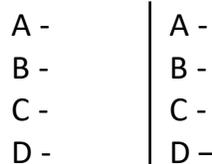
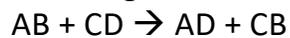


Balancing Equations Process

The process for balancing equations follows this procedure:

1. Write complete reaction (*reactants and products*)
2. Draw Balancing Chart
3. Use ratios to balance 1 atom
4. Change other atoms affected by balancing first atom
5. Balance additional atoms
6. Check overall balance of reaction

Balancing Chart



This chart is required for all reactions that are balanced

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Atomic Ratios in Chemical Equations

The balancing process requires making the number of atoms the same on both sides using atomic ratios.

Ratio	Balance	Ratio	Balance	Ratio	Balance
1/1	Balanced	1/2 2/1	2	2/3 3/2	6
2/2	Balanced	1/3 3/1	3	3/4 4/3	12
3/3	Balanced	1/4 4/1	4	2/4 4/2	4
4/4	Balanced	1/6 6/1	6	2/6 6/2	6
5/5	Balanced	4/6 6/4	12	3/6 6/3	6

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Polyatomic Ion Chart

The following is a list of common polyatomic ions

Polyatomic Ion	Ion Formula	Polyatomic Ion	Ion Formula	Polyatomic Ion	Ion Formula
Ammonium	NH ₄ ¹⁺	Hydronium	H ₃ O ¹⁺	Carbonate	CO ₃ ²⁻
Nitrate	NO ₃ ¹⁻	Cyanide	CN ¹⁻	Sulfate	SO ₄ ²⁻
Fluorate	FO ₃ ¹⁻	Hydroxide	OH ¹⁻	Chromate	CrO ₄ ²⁻
Chlorate	ClO ₃ ¹⁻	Acetate	C ₂ H ₃ O ₂ ¹⁻	Dichromate	Cr ₂ O ₇ ²⁻
Bromate	BrO ₃ ¹⁻	Permanganate	MnO ₄ ¹⁻	Oxalate	C ₂ O ₄ ²⁻
Iodate	IO ₃ ¹⁻	Bicarbonate	HCO ₃ ¹⁻	Phosphate	PO ₄ ³⁻

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Polyatomic Ion Conjugations

Some polyatomic ions can be changed by change number of oxygens

-ate (Base)	Ion Formula	-ite (-1 oxy)	Ion Formula	per_ite (+1 oxy)	Ion Formula
Chlorate	ClO ₃ ¹⁻	Chlorite	ClO ₂ ¹⁻	Perchlorate	ClO ₄ ¹⁻
Bromate	BrO ₃ ¹⁻	Bromite	BrO ₂ ¹⁻	Perbromate	BrO ₄ ¹⁻
Nitrate	NO ₃ ¹⁻	Nitrite	NO ₂ ¹⁻		
Carbonate	CO ₃ ²⁻	Carbonite	CO ₂ ²⁻		
Sulfate	SO ₄ ²⁻	Sulfite	SO ₃ ²⁻		
Phosphate	PO ₄ ³⁻	Phosphite	PO ₃ ³⁻		

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