

Name: Key

Quiz 22

For glucose conversion to two pyruvates via glycolysis:

- How many NADH are produced? 2
- How many FADH₂ are produced? 0
- How many ATP equivalents (ATP, GTP, and UTP)? 2

For the conversion of two pyruvates to six CO₂ via pyruvate dehydrogenase and the Krebs cycle:

- How many NADH are produced? 8
- How many FADH₂ are produced? 2
- How many ATP equivalents (ATP, GTP, and UTP)? 2

For the processing of ten NADH and 2 FADH₂ via the electron transport chain:

- How many ubiquinone are cycled? 12
- How many Cytochrome C are cycled? 24
- How many O₂ are used? 6
- How many H₂O are generated? 12
- What is the magnitude of the proton gradient created across the inner mitochondrial membrane? 112

For the flow of one hundred twelve protons across the inner mitochondrial membrane:

- How many protons are required to spin the ATP synthase rotor one rotation? 9
- How many ATP are produced each rotation of the ATP synthase generator? 3
- How many protons are required to generate one ATP with ATP synthase? 3
- How many protons are required to transfer an ATP from the mitochondrial lumen to the cytoplasm? 1
- How many protons are required to generate one ATP with ATP synthase and transfer it from the mitochondrial lumen to the cytoplasm? 4
- How many ATP are produced and transferred to the cytoplasm? 28

How many total ATP equivalents (ATP, GTP, UTP) are produced and located in the cytoplasm from the conversion of glucose to CO₂ via glycolysis, pyruvate dehydrogenase, the Krebs cycle, the electron transport chain, and ATP synthase?

32 (really 31)