

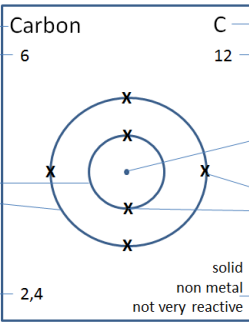
Patterns on the Periodic Table

This task is about recognising patterns on the periodic table.

Dmitri Mendeleev was a Russian chemist who is credited with the invention of the periodic table. [Learn more about Mendeleev here]



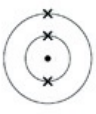
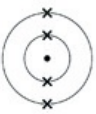
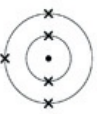
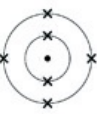
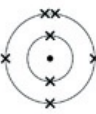
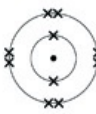
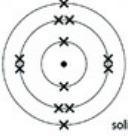
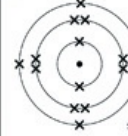
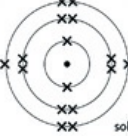
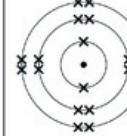
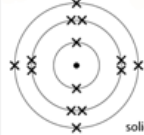
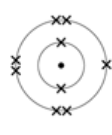
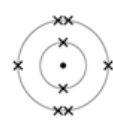
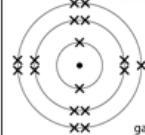
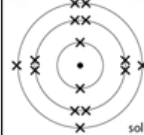
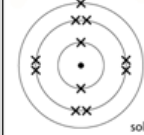
For this exercise you will be using information on element cards such as the one below to make conclusions about patterns in elements on the periodic table - very much like Mendeleev did back in the mid 1800s.

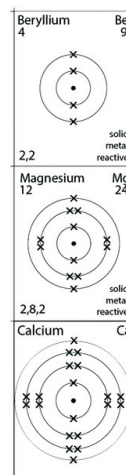
Element "cards"

element name	Carbon	C	symbol
atomic number	6	12	atomic mass
			nucleus
shells (aka energy levels)			electrons
electron configuration	2,4	solid non metal not very reactive	properties

The numbers under each atom show the way the electrons are arranged for that element. This is called the **electron configuration**. The electron configuration of carbon is 2,4. This means there are 2 electrons in the first energy level and 4 electrons in the second energy level.

a) Look closely for patterns in the periodic table. Drag and drop the elements below to where they belong in the table.

Periodic Table of Elements									
Hydrogen H  gas non metal very reactive									Helium He  gas non metal very unreactive
Lithium Li  solid metal very reactive	Beryllium Be  solid metal reactive	Boron B  solid non metal not very reactive	Carbon C  solid non metal not very reactive	Nitrogen N  gas non metal not very reactive					Neon Ne  gas non metal very unreactive
		Magnesium Mg  solid metal reactive	Aluminium Al  solid metal reactive				Sulphur S  solid non metal reactive	Argon Ar  gas non metal very unreactive	
Silicon Si  solid non metal not very reactive	Fluorine F  gas non metal extremely reactive	Oxygen O  gas non metal reactive	Chlorine Cl  gas non metal very reactive	Phosphorus P  solid metal reactive	Sodium Na  solid metal very reactive				



Here are the first three elements in the **second column** of the periodic table.

b) Complete the following statements by choosing an option from the drop-down box or writing your answer in the space provided.

- i) As you go down each **column** (or group) of the periodic table the number of electrons in the outer shell *increases/ decreases/ stays the same* and the number of shells *increases/ decreases/ stays the same*
- ii) The element calcium is found immediately below magnesium on the periodic table. What is calcium's atomic number?
- iii) What is calcium's electron configuration?
- iv) Use the pattern you can see in the properties of the elements in a column to predict the properties of calcium.
I predict calcium will have the following properties: It will be *gas/ liquid/ solid* at room temperature, it will be a *metal/ non metal*, and it will be *very reactive/ reactive/ not very reactive*

Here are the first 5 elements of the second row of the periodic table.

<p>Lithium 3</p> <p>2,1</p> <p>solid metal very reactive</p>	<p>Li 7</p> <p>Beryllium 4</p> <p>2,2</p> <p>solid metal reactive</p>	<p>Be 9</p> <p>Boron 5</p> <p>2,3</p> <p>solid non metal not very reactive</p>	<p>B 6</p> <p>Carbon 6</p> <p>2,4</p> <p>solid non metal not very reactive</p>	<p>C 12</p> <p>Nitrogen 7</p> <p>2,5</p> <p>gas non metal not very reactive</p>
--	---	--	--	---

c) Complete the following statements by choosing an option from the drop-down box or writing your answer in the space provided.

As you go across each **row** of the periodic table the number of electrons in the outer shell

i) *increases/ decreases/ stays the same* and the number of shells
increases/ decreases/ stays the same

ii) The atomic number of nitrogen is

iii) Look at the pattern in atomic masses and use it to suggest what the atomic mass of boron might be

iv) Type in the electron configuration for nitrogen