

**WEEK: 19**

**Week Beginning: 27-7-20**

**Subject: SCIENCE**

**Year: 9**

### **Lesson Objective:**

- Go over homework
- Covalent bonding

### **Keywords/ Concepts**

- Non-metals, electrostatic forces, intermolecular forces, electrons

### **Class Worksheets**

- Questions below

### **Homework**

- Questions

### **Additional Notes**

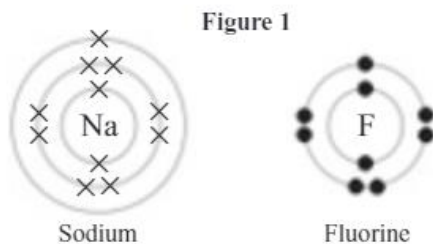
- Attach all the classroom worksheets and homework worksheets to this lesson plan and email together.
- Assume the students don't have revision guides and workbooks. Attach all the pages you want them to have.

# Homework from last week

## Exam Questions

- 1 Figure 1 shows the electronic structures of sodium and fluorine.

4-6



- 1.1 Describe what will happen when sodium and fluorine react, in terms of electrons.

[2 marks]

- 1.2 When sodium and fluorine react they form an ionic compound. Describe the structure of an ionic compound

[3 marks]

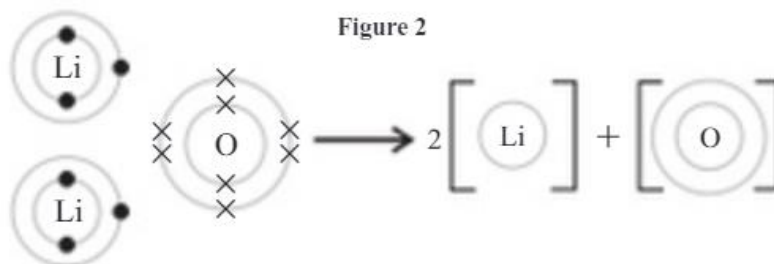
- 2 When lithium reacts with oxygen it forms the ionic compound  $\text{Li}_2\text{O}$ .

6-7

- 2.1 Name the compound formed.

[1 mark]

- 2.2 Complete Figure 2 below using arrows to show how the electrons are transferred when  $\text{Li}_2\text{O}$  is formed. Show the electron arrangements and the charges on the ions formed.



[3 marks]

- 2.3 Explain why  $\text{Li}_2\text{O}$  conducts electricity when molten.

[2 marks]

- 2.4 Lithium forms an ionic compound with chlorine. What is the formula of this compound? Explain why this is.

[2 marks]

## Classwork

1. What is a covalent bond?
2. How many covalent bonds does a molecule of nitrogen have?
3. In which states are most molecular substances at room temperature?
4. What bonds are forces are stronger in simple molecular structures; intermolecular forces or electrostatic forces?
5. What forces need to be overcome in order to boil a simple molecular substance?

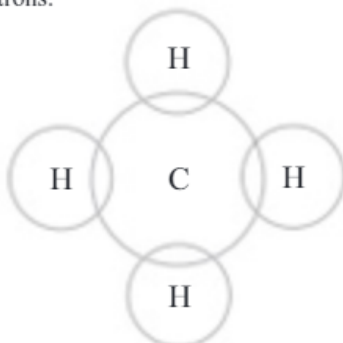
## Homework

### Exam Questions

- 1 Methane is a covalently bonded molecule with the formula  $\text{CH}_4$ .

4-6

Complete the dot and cross diagram for the methane molecule.  
Show only the outer electrons.



[2 marks]

- 2 Dot and cross diagrams can be used to show the position of electrons in covalent molecules.

4-6

- 2.1 Draw a dot and cross diagram for oxygen ( $\text{O}_2$ ). Only show the outer electrons.

[2 marks]

- 2.2 Nitrogen is in Group 5 of the periodic table.

How many bonds does it need to make to gain a full outer shell?

[1 mark]

- 3 Hydrogen chloride is a simple molecular substance.

6-7

- 3.1 Explain why hydrogen chloride has poor electrical conductivity.

[1 mark]

- 3.2 Explain how the atoms are held together in a molecule of hydrogen chloride.

[2 marks]

- 3.3 A molecule of hydrogen chloride has a stronger bond than a molecule of chlorine ( $\text{Cl}_2$ ).

However, hydrogen chloride boils at  $-85^\circ\text{C}$ , whereas chlorine boils at  $-34^\circ\text{C}$ .

Suggest and explain why chlorine has a higher boiling point than hydrogen chloride.

[3 marks]

Topic 2 — Bonding, Structure and Properties of Matter