



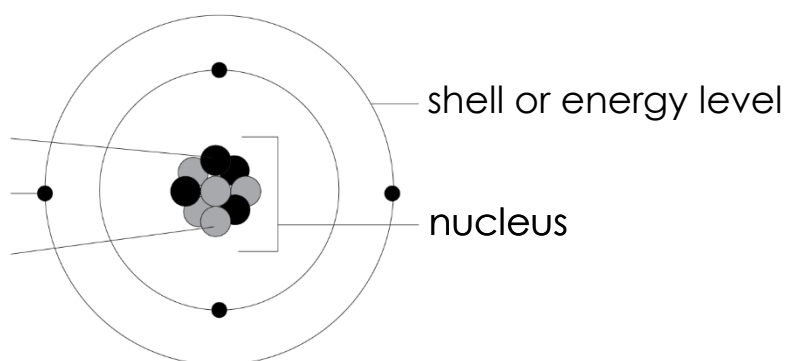
Structure of the atom: knowledge check

- 1.1 Label the subatomic particles on this diagram of an atom using the key words provided.

protons

electrons

neutrons



- 1.2 Use the words to complete the sentences. Words can be used more than once.

nucleus

shells

protons

electrons

neutrons

The positive _____ are found inside the _____.

The neutral _____ are found inside the _____.

The negative _____ are found in the _____.

- 1.3 Complete the table using the information from question 1.2.

Name of subatomic particle	Charge	Relative mass	Location
proton		1	
neutron		1	
electron		negligible (0.0005)	



- 1.4 The periodic table contains enough information to allow us to work out the numbers of subatomic particles in each atom of the elements. Complete the diagram by filling in the gaps. Words can be used more than once.

	atomic number	mass number	protons	neutrons
Name of number				
			Subatomic particles	

_____ number

_____ number

B

Boron

5

11

_____ and

- 1.5 A neutral atom will have the same number of protons and electrons. Complete the number of protons, neutrons and electrons in each element below. The first one is done for you.

F

Fluorine

9

19

Al

Aluminium

13

27

K

Potassium

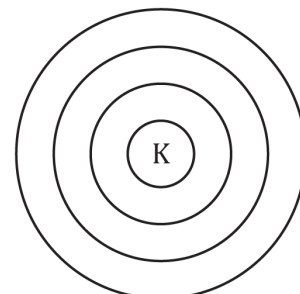
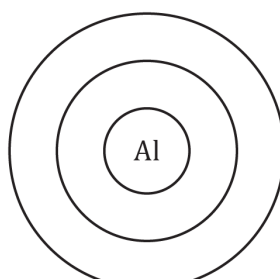
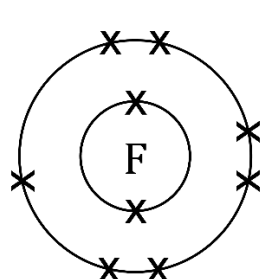
19

39

protons:	9	_____	_____
neutrons:	$19 - 9 = 10$	$27 - 13 =$ _____	_____
electrons:	9	_____	_____

- 1.6 Use the information from question 1.5 to add the electrons to the diagrams below and write the electron configuration for each atom. The first one is done for you.

Hint: For the first twenty elements in the periodic table there are two electrons in the first shell and eight electrons in the second and third shells.



Electron configuration: 2, 7

2, _____, _____
Hint: 13 electrons

2, _____, _____, _____
Hint: 19 electrons



Structure of the atom: test myself

2.1 Draw a line to match the subatomic particle to its charge:

proton

negative

neutron

positive

electron

neutral

2.2 Draw a line to match the subatomic particle to where it is found:

proton

shells

neutron

nucleus

electron

2.3 State which subatomic particle can be found by knowing the atomic number of an atom.

Subatomic particle described by atomic number = _____

2.4 State which subatomic particles are described by the mass number of an atom.

Hint: what particles are in the nucleus?

Subatomic particles described by mass number = _____ and _____

2.5 This is information from the periodic table for element X. Give:

X	
30	65

the atomic number = _____

the mass number = _____

2.6 Using the information given, complete the number of protons, neutrons and electrons in boron:

B	
Boron	
5	11

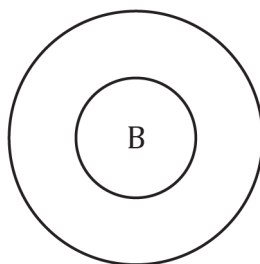
protons = _____

neutrons = _____

electrons = _____



- 2.7 Using the information from Q2.6, add the electrons to the shells in this diagram of boron.



- 2.8 Using the information from Q2.7, write the electron configuration for boron.

Electron configuration: 2 , _____

- 2.9 A neutral atom has 20 protons. Determine the number of electrons it has. Complete the sentences to explain your answer.

Number of electrons = _____

opposite **positive** **neutrons** **masses** **equal**
neutral **electrons** **negative** **charges** **protons**

Protons have a _____ charge. If an atom has 20 protons then it will need to have an _____ number of electrons in order to be _____ overall. This is because the _____ have an equal and opposite _____ charge to the positive protons. The opposite _____ cancel out to give a neutral atom.

- 2.10 A student stated: 'mass is concentrated in the nucleus of the atom'. Do you agree or disagree? Complete the sentences to explain your answer.

charge **agree** **nucleus** **protons** **small** **disagree**
atom **large** **empty space** **neutrons** **mass** **electrons**

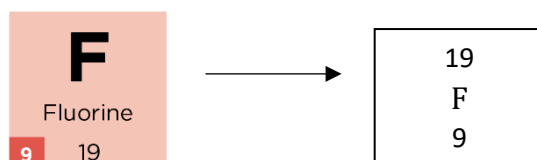
I _____ with the student because protons and _____, which are located in the nucleus, each have a relative _____ of one. Electrons, which orbit the nucleus, have a mass that is so _____ it is considered to be negligible when calculating the mass of an _____. The majority of an atom is _____.



Structure of the atom: feeling confident?

- 3.1 Using a periodic table, complete the information about the number of subatomic particles in the atoms below. Add the electron configuration for the elements indicated. The first one is completed for you.

For the purposes of this table elements are written as follows:



Element	Atomic Number	Mass number	Protons	Electrons Same as protons	Neutrons Mass number – atomic number	Electron configuration
1 H 1	1	1	1	1	1 – 1 = 0	1,0
9 Be 4	4	9				2,___
14 N 7		14	7		7	
24 Mg 12	12	Protons + neutrons =		12	24 – 12 =	2,8,___
31 P 15	15		15		16	2,8,5
56 Fe 26		56	26			
108 Ag 47	47		47		61	
208 Pb 82		208		82		
202 Hg 80	Same as protons =		80		122	



Structure of the atom: what do I understand?

Think about your answers and confidence level for each mini-topic. Decide whether you understand it well, are unsure, or need more help. Tick the appropriate column.

Mini-topic	I understand this well	I think I understand this	I need more help
I can name the subatomic particles.			
I can describe the following properties of the subatomic particles: <ul style="list-style-type: none"> • charge • relative mass • where they are found 			
I know which particles are described by the: <ul style="list-style-type: none"> • atomic number • mass number 			
I can use information from the periodic table to work out the number of protons, neutrons and electrons for a neutral atom.			
I draw the correct number of electrons on the shells of an atom for elements 1–20 on the periodic table.			
I can write the electron configuration for an atom of elements 1–20, if I know the number of electrons.			
Feeling confident? topics	I understand this well	I think I understand this	I need more help
I can use the periodic table to work out the number of subatomic particles for any element.			