**Topic Review Guide**: Cellular Respiration (Topic 3.6)

**To Think About**: The highly complex organization of living systems requires a constant input of energy and the exchange of macromolecules.

**Watch:** AP Daily [Video 1](https://apclassroom.collegeboard.org/d/xamh9qo5nz?sui=6,3), [Video 3](https://apclassroom.collegeboard.org/d/bgq2vrgpow?sui=6,3), [Video 2](https://apclassroom.collegeboard.org/d/2wme1jhmpx?sui=6,3)

**Read:** Chapter 7, Biology in Focus

**Supplementary Resources**: Click the links below for more information to help you learn more about this lesson.

* Guided Notes 3.4 [Video 1](https://docs.google.com/document/d/10tpm3RXhx3U2GJWd8tNcnfieJESG9auYFz7Fvfq5VFw/edit?usp=sharing), [Video 3](https://docs.google.com/document/d/1pFd2FYlpl-RmTkXC0Jl3bhZBk73VICTLB8yuvbO4xXU/edit?usp=sharing), [Video 2](https://docs.google.com/document/d/1yeZKLG1FxjqWrXXkx4UYaySFqjaZ0hmRELBnYQg81jY/edit?usp=sharing),
* [Mr. Andersen’s “Anaerobic Respiration” video](https://youtu.be/cDC29iBxb3w)
* McGraw Hill: [How Glycolysis Works](http://highered.mheducation.com/sites/0072507470/student_view0/chapter25/animation__how_glycolysis_works.html)
* McGraw Hill: [How the Krebs Cycle Works](http://highered.mheducation.com/sites/0072507470/student_view0/chapter25/animation__how_the_krebs_cycle_works__quiz_1_.html)
* McGraw Hill: [The Electron Transport System and ATP Synthesis](http://highered.mheducation.com/sites/0072507470/student_view0/chapter25/animation__electron_transport_system_and_atp_synthesis__quiz_1_.html)
* Sumanas, Inc.: [Cellular Respiration Animation](http://www.sumanasinc.com/webcontent/animations/content/cellularrespiration.html)
* Virtual Cell Animation: [Glycolysis, Step by Step](http://vcell.ndsu.nodak.edu/animations/glycolysis_overview/first.htm)
* PHSchool.com: [Cellular Respiration Animation](http://www.phschool.com/atschool/phbio/active_art/cellular_respiration/index.html)

**Recall and Review:** Use the lecture in the video and your textbook to help you answer these questions in your BILL. Before you start, mark your level of understanding. After you have completed the questions, then check to see what level of understanding you have achieved. If you’re still at a level N or level A, it is recommended that you stop in for office hours.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Essential Knowledge:**  What You Absolutely Must Know and Understand | | | | |
| Levels of Mastery | | | | *I can describe the processes that allow organisms to use energy stored in biological macromolecules. (Topic 3.6)* |
| **N** | **A** | **M** | **E** | **Questions You Should Be Able to Answer** |
|  |  |  |  | 1. **Identify** three activities that cells perform that require the use of ATP. |
|  |  |  |  | 1. **Draw** a diagram that illustrates where the four steps of cellular respiration occur in a eukaryotic cell. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Essential Knowledge:**  What You Absolutely Must Know and Understand | | | | |
| Levels of Mastery | | | | *I can explain how cells obtain energy from biological macromolecules in order to power cellular functions. (Topic 3.6)* |
| **N** | **A** | **M** | **E** | **Questions You Should Be Able to Answer** |
|  |  |  |  | 1. **State** the purpose of glycolysis. |
|  |  |  |  | 1. **Describe** the fate of pyruvate. |
|  |  |  |  | 1. **Identify** the products of the Krebs Cycle (Citric Acid Cycle) |
|  |  |  |  | 1. **Explain** what happens to the electrons extracted in glycolysis and Krebs. |
|  |  |  |  | 1. In the absence of oxygen, fermentation occurs.  **Explain** why fermentation must occur and state products produced. |
|  |  |  |  | 1. **Describe** how energy is released from ATP. |
|  |  |  |  | 1. **State** the function of the Electron Transport Chain. |
|  |  |  |  | 1. NAD and FAD are compounds known as electron carriers (coenzymes). **Describe** the activity of these coenzyme molecules in cellular respiration. |
|  |  |  |  | 1. **Explain** why oxygen is important to the process of cellular respiration. |
|  |  |  |  | 1. The electron transport chain is a series of proteins on the inner membrane of the mitochondria. **Describe** the role of these proteins during the process of cellular respiration. |
|  |  |  |  | 1. **Identify** where oxidative phosphorylation occurs during cellular respiration. |
|  |  |  |  | 1. **Compare and contrast** chemiosmosis that takes place in the mitochondria to produce ATP to the osmosis of water that can occur in a cell. |
|  |  |  |  | 1. **Explain** why decoupling during cellular respiration is important. |
|  |  |  |  | 1. **Create** a graphic organizer that illustrates the reactants, products and locations for each of the major stages of cellular respiration:    1. Glycolysis    2. Pyruvate Oxidation    3. Krebs Cycle    4. Oxidative phosphorylation |

|  |
| --- |
| Learn More: For more information about energy exchanges and how they make the world go round, check out the links below:   * John Kyrk: [Glycolysis Animation](http://www.johnkyrk.com/glycolysis.html) * John Kyrk: [Oxidative Phosphorylation Animation](http://www.johnkyrk.com/mitochondrion.html) * John Kyrk: [Krebs Cycle Animation](http://www.johnkyrk.com/krebs.html) * Bozeman Science: [The Importance of Oxygen](https://youtu.be/o61dTk4J9AU) |