BALANCING CHEMICAL EQUATIONS

Representing reactions using formulae and equations



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DID YOU KNOW?

Atoms are never made or destroyed in reactions.





They only rearrange, so each side must have the same atoms.

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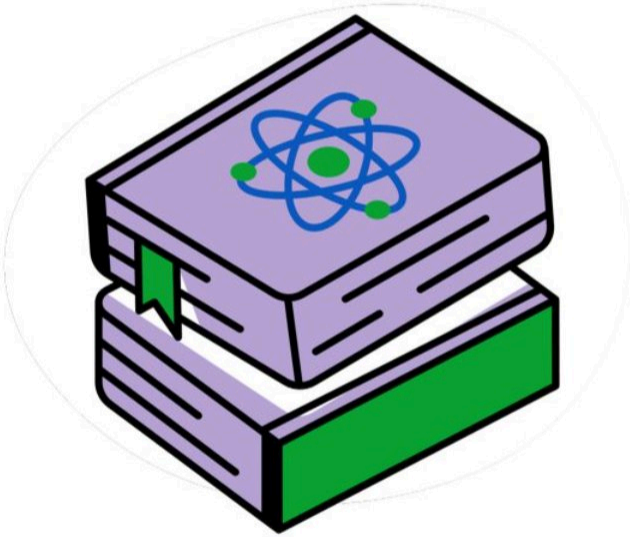
BALANCE IT IN 4 STEPS



1. Write correct formulae for all substances
2. Count atoms of each element both sides
3. Add big numbers in front, one element at a time
4. Recount and repeat until all match

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BIG IDEA

Balance the atoms, and you balance the mass.



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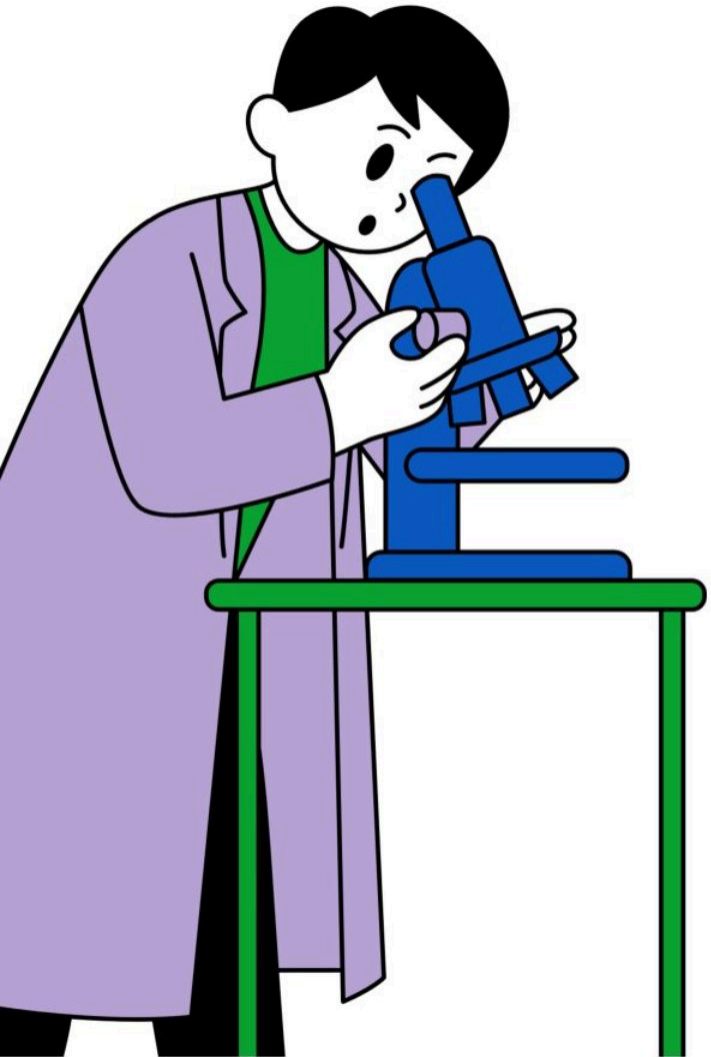

WHAT TRIPS YOU UP MOST?

