

Cellular Respiration Web Quest

Name (s):

Date completed:

Class period:

Follow the links/directions for each section. Answers need NOT be in complete sentences.

Part 1: ATP: THE ENERGY OF LIFE

Go to: "Biology in Motion" website. Read & complete the activity. Answer the questions below.
<http://www.biologyinmotion.com/atp/index.html>

1. What does the acronym "ATP" stand for?
2. What is the role of ATP in living things?
3. When ATP is used, a phosphate group is **removed/added** (circle one), and the energy from the broken bond can be used by the cell.
4. After a phosphate is broken off, ATP is converted into _____.
5. Can ADP be converted back into ATP? How? (briefly explain).
6. In *frame 2*, use your mouse to break apart (digest) the food (ice cream cone). What happens?

Now, take a phosphate off the ATP. What happens?

7. **THINK:** ATP provides the body with energy. Give 3 *specific* examples of how ATP is used in organisms.

Part 2: AN OVERVIEW OF CELLULAR RESPIRATION

Go to "Understanding Cellular Respiration"

http://www.essortment.com/all/cellularrespira_rmpr.htm

Read through the information provided to answer the questions below.

8. Write the equation for aerobic cellular respiration.

9. What are the three steps of cellular respiration?

10. Where (specifically) in the cell does each of the steps you listed above (#9) occur? (hint: each takes place in a slightly different location than the other steps)

11. The initial step of respiration, in which glucose is first broken down into two molecules of pyruvate is called _____.

This stage produces a net gain of ___ ATP molecules, as well as a release of ___ water molecules and ___ NADH molecules (these are another type of energy-rich molecule).

12. The Krebs cycle is an aerobic process, which means it requires _____ in order to occur.

13. The Krebs cycle produces: ___ carbon dioxide molecules, as well as three types of energy-yielding molecules: ___ NADH molecules, ___ ATP molecules and ___ FADH₂ molecules.

14. The electrons and protons from the NADH and FADH₂ molecules produced in the first two steps are then passed along the _____ _____ and chemiosmosis is used to produce _____ ATP. (how much?)

15. What molecule is the "final electron acceptor" at the end of the electron transport chain?

16. When oxygen is absent (or not enough oxygen is present), the Krebs and ETC cannot operate, yet some organisms can still make enough ATP to survive **using WHAT alternative to cellular respiration?**

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17. How many ATP molecules can be made this way (refer to #16 above)?

Part 3: CELLULAR RESPIRATION: A CLOSER LOOK

Go to "BioCoach Activity: Cell Respiration". Click on each concepts and answer the following questions. http://phschool.com/science/biology_place/biocoach/cellresp/intro.html

18. Click through *Concepts 1 & 2*. The function of the glycolysis stage is to split glucose into two molecules of _____.

19. Note how two molecules of ATP *are used* to drive glycolysis, yet the actual splitting of glucose *produces* four ATPs. Do the math! What is the net gain of ATP?

Now, Click on *Concept 3*. Read through the information on the Krebs (Citric Acid) Cycle. Click through the "Review" in the top right corner.

20. Why is the Krebs cycle sometimes referred to as the "Citric acid cycle"? (Hint: look at the first product made in the cycle!)

21. Explain why this process is called a "cycle"? (Hint: what is the starting *and* ending molecule?)

22. Click on *Concept 4*. **Click through the "Review" in the top right corner.** Briefly summarize the *purpose* of the Electron Transport Chain (in your own words).

Part 4: FERMENTATION

Go to Cellular Respiration. Read about fermentation.

http://en.wikipedia.org/wiki/Cellular_respiration

23. Explain the difference between ethanol fermentation and lactic acid fermentation.

Part 5: CELL RESPIRATION: A SUMMARY

a) Go to About.com: Biology: Cellular Respiration. Read about ATP yields.
<http://biology.about.com/library/weekly/aa090601a.htm>

24. How many ATPs are produced total in cellular respiration?

b) Game

Go to "Quia: Cellular Respiration". <http://www.quia.com/jg/835446.html>

You may select the "Matching Game" OR the "Word Search" to complete. Do ONE.

25. Which activity did you complete?

* This site requires Java installation, which may not load on the Macs. If this is the case, you should click on the "list of terms" link and use each of these in a sentence. (This means you should write 17 separate sentences, each which incorporates a term from the list.) Attach this to this assignment.

c) CELLULAR RESPIRATION: A QUIZ.

Go to "About.com: Biology: Cellular Respiration Quiz".

<http://biology.about.com/library/quiz/blcellresquiz.htm>

26. Take the quiz. Write your score here: _____

For those that you miss, write the question with the correct answer underlined in the space below.

credits: adapted from <http://www.poland.k12.oh.us/Teachers/hbq/respiration%20webquest.pdf>

additional notes:

pyruvate = pyruvic acid

citrate = citric acid

oxaloacetate = oxaloacetic acid