

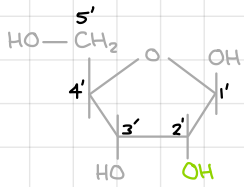
# Nucleic Acids

## DNA

- ↳ Genetic material
  - ↳ Precise sequence of many bases
- ↳ Double helix containing deoxyribose sugar, phosphate & nitrogenous bases
  - ↳ Forms twisted ladder due to polarity
    - ↳ Deoxyribose sugar → polar ∴ in backbone, close to surrounding H<sub>2</sub>O
    - ↳ Phosphate → polar ∴ in backbone, close to surrounding H<sub>2</sub>O
    - ↳ Bases → non-polar ∴ in centre & away from H<sub>2</sub>O
  - ↳ Antiparallel running
- ↳ Synthesis is unidirectional
  - ↳ 5' → 3' of carbons in the sugar
- ↳ Properties:
  - ↳ Stable → due to spiralling of ladder → protects weak H-bonds in the centre
  - ↳ Information → carries information through specific order of bases
  - ↳ Replication → can self-replicate

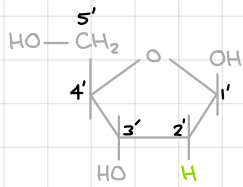
## Ribose Sugar

- ↳ In RNA
- ↳ More stable



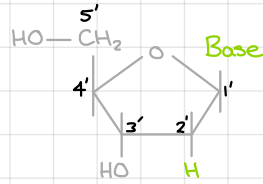
## Deoxyribose Sugar

- ↳ In DNA
- ↳ Less stable



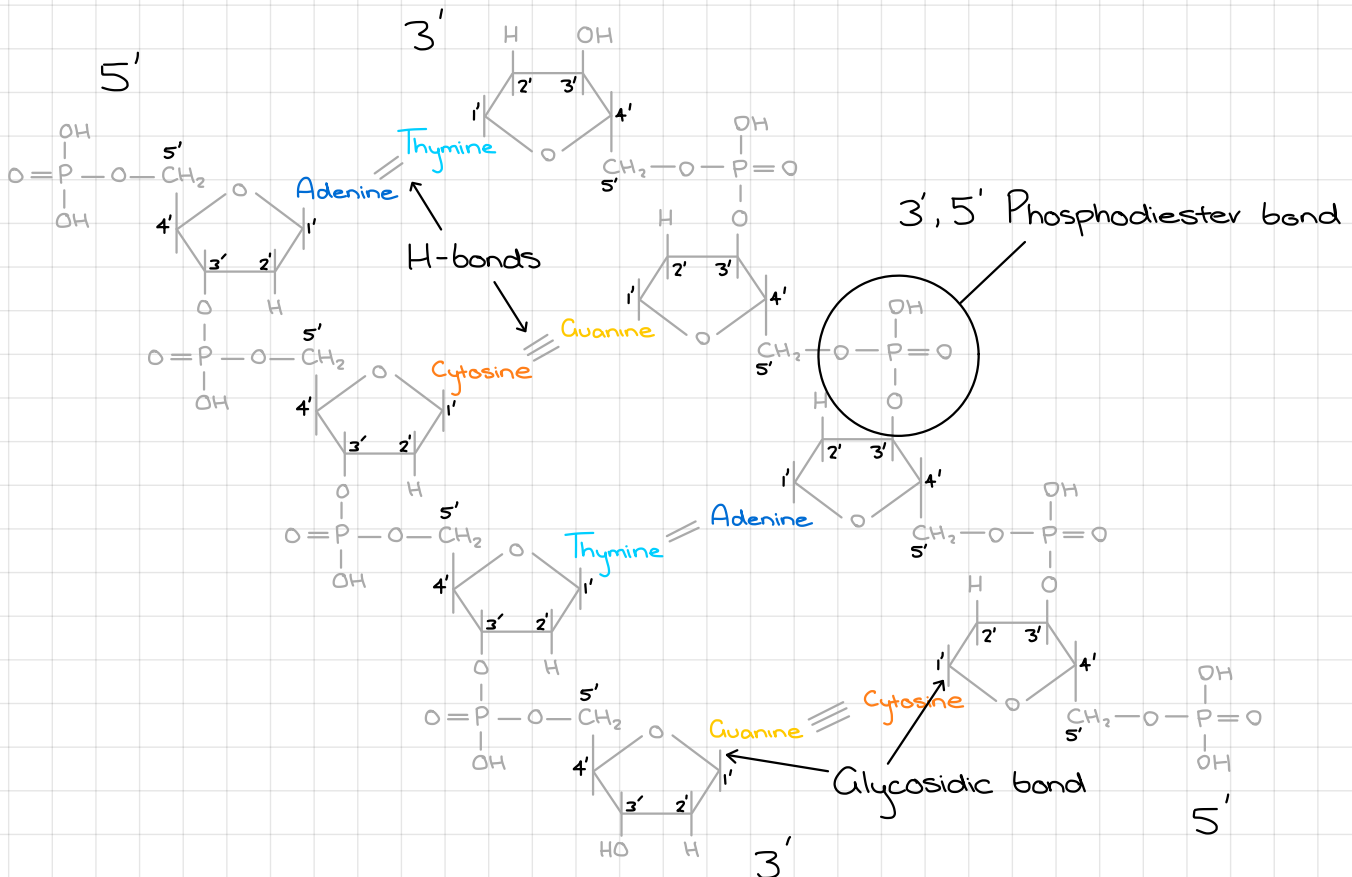
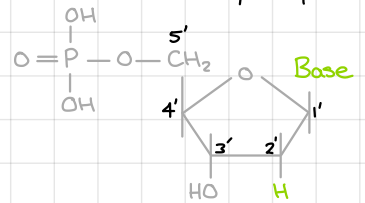
## Nucleoside