Which part of balancing feels trickiest so far?

- **A** Writing correct formulae first
- **B** Leaving small numbers unchanged
- **C** Counting atoms on both sides

Vote with your hands, then explain why.

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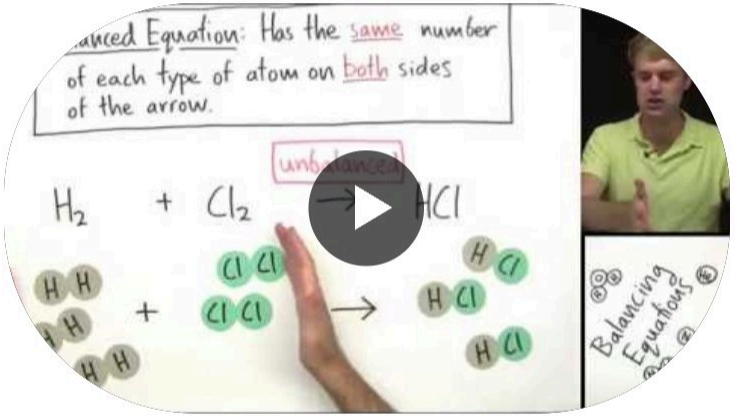
FROM WORDS TO FORMULAE





▶ 0:00 – 5:00

- Spot reactants on left, products on right
- Watch how formulae replace words
- Count atoms before balancing

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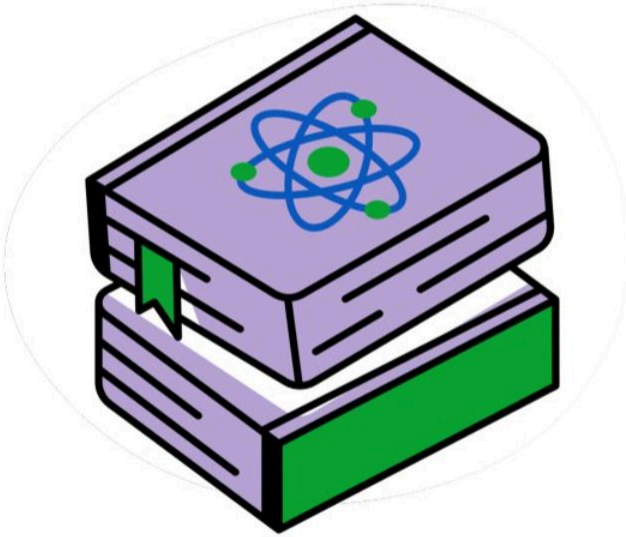
PARTS OF AN EQUATION



🧪

Reactants

Substances on the left that react together.

➡️

Arrow

Shows change from reactants to products.

🔢

Coefficients

Big numbers in front showing how many units.

💧

State symbols

(s), (l), (g), (aq) show state or dissolved.

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BIG VS SMALL NUMBERS



▶ 0:00 – 2:53

- Spot subscripts you must never change
- Spot coefficients you can change
- Check why H2O is not H2O2



