

### Respiration

Cells release energy from Glucose by

#### Respiration

This is used to power all biological process in the cell

### 2 Types

Aerobic Respiration      Anaerobic Respiration

With Oxygen

Without Oxygen

### ATP

Cells can't get energy from glucose

Energy released from glucose is used to make ATP

ATP = Adenosine Triphosphate

ATP synthesized from ADP and inorganic phosphate via a condensation reaction

Diffuses to parts of cell that need energy

### Glucose Oxidation

Stage 1 **Glycolysis**

Stage 2 **Link Reaction**

Stage 3 **TCA Cycle/The Krebs Cycle**

Stage 4 **Electron Transport and oxidative phosphorylation**

### Locations of Glucose Oxidation Stages

**Glycolysis = Cytosol** gel like liquid in cell

**Link Reaction=Mitochondrion=Matrix**

**TCA/Krebs cycle=Mitochondrion=Matrix**

**Electron T and Ox**

**Phos=Mitochondrion=Inner Membrane\*\***

### CoEnzymes

CoEnzymes used in respiration are

NAD

CoEnzyme A

FAD

NAD and FAD transfer hydrogen from one molecule to another

Reduce or Oxidise

### Respiration is a Exothermic Reaction

Energy is given out to the surroundings

### Efficiency

Glucose oxidised to CO<sub>2</sub> and Water large amount of Energy is released

Energy is released piecemeal in series of small steps

Complete oxidation of glucose produces around 30 moles ATP

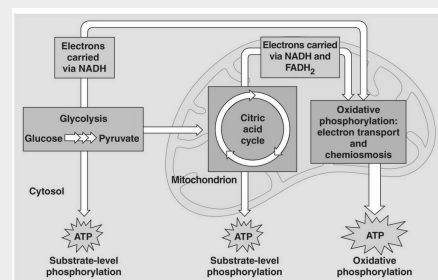
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### Overview Image



### Stage 1 Glycolysis

Brings about the splitting of each **6 Carbon glucose molecule** to 2 molecules of 3 Carbon intermediate **Pyruvate**

### Stage 2 Link Reaction

Converts each **Pyruvate** to a 2 carbon molecule and releases a 1 Carbon CO<sub>2</sub>

### Stage 3 TCA Cycle/Krebs Cycle

Completes the Breakdown into Carbon chain into Carbon dioxide (1C)

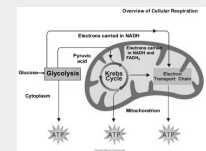
### S4 Electron Trans & Oxidative Phosphorylation

Produces a lot of ATP

Energy carried by electrons from reduced co-enzymes is used to make ATP

Involves a **Electron Transport chain** and **Chemiosmosis**

### Location image



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