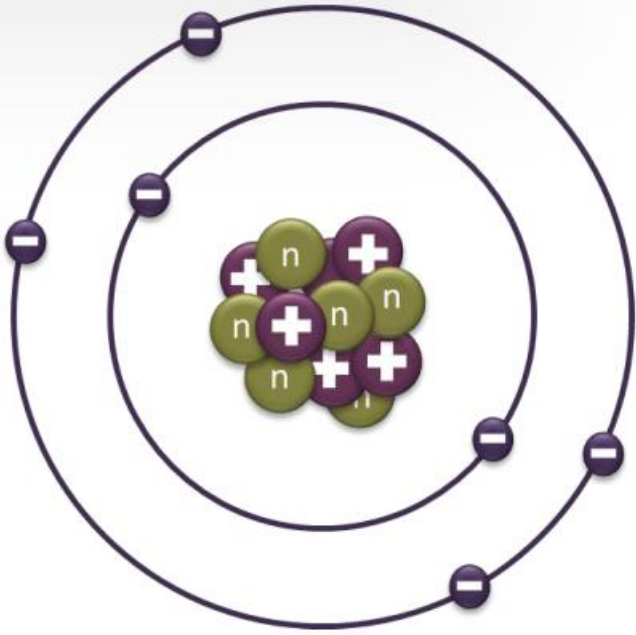
Module 5: Minerals
Topic 1 Content: Atomic Structure Notes

Introduction

Atomic Structure

Introduction

Atoms are composed of even smaller particles called protons, neutrons, and electrons. The atom shown in the image to the right is a carbon atom. In this activity, use the arrows in the lower right corner to learn about each of these particles.



The diagram illustrates a carbon atom. At the center is a nucleus composed of six purple spheres with a white plus sign (+) representing protons and six green spheres with a white 'n' representing neutrons. Surrounding the nucleus are two concentric circular orbits. The inner orbit contains two small purple spheres with a white minus sign (-) representing electrons. The outer orbit contains four small purple spheres with a white minus sign (-) representing electrons.

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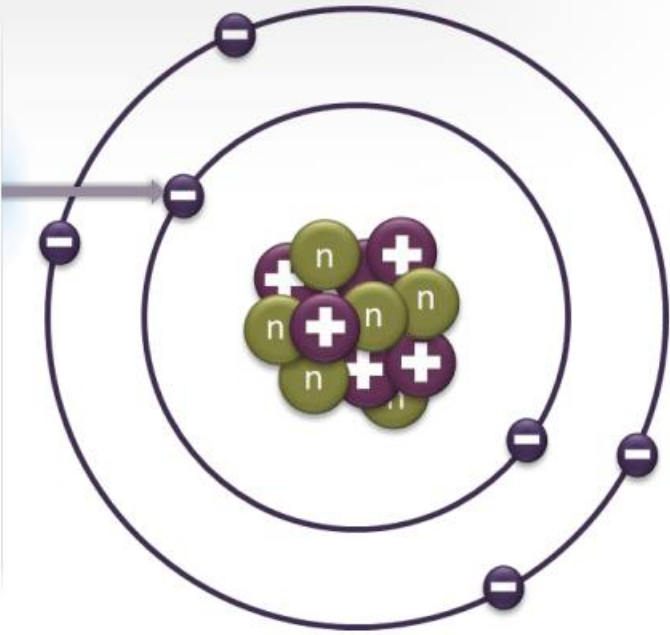
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Electron

Atomic Structure

Electron

An electron is a negatively-charged particle in an atom. Electrons orbit the nucleus of an atom on shells or electron orbitals. In a normal atom, the number of electrons equals the number of protons and the atom has a neutral charge. Electrons are much smaller than other atomic particles. Occasionally, atoms can lose or gain an electron to create a positively- or negatively-charged atom called an ion.



