Jeopardy

Cellular Respiration and Fermentation

Cell respiration A	**Cell respiration B**	Fermentation	**Compare and contrast P/CR**
100	100	100	100
200	200	200	200
300	300	300	300
400	400	400	400
500	500	500	500

Question 1 - 10

- What is the alternative name for the Krebs cycle?

Answer 1 – 10

- **Critic acid cycle!**

Question 1 - 20

- Describe the difference between aerobic and anaerobic processes

Answer 1 – 20

- **Aerobic- require oxygen**
- **Anaerobic- do not require oxygen**
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Question 1 - 30

- What are the major stages of cell respiration?

Answer 1 – 30

- Glycolysis, Krebs cycle, ETC

Question 1 - 40

- What is Glycolysis? Be sure to state the the final output in detail

Answer 1 – 40

- **Process where glucose is broken down by the addition of ATP (which leaves as ADP) to produce**
- **2 NADH, 2 net ATP and 2 pyruvate**

Question 1- 50

- Briefly Describe the 4 steps of ETC

Answer 1 – 50

1. Electrons removed from NADH and $FADH_2$ and used for energy
2. Hydrogen ions transported
3. ATP produced
4. Water formed

Question 2 - 10

- Which stage of cellular respiration produces the most ATP? Roughly how many are produced?

Answer 2 – 10

- ETC, about 34- be sure not to count the 2 from glycolysis and 2 from the Krebs cycle in answering this question

Question 2 - 20

- Name and describe the structure of the organelle involved with cellular respiration.

Answer 2 – 20

- Mitochondria
- Outer membrane, inner membrane, matrix
- Inner membrane and matrix are directly part of respiration

Question 2 – 30

- In which stage of cellular respiration is CO_2 waste produced?

Answer 2 – 30

- Krebs cycle

Question 2 - 40

- Which step of the Krebs cycle is considered to be an intermediate step?

Answer 2 – 40

- Step 2, CoA

Question 2 - 50

- Briefly describe the steps of the Krebs cycle!

Answer 2 – 50

1. Pyruvate broken down
2. Coenzyme A
3. Citric acid formed
4. Citric acid broken down
5. 5 carbon molecule broken down
6. 4 carbon molecule rearranged

Question 3 - 10

- What causes the burning sensatation in your muscles when you exert yourself?

Answer 3 – 10

- The build up of lactic acid during fermentation

Question 3 - 20

Why is fermentation necessary in animal cells like ours?

Answer 3 – 20

- We cannot store large amounts of oxygen. We need a temporary back up plan to continue to produce at least a little ATP if our cells find themselves in anaerobic conditions where cellular respiration cannot proceed. This back up plan is fermentation

Question 3 - 30

- What product of glycolysis is turned into $C_3H_6O_3$? What is $C_3H_6O_3$?

Answer 3 – 30

- Pyruvate
- Lactic acid

Question 3 - 40

- Describe how yeast causes bread to rise

Answer 3 – 40

- Yeast breaks down sugar in the dough through glycolysis and alcoholic fermentation
- The build up of CO_2 (a product of alcoholic fermentation) causes the dough to puff up

Question 3 - 50

- What does fermentation do (detailed description)

Answer 3 – 50

- Allows glycolysis to continue by removing an electron from NADH to form NAD+ which is needed for glycolysis to pick up the high energy electrons relseased furing the breakdown of glucose
- Does not produce any ATP itself

Question 4 - 10

- In which organelle does cellular respiration occur? Photosynthesis?

Answer 4 – 10

- Mitochondria
- Chloroplast

Question 4 - 20

Send someone to the board to write the equations for both photosynthesis and cellular respiration

Answer 4 – 20

- Photosynthesis: $CO_2 + H_2O \rightarrow C_6H_{12}O_6 + O_2$
- Cellular Respiration: $C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O$

Question 4 - 30

- Where is the ETC located in photosynthesis and cellular respiration?

Answer 4 – 30

- P- thylakoid membrane
- CR- innermitochondrial membrane

Question 4 - 40

- Where do the cycle of chemical reactions occur in photosynthesis and cellular respiration (be specific)? What are the cycles called?

Answer 4 – 40

- P- Calvin cycle, stroma of chloroplast
- CR- Krebs cycle, matrix of mitochondria

Question 4 - 50

- Which steps of the second half of cellular respiration (Electron Transport Chain) are similar to something we see in the light dependent reactions of photosynthesis?

Answer 4 – 50

- The ETC proteins use energy provided from the electrons that are part of NADH and $FADH_2$ to pump H+ against the concentration gradient and across the innermitochondrial membrane
- The ions will diffuse out allowing for ATP production
- Steps 2 and 3 of ETC
- Steps 3 and 6 of light dependent reactions