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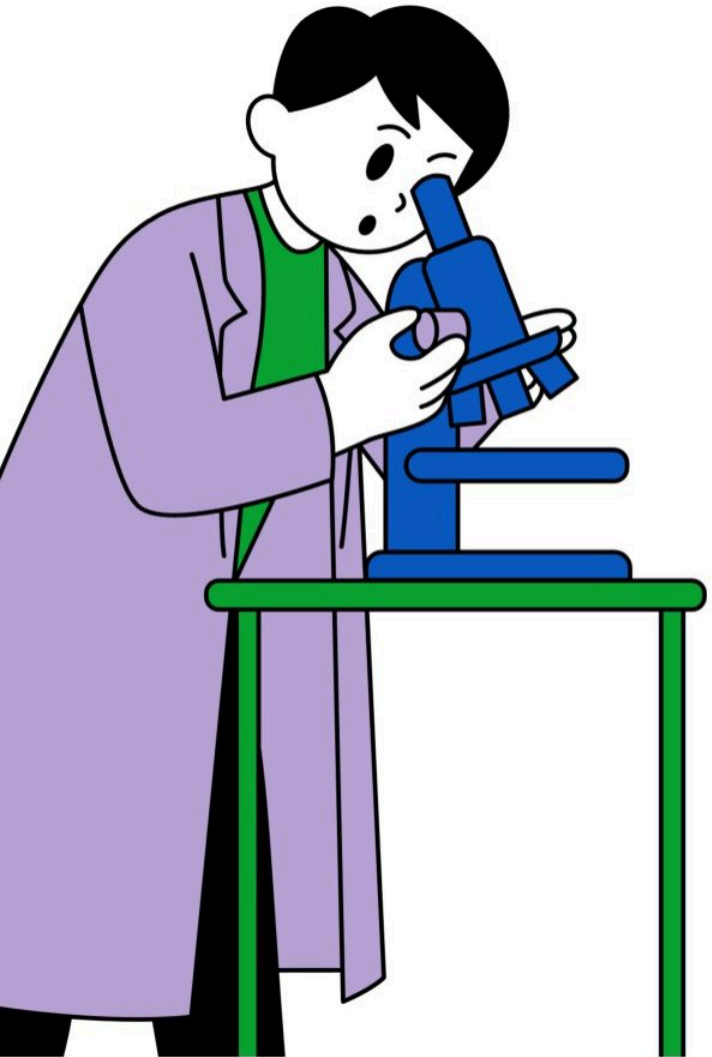

YOUR TASK

In pairs, balance these three equations on mini-whiteboards.

1. Balance: $Mg + O_2 \rightarrow MgO$; $H_2 + O_2 \rightarrow H_2O$; $CH_4 + O_2 \rightarrow CO_2 + H_2O$
2. Count atoms each side and only add big numbers
3. Add state symbols where you can

10 min

In pairs

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KEY WORDS



reactant

starting substance on the left side

product

new substance made on the right side

coefficient

big number in front you can change

subscript

small number in a formula you cannot change

conservation of mass

mass stays the same as atoms rearrange

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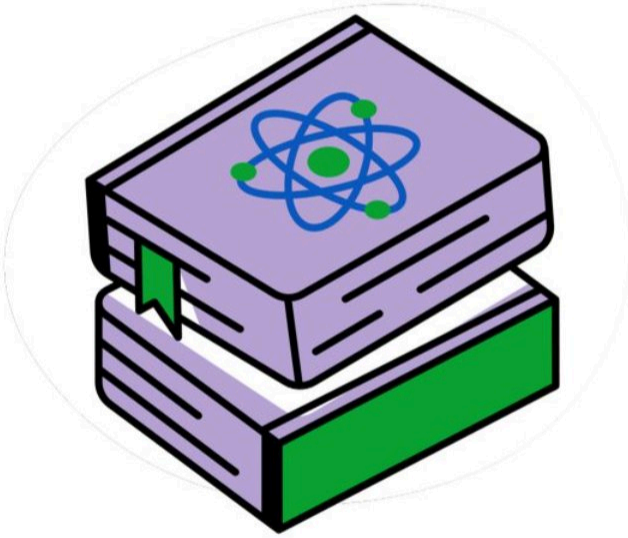
THINK, PAIR, SHARE



If mass stays the same, why must atom numbers match on both sides?



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QUICK QUIZ

1. In $N_2 + 3H_2 \rightarrow 2NH_3$, how many H atoms on each side?

2. True or false: change H_2O to H_2O_2 to balance?

3. What do (g) and (aq) mean?

4. Why do we balance equations?



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