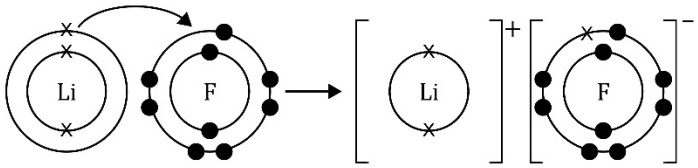
Bonding: knowledge check

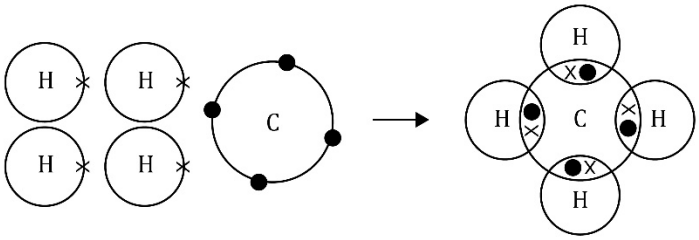
1.1 Use the words to complete the sentences:

covalent bonding **ionic bonding** **metallic bonding**

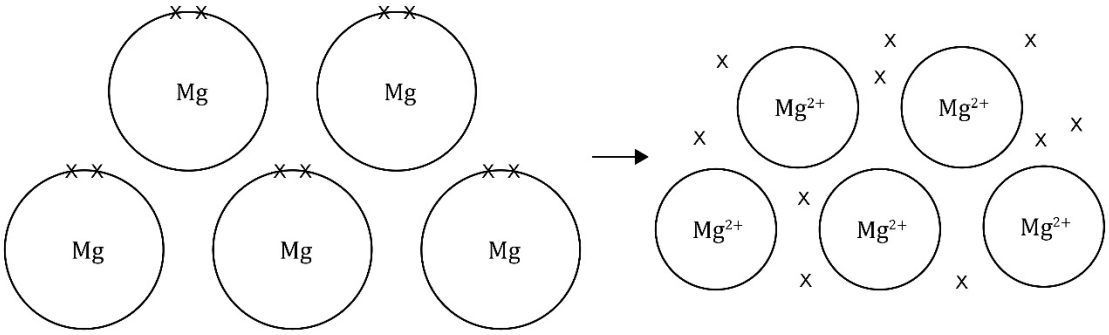
A.



B.



C.



(a) The type of bonding in figure A is _____.

(b) The type of bonding in figure B is _____.

(c) The type of bonding in figure C is _____.

1.2 Use the words to complete the sentences.

electrostatic forces **ionic** **negatively**

non-metal **transferred**

_____ bonding – this bond is formed when electrons are _____ from a metal atom to a _____ atom, forming positively charged ions and _____ charged ions. Strong _____ attract the oppositely charged ions to each other.

1.3 Use the words to complete the sentences. You can use words more than once.

covalent **electron** **electrons**

outer **non-metal**

_____ bonding – this bonding occurs between _____ atoms. In a single covalent bond, a pair of _____ is shared between two atoms. These shared electrons are found in the _____ shells of the atoms. Each atom contributes one _____ to the shared pair of electrons.

1.4 Use the words to complete the sentences. You can use words more than once.

electrons **electrostatic forces** **ions** **metallic**

_____ bonding – the electrons leave the outer shells of metal atoms, forming positive metal ions and a 'sea' of delocalised _____ that are free to move. This bond is the result of the strong _____ of attraction between the positive metal _____ and the negative delocalised _____.

Bonding: test myself

Use the words to complete the sentences. You can use the words more than once.

2.1 What types of elements are involved in the following bonds?

metals and non-metals **metals only** **non-metals only**

(a) ionic bonding _____.

(b) covalent bonding _____.

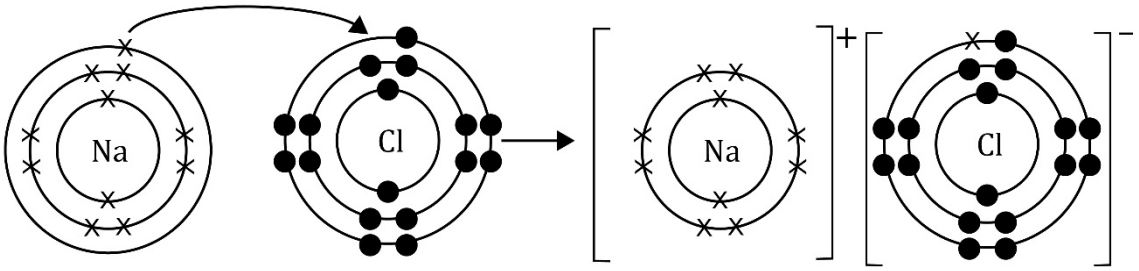
(c) metallic bonding _____.

2.2 In which type of bonding are electrons shared?

covalent **ionic** **metallic**

Electrons are shared in _____ bonding.

