Electronic structure and the periodic table

Task 1: Introduction to the periodic table

A section of the periodic table is shown. 7 elements are shown.

																	He
Li																F	
												Al					
K				V									Ge				

i) **Which** element is in Period 3?

ii) **Which** element is in Group 7?

iii) **Which** element is in Group 0?

iv) **Which two** elements are non-metals?

v) **Which** element is a transition metal?

vi) **Give** two elements that are in the same group.

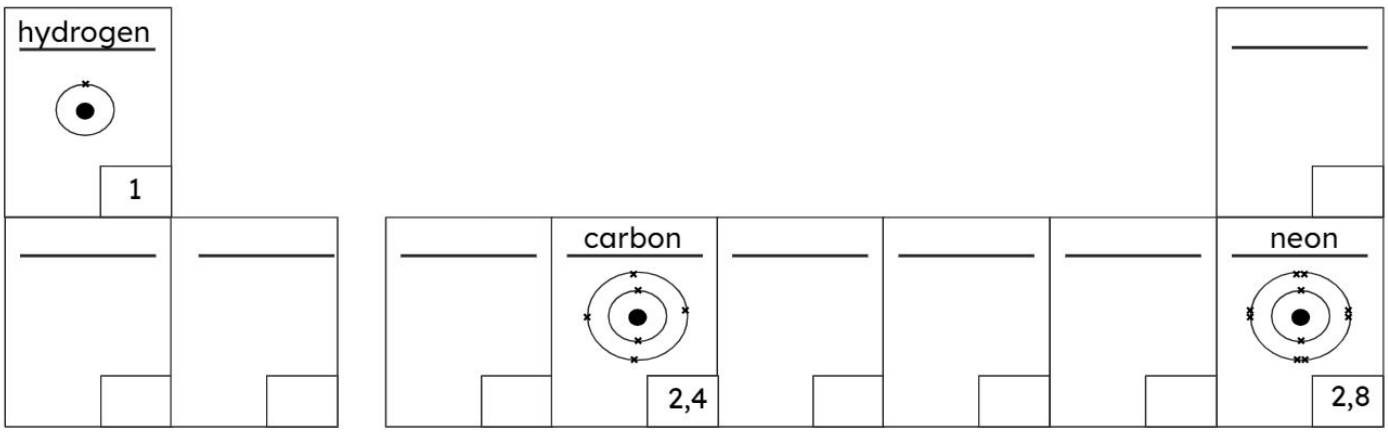
vii) Give **three** elements that are in the same period.

viii) Give one element that will conduct electricity.

viiii) **Which two** elements differ by one proton?

Task 2: Electronic structure

a) **Complete** the electronic structures for the first 10 elements.



b) **What** is the electron pattern across the periods?

Task 3: Linking electronic structure and the periodic table

a) **Fill** the blanks.

Elements that are in the same _____ have the same number of electrons in their _____ shell.

Elements in the same period have the same number of _____. The most stable atoms have a _____ outer shell. Chemical reactions take place so elements can complete their outer shell by forming chemical _____.

b) **Complete** the table.

Element	**Number of electrons**	**Electronic structure**	**Number of shells**	**Number of outer electrons**	**Group number**	**Period number**
calcium						
silicon						
oxygen						
chlorine						
neon						
potassium						

Electronic structure and the periodic table

Answers

Task 1: Introduction to the periodic table

A section of the periodic table is shown. 7 elements are shown.

																	He
Li																F	
												Al					
K				V									Ge				

i) **Which** element is in Period 3? *Al*

ii) **Which** element is in Group 7? *F*

iii) **Which** element is in Group 0? *He*

iv) **Which two** elements are non-metals? *He, F*

v) **Which** element is a transition metal? *V*

vi) **Give** two elements that are in the same group. *Li and K*

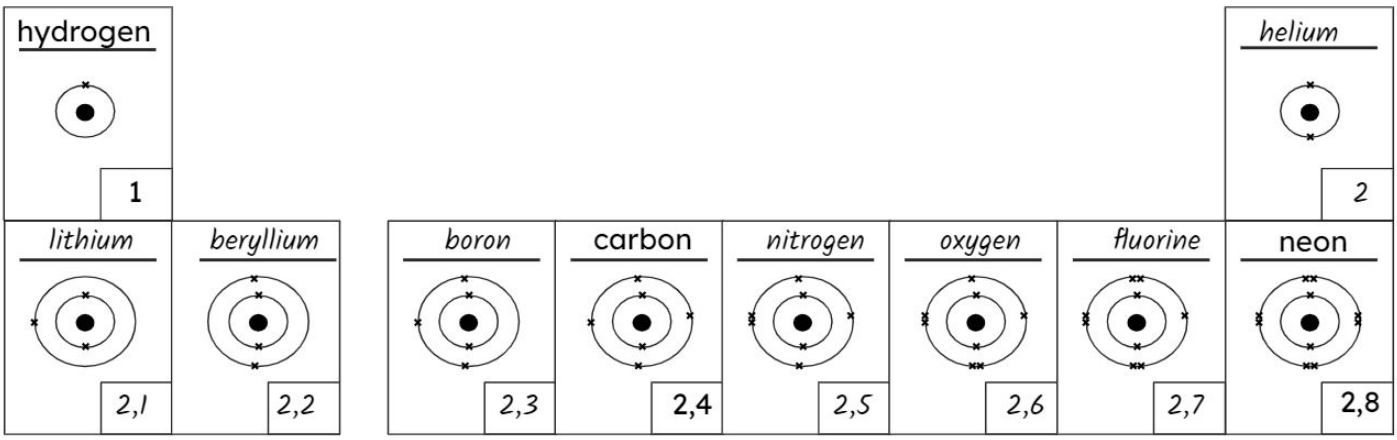
vii) Give **three** elements that are in the same period. *K, V, Ge*

viii) Give one element that will conduct electricity. *Li, K, V, Al, Ge*

viiii) **Which two** elements differ by one proton? *He and Li*

Task 2: Electronic structure

a) **Complete** the electronic structures for the first 10 elements.



b) **What** is the electron pattern across the periods?

As you go across the periods, one electron is added each time.

Answers

Task 3: Linking electronic structure and the periodic table

a) **Fill** the blanks.

Elements that are in the same group have the same number of electrons in their outer shell.

Elements in the same period have the same number of shells. The most stable atoms have a full outer shell. Chemical reactions take place so elements can complete their outer shell by forming chemical bonds.

b) **Complete** the table.

Element	Number of electrons	Electronic structure	Number of shells	Number of outer electrons	Group number	Period number
calcium	20	2,8,8,2	4	2	2	4
silicon	13	2,8,4	3	4	4	3
oxygen	8	2,6	2	6	6	2
chlorine	17	2,7	2	7	7	3
neon	10	2,8	2	8	0	2
potassium	19	2,8,8,1	4	1	1	3