The diagram illustrates the structure of an atom. At the center is the nucleus, composed of several protons (represented by purple circles with a white plus sign) and neutrons (represented by green circles with a white 'n'). Surrounding the nucleus are two concentric circular orbits or shells. The inner shell contains two electrons (represented by purple circles with a white minus sign), and the outer shell contains six electrons. A grey arrow points from the text on the left towards one of the electrons in the inner shell.

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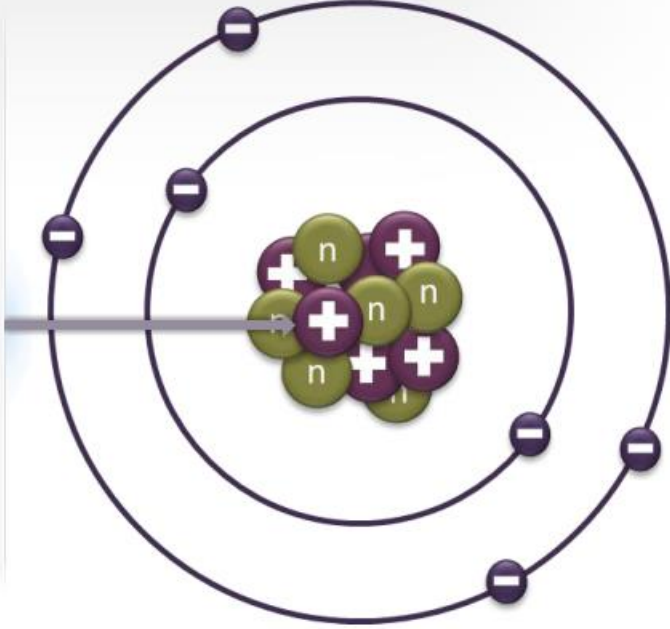
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Proton

Atomic Structure

Proton

A proton is a positively-charged particle in an atom. The number of protons in an atom determines which atom it is and its number on the periodic table of elements. Protons are located in the nucleus of an atom where most of the weight resides. The element carbon has six protons, so it has an atomic number of 6.



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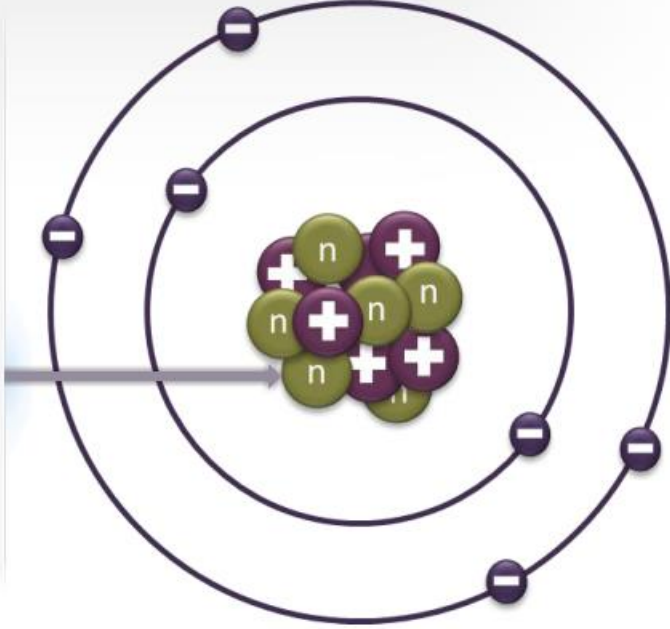
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Neutron

Atomic Structure

Neutron

A neutron is an uncharged particle found in the nucleus of the atom. Neutrons are slightly heavier than protons. To determine how many neutrons are contained in an atom, you will take the atomic weight of an atom and round it to the nearest whole number. Then, you subtract the number of protons. The number remaining is the number of neutrons in the atom. Changing the number of neutrons in an atom does not change the element; instead, it produces a heavier or lighter form of the atom called an isotope.



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