

Carbon is an element found on the Periodic Table that is essential for all life on earth. We can find carbon in everything from our food and clothes to our makeup and gasoline. The reason carbon is so important to life has to do with the number of electrons, or negatively-charged particles, in the element's outer electron shell. Elements normally aim for a full set of eight electrons to complete their outer shell; they get to this complete number by bonding with other elements and either stealing or sharing electrons with those elements. Since carbon needs four other electrons—exactly half—to complete its shell, it can bond with other elements in many unique ways compared to an element that only needs one or two electrons.

Carbon bonds are very strong, allowing them to form extremely large molecules that are essential in the building blocks of life. In fact, carbon forms more compounds than all the other elements combined, and nearly ten million different carbon compounds exist. Some of these compounds are part of minerals like magnetite, marble and limestone; many of them are organic and help make substances such as natural gas and plant and animal tissue. Crystalline forms of carbon include graphite, which is found in pencil lead, and diamonds.

Carbon's atomic number is six, so it has six protons, or, positively-charged particles, in its nucleus. The most common form of carbon is its carbon-12 isotope, which has six protons and six neutral-charged neutrons. The carbon-14 isotope, with six protons and eight neutrons, is used in the radioactive dating of organic materials.

The Carbon Cycle is an essential component of life on Earth. As part of this cycle, carbon is transported between Earth's atmosphere, oceans, and ecosystems. Carbon dioxide in the atmosphere is broken down into carbohydrates by plants, consumed by animals, broken down into carbon dioxide again, and returned to the atmosphere as a gas. Atmospheric carbon plays a large role in trapping harmful radiation and preventing it from striking planet earth, keeping us safe.

**1. What is another way for the first sentence to be written?**

- A. Carbon is an important element for life on Earth
- B. Carbon is sometimes important for life on Earth
- C. Most life forms depend on Carbon for survival
- D. Carbon is necessary for all life on Earth

**2. According to the passage, what is the difference between electrons and protons?**

- A. Electrons are positively charged and protons are neutral
- B. Electrons are positively charged and protons are negatively charged
- C. Electrons are located in a cell's nucleus and protons are located elsewhere
- D. Electrons are negatively charged and protons are positively charged

**3. Based on the passage, which of the following best describes the definition of atomic number?**

- A. The number of electrons in the nucleus of a cell of an element
- B. The number of protons in the nucleus of a cell of an element
- C. The number of neutrons in the nucleus of a cell of an element
- D. The number of negatively-charged particles in the nucleus of a cell of an element

**4. What is NOT defined?**

- A. isotope
- B. atomic number
- C. protons
- D. electrons

**5. What roles do plants play in the carbon cycle?**

- A. Plants consume carbon
- B. Plants turn carbon into carbohydrates
- C. Plants trap harmful radiation
- D. Plants play only a minor role in the carbon cycle

**6. What would happen if the carbon cycle did not exist?**

- A. People and animals would not have water
- B. People would not have the materials to build houses
- C. Harmful radiation would impact the Earth
- D. The periodic table would not exist

**7. What is NOT true about Carbon?**

- A. Carbon forms more compounds than all of the other elements combined

- B. The crystalline form of Carbon may include the elements that makes up the led in your pencil or diamonds
- C. Carbon-12 isotope can be used in the radioactive dating of organic materials
- D. Carbon has six positively-charged particles in its nucleus