**Topic Review Guide**: Origins of Compartmentalization (Topic 2.11)

**To Think About**: What are some similarities and/or differences in compartmentalization between prokaryotic and eukaryotic cells? How did mitochondria and chloroplasts evolve from previously free-living prokaryotic cells via endosymbiosis? What is some evidence to support the claim the mitochondria and chloroplasts evolved through the process of endosymbiosis?

**Watch:** [AP Daily Video 2.11 Origins of Cell Compartmentalization](https://apclassroom.collegeboard.org/d/fvgckpq21n?sui=6,2)

**Read:** Pages 484-485, Biology in Focus

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

* [Guided Notes 2.11](https://docs.google.com/document/d/16G5nRqUvndZST0QknprTz7PfAHyTBEZPYpHPvvV5Yxc/edit?usp=sharing)
* [Slideshow Presentation](https://docs.google.com/presentation/d/1fxN5hAcg3ytSHk6-_BwBtWl9DfohuTq5BXNPd-2yAjg/edit?usp=sharing)
* Mr. Andersen’s [“Endosymbiosis” video](https://youtu.be/-FQmAnmLZtE)
* Sumanas, Inc: [The Evolution of Organelles](http://www.sumanasinc.com/webcontent/animations/content/organelles.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 | | | | |
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| Levels of Mastery | | | | *I can describe similarities and/or differences in compartmentalization between prokaryotic and eukaryotic cells. (Topic 2.11)* |
| **N** | **A** | **E** | **M** | **Questions You Should Be Able to Answer** |
|  |  |  |  | 1. **Compare** compartmentalization in eukaryotic and prokaryotic cells. |

| **Essential Knowledge:**  What You Absolutely Must Know and Understand | | | | |
| --- | --- | --- | --- | --- |
| Levels of Mastery | | | | *I can describe the relationship between the functions of endosymbiotic organelles and their free-living ancestral counterparts. (Topic 2.11)* |
| **N** | **A** | **E** | **M** | **Questions You Should Be Able to Answer** |
|  |  |  |  | 1. Ancestral cells that gave rise to mitochondria and chloroplasts. **Describe** the relationship these previously free-living ancestors have to these organelles. |
|  |  |  |  | 1. Examine diagrams of the mitochondria and chloroplast and use them to **provide structural evidence** that supports the claim that these organelles were once free-living cells. |
|  |  |  |  | 1. **Describe** the functional evidence that explains the relationship between the ancestral free-living cells that became mitochondria and chloroplasts and the organelles themselves. |

| Learn More: For more information about cell structure and function, use the links below:   * [CellCraft](http://www.carolina.com/teacher-resources/Interactive/online-game-cell-structure-cellcraft-biology/tr11062.tr): a game that lets you build a cell from scratch and then attempt to keep it alive * [Unlocking the Secrets of our Cells](http://www.nobelprize.org/mediaplayer/index.php?id=1781): a documentary from the Nobel Prize Foundation about discoveries relating to the structure and function of our cells * [The Cell and Its Organelles](http://www.nobelprize.org/educational/medicine/cell/game/): a game from the Nobel Prize Foundation that tests your knowledge of cell organelles * Mr. Andersen’s [“Cell Organelles” video](https://www.youtube.com/watch?v=aczbMlSMr8U) * [1974 Nobel Prize in Physiology and Medicine](http://www.nobelprize.org/nobel_prizes/medicine/laureates/1974/): awarded for “discoveries concerning the structural and functional organization of the cell.” |
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