

Lewis structures

Draw the bonds, add the lone pairs, name the shape.



NAME _____ CLASS _____ DATE _____

LEARNING GOAL

Draw Lewis structures of small molecules, name their shapes and say which forces act between molecules.

SUCCESS CRITERIA

- ☐ I can add up valence electrons.
- ☐ I can draw bonds and lone pairs so every atom is full.
- ☐ I can name a shape and a force.

ENTRY 1

Draw a Lewis structure

- 1 Add up the **valence electrons** of all the atoms.
- 2 Join the atoms with single bonds. Draw each bond as a line.
- 3 Give each atom its lone pairs, drawn as two dots, until it is full.
- 4 Count. Every atom is full (hydrogen 2, others 8) and the total is right. If an atom is short, share a lone pair as a second bond.

NOTES TO SELF

VALENCE ELECTRONS

Each atom brings its own number.

$\equiv$ H 1	$\equiv$ C 4
$\equiv$ N 5	$\equiv$ O 6
$\equiv$ Cl 7	

READING IT

A **line** is a bond: two shared electrons. A **pair of dots** is a lone pair.

ENTRY 2

Two finished models

Study them



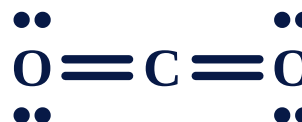
8

ELECTRONS

2 bonds + 2 lone pairs

Shape: **bent**

Bond angle: **about 105°**



16

ELECTRONS

2 double bonds + 4 lone pairs

Shape: **linear**

Bond angle: **180°**

ENTRY 3

Shapes key

Use it on page 2

LINEAR



Bond angle
180°

BENT



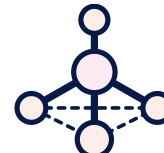
Bond angle
about 105°

TRIGONAL PYRAMIDAL



Bond angle
about 107°

TETRAHEDRAL



Bond angle
about 109.5°

Shapes and forces



NAME _____

CLASS _____ DATE _____

ENTRY 1

Draw CH₄

Atoms: 1 C, 4 H

DRAW HERE

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Total valence electrons

Shape

Bond angle: about

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ENTRY 3

Match the force

Strongest named interaction

MOLECULE

A H₂OB CH₄C NH₃D CO₂

In pure condensed samples; all also have dispersion.

1 London (dispersion) forces

2 hydrogen bonds

ENTRY 4

Explain

3 marks

Why is water a liquid at room temperature but methane a gas?

Use: ≡ HYDROGEN BONDS ≡ STRONGER ≡ MORE ENERGY