- ↳ Sugar & base



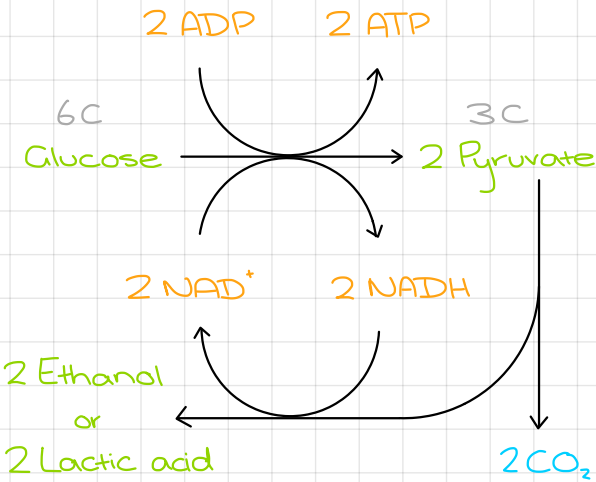
## Nucleotide

- ↳ Sugar, base & phosphate



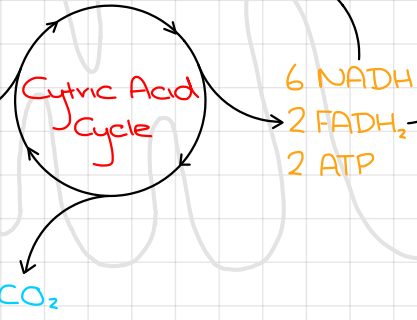
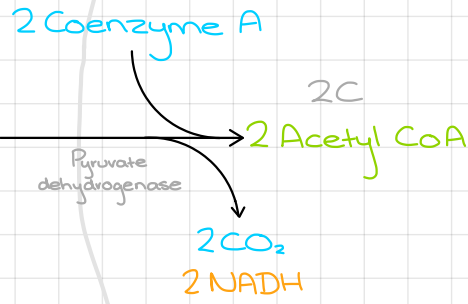
## Glycolysis

