**SBI4U 2-2: Pyruvate Oxidation & Citric Acid Cycle Worksheet**

1. Pyruvate oxidation and the citric acid cycle occur in this organelle\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Pyruvate oxidation begins with the products of glycolysis, \_\_\_\_ molecules of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. In pyruvate oxidation, each pyruvate molecule is converted to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ , in the process \_\_\_\_\_\_\_\_\_\_\_\_\_\_ molecules of NADH are produced from each pyruvate molecule.
4. In the first reaction of the citric acid cycle, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reacts with acetyl coA to produce citrate. The citrate is then converted to succinyl coA, in the process, \_\_\_\_\_\_ NADH are produced.
5. Succinyl coA is transformed into succinate, in the process, one molecule of \_\_\_\_\_\_\_\_\_\_\_ is formed, this molecule then goes on to produce \_\_\_\_\_\_\_ molecule(s) of ATP.
6. \_\_\_\_\_\_\_\_ molecule(s) of FADH2 is produced during one turn of the citric acid cycle, this is used to ultimately produce \_\_\_\_\_\_\_ molecules of ATP.
7. In the final series of reactions, fumarate is converted to oxaloacetate, in the process \_\_\_\_\_\_ molecule(s) of NADH is produced.
8. Oxaloacetate is the final product of the citric acid cycle, it can then react with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to begin the cycle again.
9. For every molecule of glucose, \_\_\_\_\_\_\_\_\_\_ rounds of pyruvate oxidation and the citric acid cycle occur.
10. Write the net equation for pyruvate oxidation:
11. Write the net equation for the citric acid cycle:

**Part 2:**

Complete the following table for the process pyruvate oxidation and the citric acid cycle for 1 molecule of glucose. Remember, that one molecule of glucose produces 2 pyruvate molecules at the end of glycolysis. Therefore, one molecule of glucose will generate 2 pyruvate oxidation reactions and 2 turns of the citric acid cycle.

**Pyruvate Oxidation and the Citric Acid Cycle**

|  |  |  |
| --- | --- | --- |
| **(From 1 molecule of glucose)** | **Pyruvate Oxidation** | **Citric Acid Cycle** |
| **ATP molecules produced** |  |  |
| **NADH produced** |  |  |
| **FADH2 produced** |  |  |
| **Overall Energy Yield** | **ATP\_\_\_\_\_\_\_\_\_\_\_\_\_****NADH\_\_\_\_\_\_\_\_\_\_****FADH2\_\_\_\_\_\_\_\_\_\_** | **ATP\_\_\_\_\_\_\_\_\_\_\_\_\_****NADH\_\_\_\_\_\_\_\_\_\_****FADH2\_\_\_\_\_\_\_\_\_\_** |