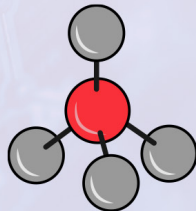
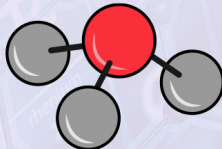
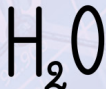
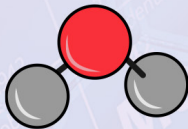


- The shape of covalent molecular compounds can be worked out using a theory called **V**alence **S**hell **E**lectron **R**epulsion **T**heory (VSEPR).
- It states that **regions of electron density** will be 'oriented' in space so that they are as far away from each other as possible (to minimise interaction / repulsion).
- **Regions of electron density** = bonds! OR unpaired electrons.



### Syllabus statement:

- \* investigate the differences between ionic and covalent compounds through:
  - modelling the shapes of molecular substances

Video in course  
9.5

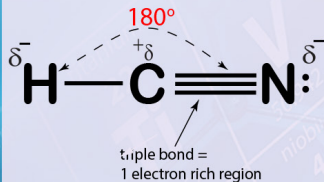
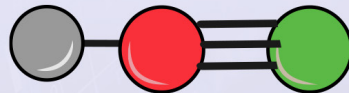
# MODULE 1 COVALENT COMPOUNDS

## MOLECULAR SHAPE

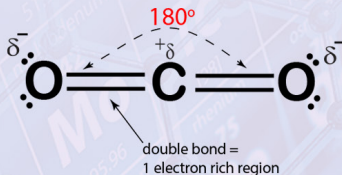
© The Flipped Teacher 2020

### TWO Regions of Electron Density

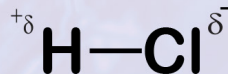
- If the central atom has TWO regions of electron density, they arrange in opposite directions 180° apart.
- This is called a **linear molecular geometry**.



Hydrogen cyanide



Carbon dioxide



Hydrogen chloride

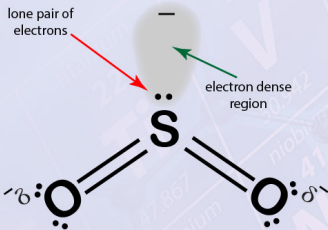
#### Syllabus statement:

- \* investigate the differences between ionic and covalent compounds through:
  - modelling the shapes of molecular substances

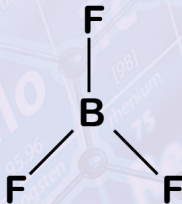
Video in course  
9.6

## THREE Regions of Electron Density

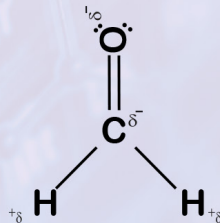
- If the central atom has **THREE** regions of electron density, they arrange at each corner of a triangle
- This is called a **trigonal planar molecular geometry**.



sulfur dioxide



Boron trifluoride



Formaldehyde

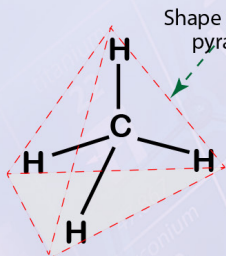
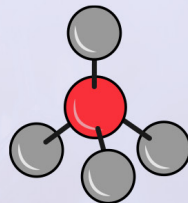
### Syllabus statement:

- \* investigate the differences between ionic and covalent compounds through:
  - modelling the shapes of molecular substances

Video in course  
9.7

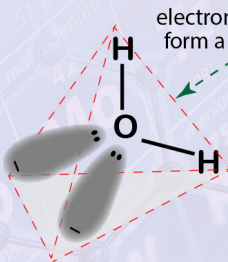
### FOUR Regions of Electron Density

- If the central atom has FOUR regions of electron density, they arrange at each corner of a Pyramid.
- This is called a **tetrahedral molecular geometry**.



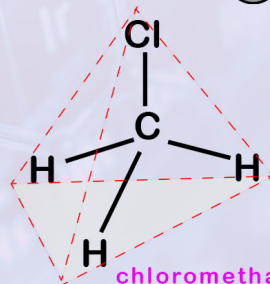
methane

Shape is like a pyramid



water

electron regions form a pyramid



chloromethane

#### Syllabus statement:

- \* investigate the differences between ionic and covalent compounds through:
  - modelling the shapes of molecular substances

Video in course  
9.8