

Inside Every Atom

Track the particles that give atoms their structure and charge.

6.5.a "atoms consist of particles, including electrons, protons, and neutrons;"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline every occurrence of the words protons, neutrons, and electrons. Circle every occurrence of only the words positive, negative, and neutral, including repeated uses, to track each particle's charge.

A Tiny Structure with Three Particles

- ① Every piece of matter, from a grain of salt to a bicycle frame, is made of atoms. An atom is extremely small, but it has smaller particles inside it. Three important particles are protons, neutrons, and electrons. Protons and neutrons are packed together in a tiny center called the nucleus. Electrons move in the space around the nucleus. This arrangement means that most of an atom's size is the region around the nucleus where electrons move.
- ② Each particle has a charge, which affects how particles interact. A proton has a positive charge. An electron has a negative charge that is equal in size to a proton's positive charge. A neutron is neutral, which means it has no charge. In an atom with the same number of protons and electrons, the positive and negative charges balance. The atom is neutral overall. Protons and neutrons have much more mass than electrons do, in comparison.
- ③ Scientists can identify an element by its number of protons. For example, a carbon atom always has six protons. A neutral carbon atom also has six electrons, so its charges balance. Carbon atoms can have six, seven, or eight neutrons. These versions have different masses but remain carbon because the proton count stays six. In every version, protons and neutrons fill the nucleus, and electrons occupy space around it within the atom.

2 ANSWER WITH EVIDENCE Use the passage

1 What three particles are found in atoms?

2 Where are protons and neutrons found? Where are electrons found?

3 State the charge of a proton, an electron, and a neutron.

4 Why does a neutral carbon atom have six electrons as well as six protons?

3 YOUR TURN Your own words

Create a made-up neutral atom model and give it a name. Write three sentences that state its numbers of protons, neutrons, and electrons, tell where the particles are found, and explain why the model is neutral.

PART 1 • READ AND MARK

Underline every occurrence of the words protons, neutrons, and electrons. Circle every occurrence of only the words positive, negative, and neutral, including repeated uses, to track each particle's charge. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What three particles are found in atoms?	Protons, neutrons, and electrons.
2	Where are protons and neutrons found? Where are electrons found?	Protons and neutrons are in the nucleus. Electrons move in the space around the nucleus.
3	State the charge of a proton, an electron, and a neutron.	A proton is positive, an electron is negative, and a neutron is neutral, or has no charge.
4	Why does a neutral carbon atom have six electrons as well as six protons?	It has equal numbers of positive protons and negative electrons, so the charges balance.

PART 3 • YOUR TURN (SAMPLE ANSWER)

My atom model, Luma, has 4 protons, 5 neutrons, and 4 electrons. Its protons have positive charge and its neutrons have no charge, and both are in the nucleus. Its electrons have negative charge and move around the nucleus, so Luma is neutral because it has equal numbers of protons and electrons.

Accept equivalent wording for particle locations and charges. For the open response, accept any particle counts if the model has equal numbers of protons and electrons and correctly places and describes all three particle types.