2.3 What does the curved arrow represent in this diagram?



atom **electron** **ion** **shared** **transferred**

The arrow represents an _____ being

_____ from one atom to another.

2.4 What type of forces hold the particles together in an ionic bond?

covalent forces **electrostatic forces** **ionic forces**

_____ of attraction hold the particles together

in an ionic bond.

2.5 What does 'delocalised' mean?

allowed **easy** **free** **produced**

Delocalised means that the electrons are _____ to move around.

2.6 What are the charged particles called in an ionic compound?

electrons **ions** **atoms** **protons**

The charged particles in an ionic compound are called _____.

2.7 What type of bonds do you find in a compound?

covalent **electronic** **ionic** **metallic**

The bonds in a compound can be either _____ or _____.

2.8 Why are metals good conductors of electricity?

delocalised **electrons** **ions** **metallic** **move**

Metals are good conductors of electricity because they contain _____ _____ that are free to _____ and carry the charge.

2.9 How do ionic compounds conduct electricity when solid, liquid and in solution? Explain your answer.

gas **ions** **liquid** **move**

solid **solution**

Ionic compounds cannot conduct electricity when they are in the

_____ state because the ions are not free to move.

They can conduct electricity when they are in a _____

or when they are _____ because the

_____ can _____ and carry the

charge.

2.10 Why are most covalent substances non-conductors of electricity?

atoms **charge** **charged**

electrons **ions**

Most covalent compounds do not conduct electricity because they do not

have _____ particles (_____

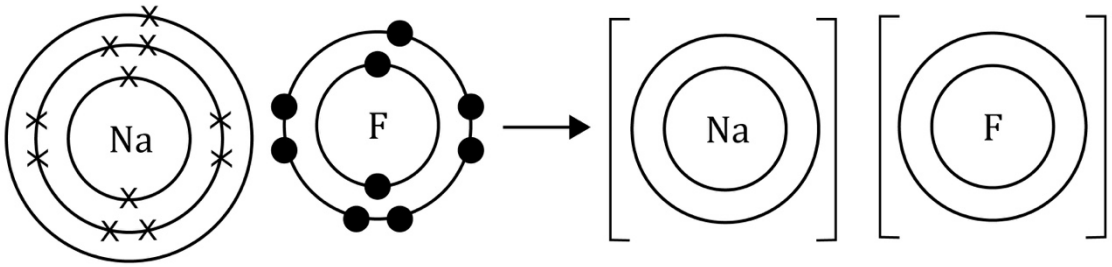
or _____) that can move and carry the

_____.

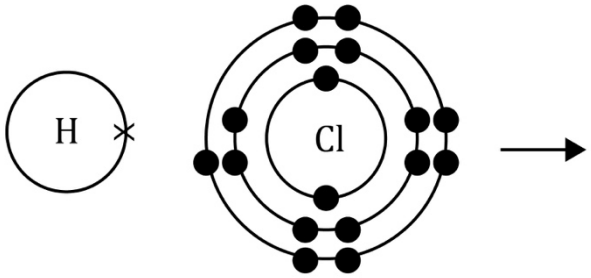
Bonding: feeling confident?

For questions 3.1 and 3.2, complete the bonding diagrams.

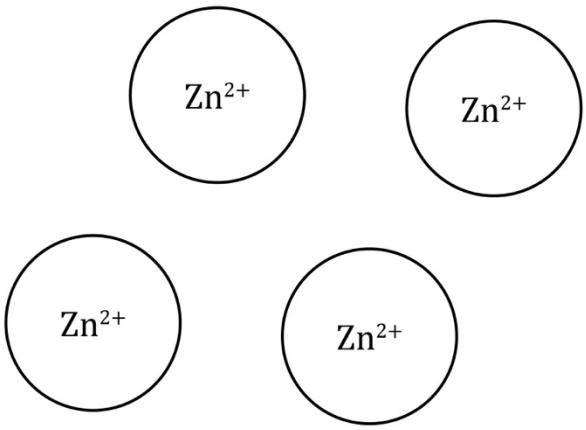
3.1 The reaction between sodium and fluorine.



3.2 The reaction between hydrogen and chlorine.



3.3 Add electrons to the diagram to show the metallic bonding in zinc.



Bonding: 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 identify ionic, covalent and metallic bonds from diagrams.			
I know that there are ions in ionic bonds.			
I know about electrostatic forces in ionic bonds.			
I know that electrons are shared in covalent bonds.			
I know that there are positive metal ions and negative delocalised electrons in metallic bonds.			
I know the types of elements involved in: • ionic bonds • covalent bonds • metallic bonds.			
I can explain why metals conduct electricity.			
I can explain the conditions required for ionic compounds to conduct electricity.			
I can explain why covalent substances do not conduct electricity.			
Feeling confident? topics	**I understand this well**	**I think I understand this**	**I need more help**
I can draw diagrams to represent ionic and covalent bonds.			