

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

**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 happened? \_\_\_\_\_

**ATP Synthase the Movie:** <http://vcell.ndsu.nodak.edu/animations/atpgradient/movie.htm>

Watch the following movie, you can pause if needed. Answer the following questions.

5. What is a gradient? \_\_\_\_\_
6. What is the enzyme that restores ADP back to ATP? \_\_\_\_\_
7. In which organelle is ATP synthesized or made? \_\_\_\_\_
8. What type of ion is built into a gradient so ATP synthase can work? \_\_\_\_\_
9. What does the top part of ATP synthase do when Hydrogen ions enter? \_\_\_\_\_
10. How many ions have to enter in order for ATP synthase to have enough energy to make ATP? \_\_\_\_\_
11. How is the gradient of ions maintained in the mitochondria? \_\_\_\_\_

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

12. Where on the plant does photosynthesis take place? \_\_\_\_\_
13. The energy from the sun enters into what organelle in the plant? \_\_\_\_\_
14. How does the plant get water for photosynthesis? \_\_\_\_\_
15. What gas enters the plant for photosynthesis? \_\_\_\_\_
16. Where does it enter the plant? \_\_\_\_\_
17. What gas exits the plant during photosynthesis? \_\_\_\_\_
18. Where does it exit the plant? \_\_\_\_\_
19. What is the overall equation for photosynthesis? \_\_\_\_\_

**The Light reaction of Photosynthesis:**

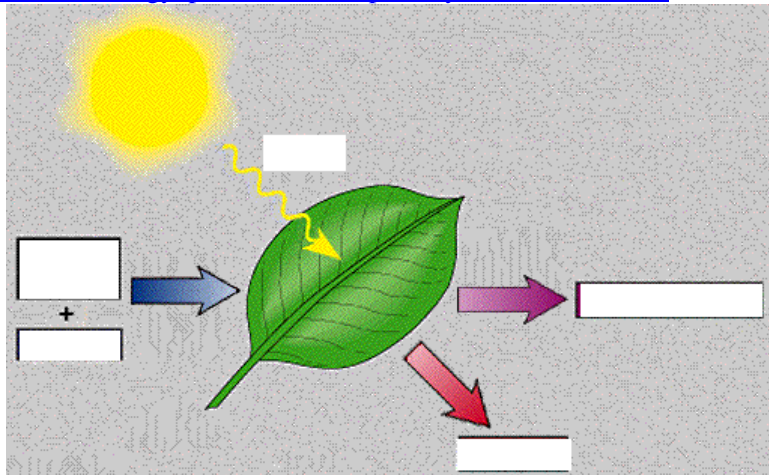
<http://highered.mheducation.com/olcweb/cgi/pluginpop.cgi?it=swf::535::535::sites/dl/free/0072437316/120072/bio13.swf::Photosynthetic+Electron+Transport+and+ATP+Synthesis>

20. What is split to replenish the electrons (that also makes Oxygen gas)? \_\_\_\_\_
21. The excited electrons pump what ion to create a gradient? \_\_\_\_\_
22. The ATP synthase uses this gradient to restore ADP back to ATP.  
What is this process called? \_\_\_\_\_

**The Dark reaction of Photosynthesis:** [https://www.youtube.com/watch?v=E\\_XQR800AgM](https://www.youtube.com/watch?v=E_XQR800AgM)

23. In what part of the chloroplast does the dark reaction take place? \_\_\_\_\_
24. What gas is taken in to start the Calvin Cycle? \_\_\_\_\_
25. What are the 2 products of the light reaction used in the Calvin Cycle? \_\_\_\_\_
26. What is the final product of the Calvin Cycle? \_\_\_\_\_

**Overview of Photosynthesis Labeling.** Label the following picture below. 27 & 28  
[http://www.phschool.com/science/biology\\_place/biocoach/photosynth/overview.html](http://www.phschool.com/science/biology_place/biocoach/photosynth/overview.html)



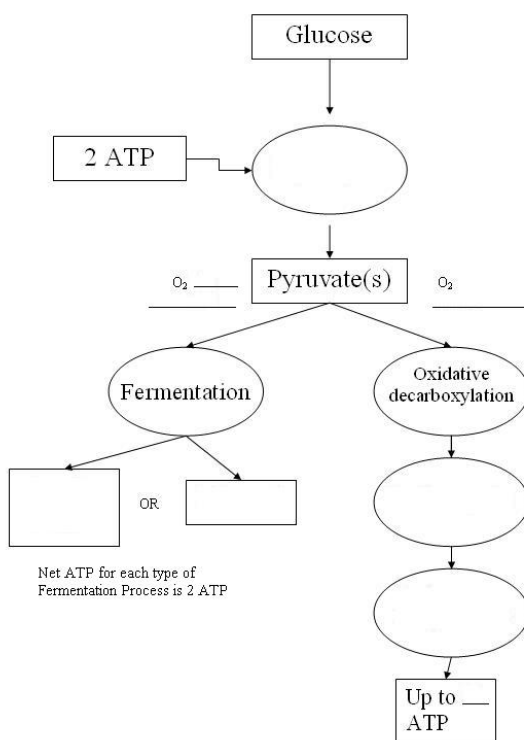
**What is Cellular Respiration?** <http://www.qcc.cuny.edu/biologicalSciences/Faculty/UGolebiewska/respiration.html>

29. What molecule enters Glycolysis?
30. What gas (in white) is released during the Krebs Cycle?
31. What molecule (in purple) is released from the Krebs cycle and enters the Electron transport chain?
32. What molecule (in dark blue) is released as a product from the Electron transport chain?
33. What energy molecule in Teal is restored as a product of cellular respiration?

**What is Glycolysis?**

[http://highered.mheducation.com/sites/0072507470/student\\_view0/chapter25/animation\\_how\\_glycolysis\\_works.html](http://highered.mheducation.com/sites/0072507470/student_view0/chapter25/animation_how_glycolysis_works.html)

34. What is the main reactant for glycolysis? \_\_\_\_\_
35. What is the product of glycolysis? \_\_\_\_\_
36. How many ATP molecules of ATP are used to start glycolysis? \_\_\_\_\_
37. What are the 3 carbon molecules called? \_\_\_\_\_
38. What molecule is required for aerobic conditions? (Not on slide, think!) \_\_\_\_\_
39. What happens if there are anaerobic conditions, what is pyruvate converted into? \_\_\_\_\_  
 (Aka the source of sore muscles!)



**Alcoholic Fermentation in Yeast:**

<http://www.indiana.edu/~oso/animations/glycolysis%20simplified.html>  
 In this animation, use the enzymes to convert glucose into ATP.

40. When you add the fifth enzyme (dark purple) to pyruvate, what did you have to add? \_\_\_\_\_
41. When you added the sixth enzyme to pyruvate with Phosphate and ADP, what did it make? \_\_\_\_\_
42. When you add the final enzyme, what were the products of the reaction? \_\_\_\_\_

**Overview of Cellular Respiration Labeling.** Label the following picture to the left. 43-45.

<https://upload.wikimedia.org/wikipedia/commons/1/1d/Cellularrespiration.JPG>