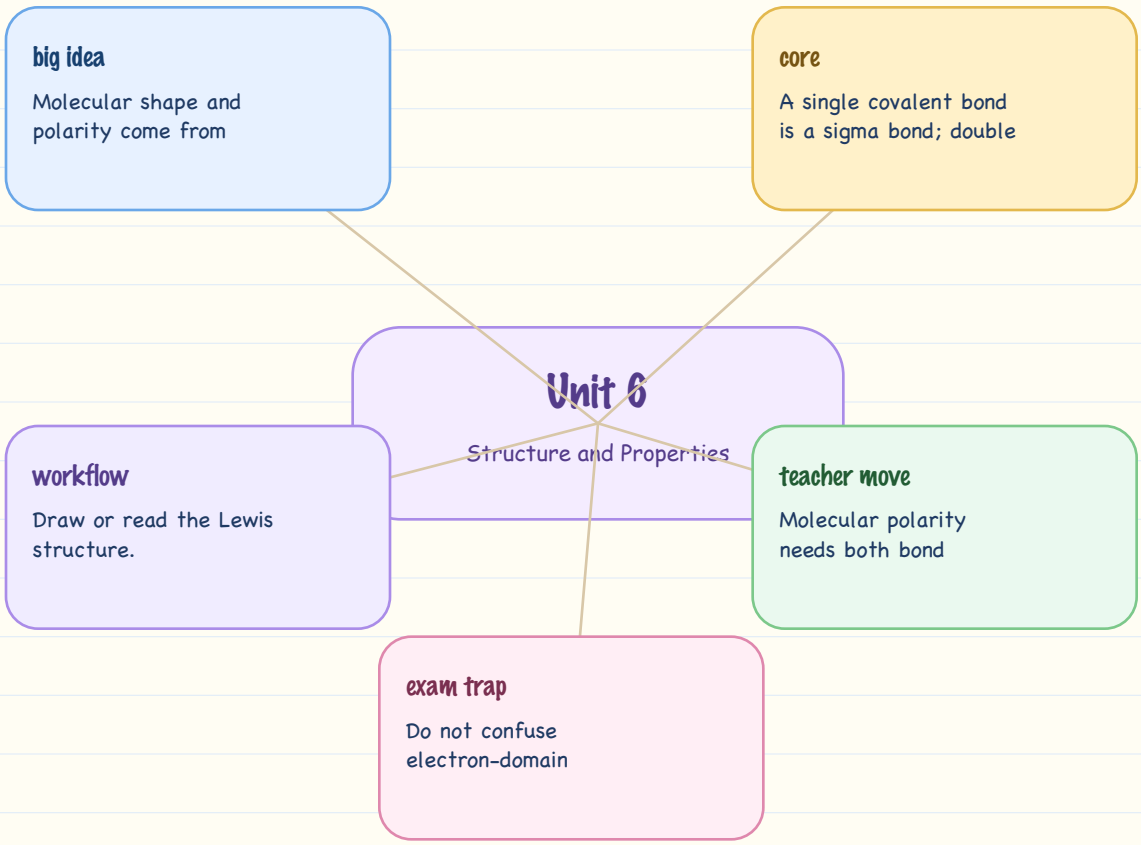
## Unit 6 Visual Notebook

# Molecular Structure and Intermolecular Forces

**DISTILLED FROM VIDEO**

9 lessons, P160-P168. Diagrams summarize the same source-locked workflows.



# Visual Strategy

| | | |
|---|---|---|
| 2 domains | linear | sp |
| 3 domains | trigonal planar | $sp^2$ |
| 4 domains | tetrahedral | $sp^3$ |
| 4 with lone pairs | bent / pyramidal | $sp^3$ |

### Teacher routine

- Count electron domains before naming shape.
- Separate electron-domain geometry from molecular shape.
- Polarity needs both bond polarity and shape.

# Cornell Notes

cue

Core idea

## Core idea

- A single covalent bond is a sigma bond; double and triple bonds add pi bonds.
- Bond length, bond energy, and bond angle describe bond strength and geometry.
- VSEPR uses electron domains and lone pairs to predict molecular shape.

cue

Workflow

## Workflow

- Draw or read the Lewis structure.
- Count electron domains around the central atom.
- Use VSEPR to predict electron-domain geometry and molecular shape.
- Assign hybridization from the domain count.

cue

Teacher moves

## Teacher moves

- Molecular polarity needs both bond polarity and molecular shape.
- Assign hybridization from electron-domain count: sp, $sp^2$, $sp^3$.
- Use VSEPR by counting electron domains before naming the shape.
- Connect bonding type to electron transfer or sharing.

# Cornell Notes

cue

Common traps

## Common traps

- Do not confuse electron-domain geometry with molecular shape when lone pairs are present.
- A polar bond does not always make a polar molecule; symmetry can cancel dipoles.
- Pi bonds require unhybridized p orbitals, so track sigma and pi bonds separately.
- Hydrogen bonding requires H bonded to N, O, or F and a nearby lone pair.

# Example Cards

### example 1

Unit 6 VSEPR and polarity workflow, P162-P166

VSEPR shape, hybridization, and polarity

1. Draw or read the Lewis structure first.
2. Count electron domains around the central atom.
3. Four domains with two lone pairs gives a bent molecular shape.
4. For $H_2O$, the O center is $sp^3$ and the bent shape makes the molecule polar.

Answer: $H_2O$: bent, $sp^3$, polar.

### example 2

Unit 6 σ/π clips, P160-P165

σ and π bond count

1. Every single bond is one σ bond.
2. A double bond has one σ bond and one π bond.
3. A triple bond has one σ bond and two π bonds.
4. Count each multiple bond by this pattern.

Answer: Double bond = 1 σ + 1 π; triple bond = 1 σ + 2 π.