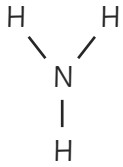
Building and Drawing

For each simple molecule, follow the headings in the table to firstly identify the elements present, then locate them on the periodic table to know the electronic configuration, build it using the molecular model kit, and finally draw the covalent bond in different ways.

Name and Formula of Simple Molecule	Location(s) of Element(s) on the Periodic Table	Build it Using the Molecular Model Kit and Draw the 3D Model	Draw a Dot and Cross Diagram	Draw the Displayed Formula (With straight lines!)
hydrogen (H_2)				H - H
chlorine (Cl_2)				
oxygen (O_2)				O = O
water (H_2O)				

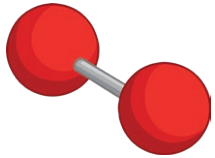
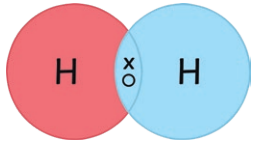
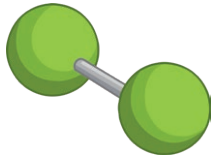
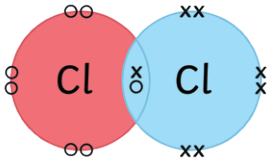
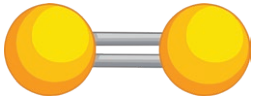
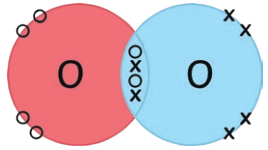
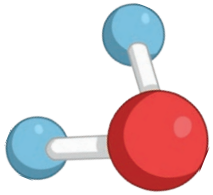
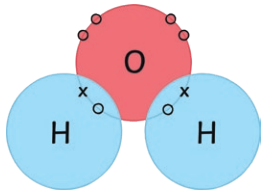
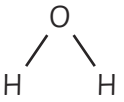
methane (CH_4)				
ammonia (NH_3)				

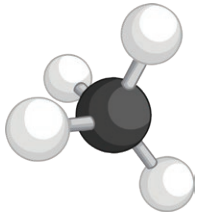
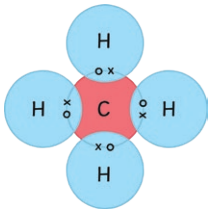
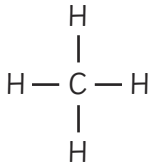
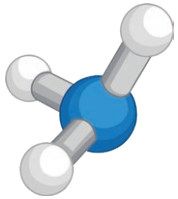
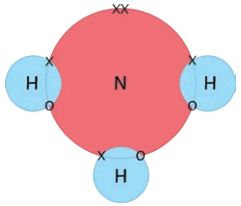
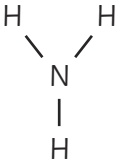
Challenge 1: What is the advantage of drawing a dot and cross diagram of a simple molecule compared to a 3D model or displayed formula?

Challenge 2: Can you think of disadvantages of using a dot and cross diagram?

Building and Drawing Answers

For each simple molecule, follow the headings in the table to firstly identify the elements present, then locate them on the periodic table to know the electronic configuration, build it using the molecular model kit, and finally draw the covalent bond in different ways.

Name and Formula of Simple Molecule	Location(s) of Element(s) on the Periodic Table	Build it Using the Molecular Model Kit and Draw the 3D Model	Draw a Dot and Cross Diagram	Draw the Displayed Formula (With straight lines!)
hydrogen (H_2)	Hydrogen is in group 1 (but does **not** share the characteristics of group 1 alkali metals).			H - H
chlorine (Cl_2)	group 7			Cl – Cl
oxygen (O_2)	group 6			O = O
water (H_2O)	Hydrogen is in group 1. Oxygen is in group 6.			

methane (CH_4)	Carbon is in group 4. Hydrogen is in group 1.			
ammonia (NH_3)	Nitrogen is in group 5. Hydrogen is in group 1.			

Challenge 1: What is the advantage of drawing a dot and cross diagram of a simple molecule compared to a 3D model or displayed formula?

Shows the electrons, how many of them there are, and which atoms are involved in the covalent bond.

Challenge 2: Can you think of disadvantages of using a dot and cross diagram?

Does not show the relative size of the atoms or how they are arranged spatially.