

Name: _____

Class: _____

4A The structure of the atom

Skill sharpener: Processing and analysing

Building atoms and ions

Follow the steps to complete the activity.

1. Open and set up the PhET simulation: [Build an atom.](#)

Website: https://phet.colorado.edu/sims/html/build-an-atom/latest/build-an-atom_all.html

2. Select the 'Atom' option.
3. Expand all the fields on the right (Net charge and Mass number).
4. Complete the table by adding protons, neutrons, and electrons to build each atom.

Atom	Neutrons	Electrons	Protons	Charge
Beryllium	5	4	4	
	5	5	4	
Boron	5			0
	6	6		
	10		10	+1

5. State the location of each subatomic particle in an atom.

a. neutron

b. proton

c. electron

6. Identify the particles contributing to

a. mass number

b. atomic number.

7. Identify the particles which contribute to the net charge and explain how each changes the net charge.

8. Build a neutral beryllium atom then add 2 protons to the nucleus.

a. State and explain why the net charge changed.

b. Explain why the element name changed to carbon.

Example answer

Question 4

Atom	Neutrons	Electrons	Protons	Charge
Beryllium	5	4	4	0
Beryllium	5	5	4	-1
Boron	5	5	5	0
Carbon	6	6	6	0
Neon	10	9	10	+1

Question 5a

the centre of the atom – the nucleus

Question 5b

the centre of the atom – the nucleus

Question 5c

around the nucleus – orbits or cloud

Question 6a

The number of neutrons and protons.

Question 6b

The number of protons.

Question 7

Electrons and protons contribute to the net charge of the atom.
If there are more electrons than protons, the net charge is negative.
If there are more protons than electrons, the net charge is positive.

Question 8a

The new net charge is +2 because there are 2 more protons than electrons.

Question 8b

The number of protons determines the atomic number of an element and defines its identity. By adding 2 protons to the nucleus of beryllium, the number of protons changes to 6, which is the atomic number for carbon. Thus, the element name changed to carbon.