ATP, Photosynthesis and Cellular Respiration WebQuest Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Biology Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hr: \_\_\_\_\_\_\_\_

Objective: In this web quest investigation, you will use the internet to research topics related to ATP, Photosynthesis, Cellular Respiration and Fermentation. Use the web links provided to answer the following questions. Happy searching!

**Part I. What is ATP?** <http://www.biologyinmotion.com/atp/index.html>

1. How does energy get converted from food molecules to muscles? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. According to the webpage, the analogy for ATP is that ATP works like a rechargeable \_\_\_\_\_\_\_\_\_\_\_\_.

3. Click on the arrow to the next page. Pull apart the ice cream. What happens when food is broken down in the body?

4. Pull a Phosphate from the recharged ATP, what happens?

**Part 11. What is Photosynthesis?** <http://www.biology.ualberta.ca/facilities/multimedia/uploads/alberta/Photo.html>

5. Where in the plant does photosynthesis take place? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. The energy from the sun enters into what organelle in the plant? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. How does the plant get water for photosynthesis? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. What gas enters the plant for photosynthesis? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. Where does it enter the plant? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. What gas exits the plant during photosynthesis? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. Where does it exit the plant? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. What is the overall equation for photosynthesis? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

<http://www.webexhibits.org/causesofcolor/7A.html>

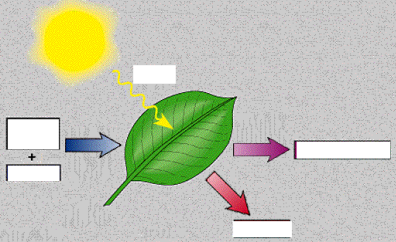
13. Plants contain what two forms of Chlorophyll?

14. What color of light is absorbed best by plants? 2nd best? Reflected?

15. What metal ion is found at the center of the Chlorophyll molecule?

16. During photosynthesis what happens to the electrons?

**Overview of Photosynthesis Labeling.** Label the following picture below. <http://www.phschool.com/science/biology_place/biocoach/photosynth/overview.html>



***Part III: “Autumn Leaves – Why do leaves change color in the Fall?”***

[*http://www.sciencemadesimple.com/leaves.html*](http://www.sciencemadesimple.com/leaves.html)

1 What do plants do during the winter? Why must they do this?

2 During the winter, what happens to the chlorophyll in the leaves?

3 Why can’t we see the yellows and oranges in the summer?

4 What causes maple leaves to appear red?

5 What causes oak leaves to appear brown?

**Part IV: What is Cellular Respiration?** <http://www.qcc.cuny.edu/BiologicalSciences/Faculty/DMeyer/respiration.html>

13. What molecule enters Glycolysis?

14. What gas (in white) is released during the Krebs cycle?

15. What molecule (in purple) is released from the Krebs cycle and enters the Electron transport chain?

16. What molecule (in dark blue) is released as a product from the Electron transport chain?

17. What energy molecule in Teal is restored as a product of cellular respiration? What is Glycolysis? http://highered.mcgrawhill.com/sites/0072507470/student\_view0/chapter25/animation\_\_how\_glycolysis\_works.html

18. What is the main reactant for glycolysis? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

19. What is the product of glycolysis? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

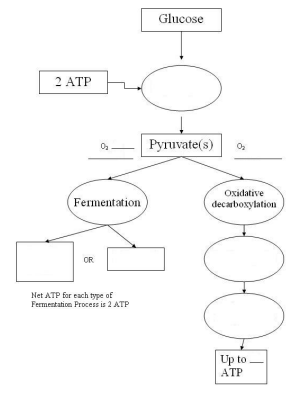
20. How many ATP molecules of ATP are used to start glycolysis? \_\_\_\_\_\_\_\_\_\_\_

21. What are the 3 carbon molecules called? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

22. What molecule is required for aerobic conditions? (think!) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

23. What happens if there are anaerobic conditions, what is pyruvate converted into by animals and by yeasts?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Aka the source of sore muscles!) & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



**Overview of Cellular Respiration Labeling.** Label the following picture to the left. <https://simple.wikipedia.org/wiki/Cellular_respiration>

OR

<http://www.tutorvista.com/biology/the-cellular-respiration-process>

**Part V: Anaerobic vs Aerobic Respiration**

<http://www.tutorvista.com/content/biology/biology-ii/respiration/aerobic-and-anaerobic.php#>

*Scroll down to Anaerobic Respiration*

24. What is the difference between aerobic and anaerobic cellular respiration?

25. What is lactic acid fermentation? Where does it occur?

26. What does a build up of lactic acid cause?

27. What is alcoholic fermentation?

28. In what industry is alcoholic fermentation important? [List several and use]

29. Which produces the larger amount of energy – aerobic or anaerobic respiration?

*Support your answer with information from the reading*.

30. Write a summary of cellular respiration. In your response:

• State the function of cellular respiration

• Identify the site of cellular respiration

• Compare aerobic and anaerobic forms of cellular respiration

Upon Completion of the WebQuest you may play the following game or do the interactive: <http://www.biomanbio.com/GamesandLabs/PhotoRespgames/phorespgame.html>

OR <http://www.pbs.org/wgbh/nova/nature/photosynthesis.html>