Total of 4 ATP produced  
however 2 ATP are consumed



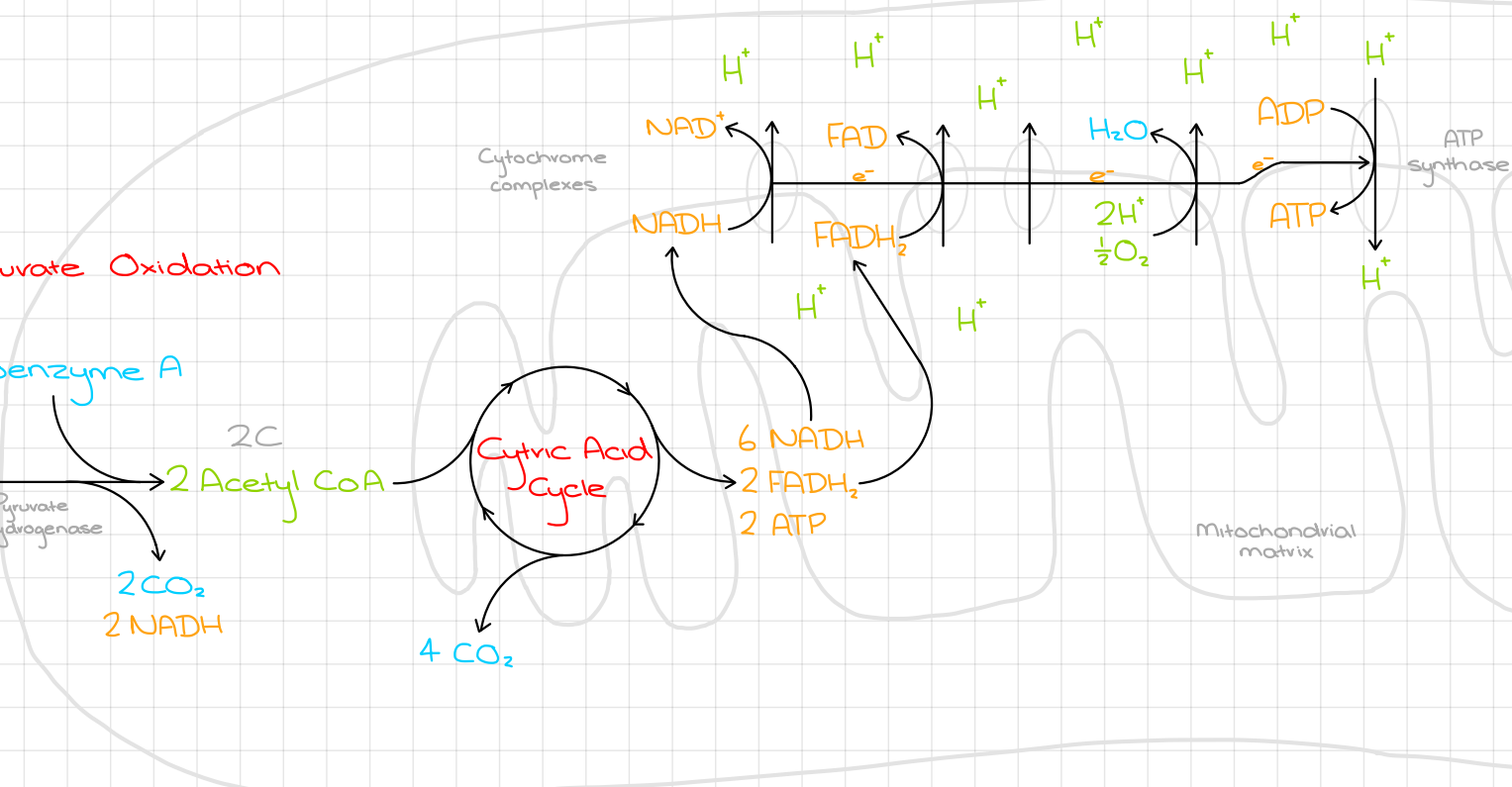
## Fermentation

## Pyruvate Oxidation



## Electron Transport Chain

## Chemiosmosis



Breakage of CH to harvest e<sup>-</sup>

Cannot break C=O ∴ released as CO<sub>2</sub>

NADH & FADH<sub>2</sub> provide energy to actively transport H<sup>+</sup> out of the mitochondrial matrix ∴ creating voltage gradient

E<sup>-</sup> move towards O<sub>2</sub> which is oxidised (gains e<sup>-</sup>) & joins with H<sup>+</sup> to form H<sub>2</sub>O

H<sup>+</sup> move to equilibrate voltage ∴ providing energy to create ATP

## Substrate Level Phosphorelation

↳ Formation of ATP

↳ Oxidative Phosphorelation

↳ With ATP synthase enzyme

## Cyanide stops the formation of H<sub>2</sub>O

Build up of O<sub>2</sub> & H<sup>+</sup>

↑ H<sup>+</sup> in the matrix

H<sup>+</sup> move out of matrix without NADH & FADH<sub>2</sub>

H<sup>+</sup> not freely move through ATP synthase  
Reduce ATP synthesis

Build up of NADH & FADH<sub>2</sub>  
Lack of NAD<sup>+</sup> & FAD  
Reduce glycolysis