**The structure of the mitochondrion is adapted to the function it performs.**

1. On a separate sheet you are provided, draw and label a diagram showing the structure of a mitochondrion as seen in a TEM image. Include the inner and outer mitochondrial membranes, matrix, christae, mitochondrial DNA, ribosomes and a scale bar.
2. Complete the table below with the functions of the structures of the mitochondrion. Explain how each structure adapted to help maximize efficiency of respiration.

|  |  |  |
| --- | --- | --- |
| Structure: | Function: | Adapted to increase efficiency by: |
| outer membrane |  |  |
| inner membrane (including christae) |  |  |
| Matrix |  |  |
| mitochondrial DNA and ribosomes |  |  |
| inter-membrane space |  |  |

**Electron tomography involves the oxidation and reduction of electron carriers.**

1. Electron tomography is aiding the understanding of mitochondria and cell respiration. State what is meant by the term electron tomography.

**Cell respiration involves the oxidation and reduction of electron carriers.**

1. Many reactions in living things can be classified as either oxidation or reduction reactions. These are particulary important in cell respiration and photosynthesis. Complete the table below to compare oxidationa and reduction reactions.

|  |  |  |
| --- | --- | --- |
|  | OXIDATION | REDUCTION |
| Electrons are... |  |  |
| Oxygen is... |  |  |
| Hydrogen is... |  |  |

1. Describe what an electron carrier is.
2. List the two most common electron carriers used in cell respiration. Give both the oxidised and reduced forms:

Oxidised Reduced

**In glycosis, glycose is converted to pyruvate in the cytoplasm. Glycosis gives a small net gain of ATP without the use of oxygen.**

1. On the separate sheet, draw a diagram to show the process of glycosis. Include the following: cytoplasm, phosporylation, lysis, oxidation and ATP formation.

Phosphorylation of molecules makes them less stable.

1. Define phosphorylation.
2. Outline how phosphorylation aids cell respiration.

**In aerobic cell respiration pyruvate is decarboxylated and oxidized, and converted into acetyl compound and attached to coenzyme A to form acetyl coenzume A in the link reaction.**

1. On the separate sheet, draw a diagram to show the link reaction. Include the following: Pyruvate, CoA, Acetyl CoA, oxidation, decarboxylation, mitochondria, matrix.

**In the Krebs cycle, the oxidation of acetyl groups is coupled to the reduction of hydrogen carriers, liberating carbon.**

1. On the separate sheet, draw a diagram of the Krebs cycle. Include the following: Acetyl CoA, 4 carb compound, 6 carb compound, 5 carb compound, rearrangement, oxidation, decarboxylation, substrate-level phosphorylation (ATP formation), NAD+ reduced, FAD reduced, provides electrons to the electron transport chain.