

## GLYCOLYSIS

|           |                                                                                                        |
|-----------|--------------------------------------------------------------------------------------------------------|
| Location  | Cytoplasm                                                                                              |
| Type      | Anaerobic                                                                                              |
| Function  | To break down sugar                                                                                    |
| Reactants | Glucose ( $C_6H_{12}O_6$ )<br>$2 NAD^+$<br>$2 ATP$                                                     |
| Products  | $2$ Pyruvate ( $C_3H_4O_3$ )<br>$4 NADH$ (net: $2 NADH$ )<br>$4 ATP$ (net: <b><math>2 ATP</math></b> ) |

## LINK REACTION (INTERMEDIATE STAGE)

|                                                |                                                                                                 |
|------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Location                                       | Inner Matrix of Mitochondria                                                                    |
| Type                                           | Aerobic (O not consumed)                                                                        |
| Function                                       | To decarboxylate the pyruvic acid                                                               |
| Reactants<br>(per each of the <b>2</b> cycles) | $1$ Pyruvate<br>$1 NAD^+$<br>$1$ Coenzyme A (CoA)                                               |
| Products<br>(per each of the <b>2</b> cycles)  | $1 CO_2$ (released to atmosphere)<br>$1 NADH$ (electron carrier)<br>$1$ Acetyl-CoA ( $CH_3CO$ ) |

## KREBS CYCLE (CITRIC ACID CYCLE)

|                                                |                                                                                                                                                                   |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Location                                       | Mitochondrial Matrix                                                                                                                                              |
| Type                                           | Aerobic (O not consumed)                                                                                                                                          |
| Function                                       | To form electron carriers for ETC                                                                                                                                 |
| Reactants<br>(per each of the <b>2</b> cycles) | $1$ Acetyl-CoA<br>$3 NAD^+$<br>$1 FAD$<br>$2 H_2O$                                                                                                                |
| Products<br>(per each of the <b>2</b> cycles)  | $3 NADH$ (electron carrier)<br>$1 FADH_2$ (electron carrier)<br>$2 CO_2$ (released to atmosphere)<br>$1 H_2O$ (net: $-1 H_2O$ )<br><b><math>1 ATP</math> (x2)</b> |

## ELECTRON TRANSPORT CHAIN (OXIDATIVE PHOSPHORYLATION)

|           |                                                                                                                         |
|-----------|-------------------------------------------------------------------------------------------------------------------------|
| Location  | Inner Mitochondrial Membrane                                                                                            |
| Type      | Aerobic                                                                                                                 |
| Function  | To convert ADP to ATP                                                                                                   |
| Reactants | $10 NADH$ (2 from Glycolysis, 2 from Link, & 6 from Krebs)<br>$2 FADH_2$ (from Krebs Cycle)<br>$6 O_2$ (final acceptor) |
| Products  | $10 NAD^+$<br>$2 FAD$<br>$6 H_2O$<br>up to <b><math>34 ATP</math></b>                                                   |

