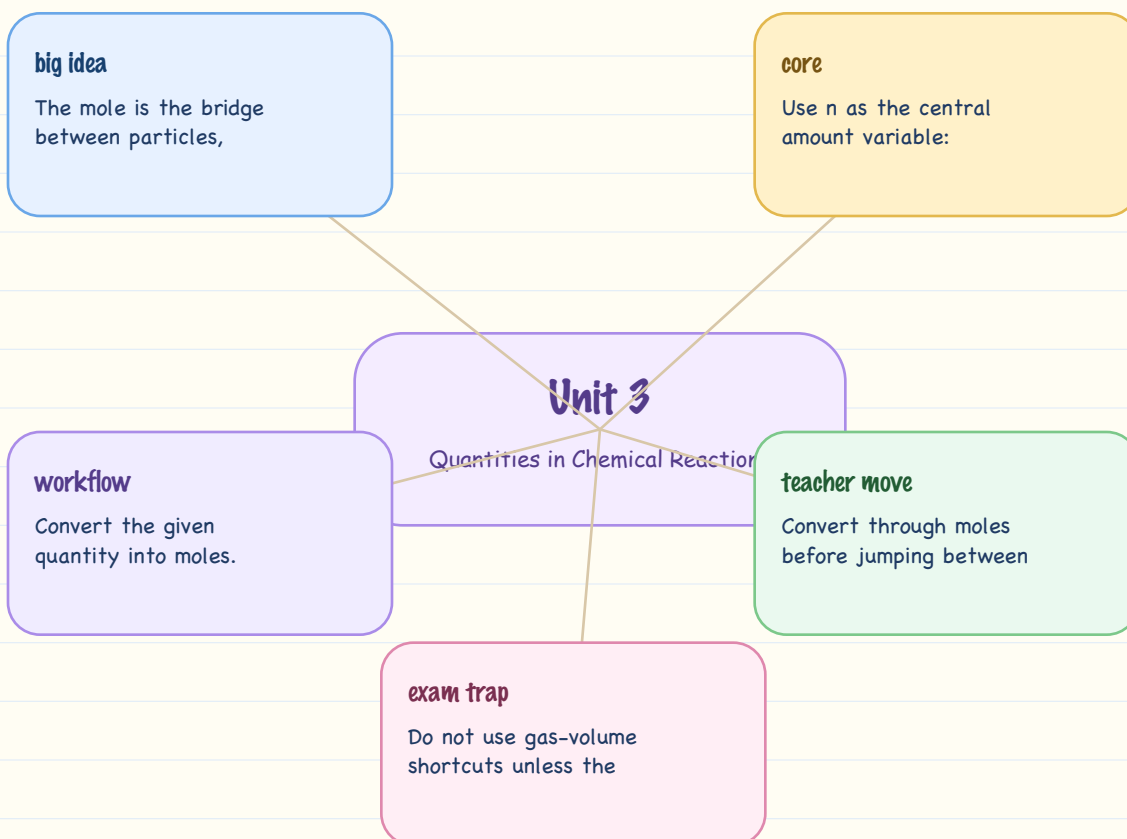


Unit 3 Visual Notebook

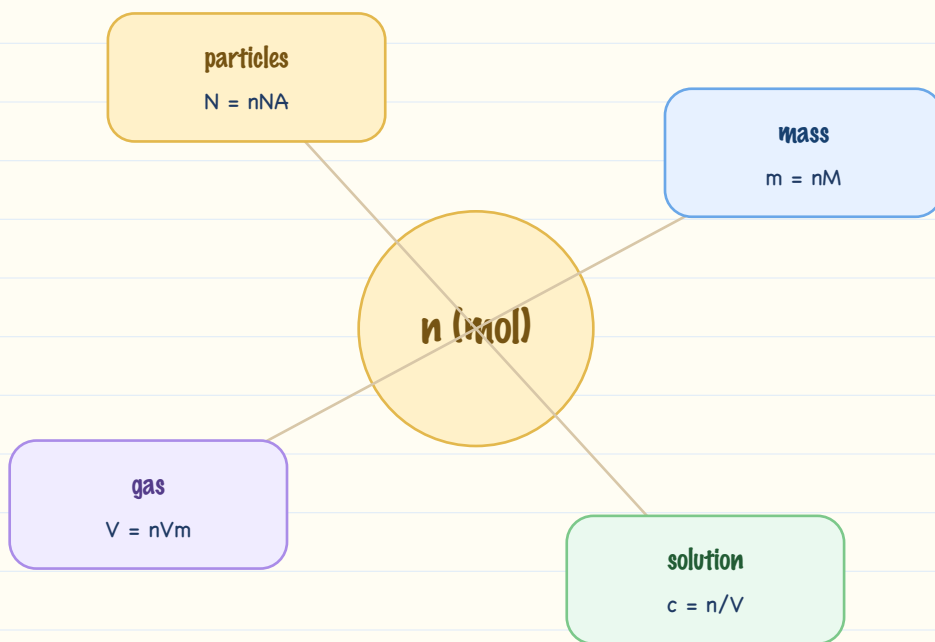
Moles, Concentration, and Stoichiometric Amounts

DISTILLED FROM VIDEO

12 lessons, P32-P43. Diagrams summarize the same source-locked workflows.



Visual Strategy



Teacher routine

- Convert through moles before jumping between quantities.
- Keep solution volume in litres.
- Use balanced coefficients as mole ratios.

Cornell Notes

cue

Core idea

Core idea

- Use n as the central amount variable: particles, mass, gas volume, and concentration all convert through n .
- Molar mass converts between mass and amount.
- Avogadro constant converts between number of particles and amount.

cue

Workflow

Workflow

- Convert the given quantity into moles.
- Use the formula or mole ratio that matches the question type.
- Convert from moles into the requested final unit.
- Carry units through every line.

cue

Teacher moves

Teacher moves

- Convert through moles before jumping between particles, mass, volume, and concentration.
- Use amount of substance as the central bridge variable.
- For concentration, keep volume in litres and use $c = n / V$.
- For Avogadro questions, count formula units, atoms, ions, and molecules separately.

Cornell Notes

cue

Common traps

Common traps

- Do not use gas-volume shortcuts unless the gas condition matches the problem.
- Do not leave solution volume in mL inside $c = n / V$.
- In stoichiometry, take the mole ratio only from the balanced equation.
- For Avogadro-constant questions, count atoms, molecules, and ions exactly as the formula indicates.

Example Cards

example 1

Unit 3 mole map, P32-P43

Mass to particles through moles

1. Convert mass to amount: $n = m / M$.
2. For 18.0 g H_2O , $M = 18.0 \text{ g/mol}$, so $n = 1.00 \text{ mol}$.
3. Convert amount to particles: $N = nNA$.
4. $N = 1.00 \times 6.02 \times 10^{23}$ molecules.

Answer: 6.02×10^{23} H_2O molecules.

example 2

Unit 3 concentration workflow, P35-P40

Concentration from moles and volume

1. Use $c = n / V$.
2. Convert 250 mL to 0.250 L before substituting.
3. If $n = 0.500 \text{ mol}$, $c = 0.500 / 0.250$.
4. $c = 2.00 \text{ mol/L}$.

Answer: 2.00 mol/L.