**Topic Review Guide**: Cell Structure and Function and Compartmentalization (Topics 2.2 & 2.10)

**To Think About**: How do subcellular components and organelles interact and contribute to the function of the cell? What are the structural features of a cell that allow organisms to capture, store, and use energy? What are some examples of membrane-bound organelles in eukaryotic cells that compartmentalize intracellular reactions? How do internal membranes facilitate cellular processes? How might a change in the internal membranes or membrane-bound organelles affect the ability of eukaryotic cells to perform necessary functions?

**Watch:** [AP Daily Video 2.2 Cell Structure and Function](https://apclassroom.collegeboard.org/d/xvhuvodhtf?sui=6,2); [AP Daily Video 2.10 Compartmentalization](https://apclassroom.collegeboard.org/d/2aadsubqjq?sui=6,2);

**Read:** Chapter 4.3 and 4.4, Biology in Focus

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

* [Guided Notes 2.2](https://docs.google.com/document/d/13u_DSwyyHeuC6sFNXpszF53SPn7FZauMb8C0-KqwEzo/edit?usp=sharing)
* Guided Notes [2.10](https://docs.google.com/document/d/1rl9wi7prcTEfb-g9f03fPKE5gAd79tZkOKWIwTKQxH4/edit?usp=sharing)
* [Slideshow presentation](https://docs.google.com/presentation/d/1blno0MGb2Ooy8jMR53zopIkh_V6oCIv6p2ZTYVVZ9yw/edit?usp=sharing)
* Mr. Andersen’s [“Compartmentalization” video](http://www.bozemanscience.com/017-compartmentalization)
* Harvard : [The Inner Life of the Cell](http://www.youtube.com/watch?v=wJyUtbn0O5Y)
* Crash Course Biology: [Eukaryopolis—The City of Animal Cells](https://www.youtube.com/watch?v=cj8dDTHGJBY)
* Sumanas, Inc: [The Evolution of Organelles](http://www.sumanasinc.com/webcontent/animations/content/organelles.html)
* Wiley Publishing: [Cell Structure](http://www.wiley.com/legacy/college/boyer/0470003790/animations/cell_structure/cell_structure.swf)
* Crash Course Biology: [Plant Cells](https://www.youtube.com/watch?v=9UvlqAVCoqY)
* Cells Alive!: [Interactive Cell Models](http://www.cellsalive.com/cells/3dcell.htm)
* Florida State-Molecular Expressions: [Animal Cells](http://micro.magnet.fsu.edu/cells/animalcell.html)
* Florida State-Molecular Expressions: [Bacterial Cells](http://micro.magnet.fsu.edu/cells/bacteriacell.html)
* Florida State-Molecular Expressions: [Plant Cells](http://micro.magnet.fsu.edu/cells/plantcell.html)
* The Biology Place BioCoach: [Cell Structure and Function](http://www.phschool.com/science/biology_place/biocoach/cells/intro.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 after in-class activities and before quizzes, 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 explain how subcellular components and organelles contribute to the function of the cell. (Topic 2.2)* |
| **N** | **A** | **E** | **M** | **Questions You Should Be Able to Answer** |
|  |  |  |  | 1. The function of each cell organelle is vital to the survival of the cell. **Describe** what would happen to the cell if the following organelles were faulty or absent: 2. Mitochondria 3. Chloroplast 4. Vacuole |
|  |  |  |  | 1. The endomembrane system in eukaryotic cells is a complex network of internal membranes with multiple jobs in the cell. **Explain** howeach of the following organelles that comprise this system aids in the functioning of the eukaryotic cell.    1. Rough endoplasmic reticulum    2. Golgi Apparatus    3. Lysosome |
| **Essential Knowledge:**  What You Absolutely Must Know and Understand | | | | |
| Levels of Mastery | | | | *I can describe the membrane-bound structures of the eukaryotic cell. (Topic 2.10)*  *I can explain how internal membranes and membrane-bound organelles contribute to compartmentalization of eukaryotic cell functions. (Topic 2.10)* |
| **N** | **A** | **E** | **M** | **Questions You Should Be Able to Answer** |
|  |  |  |  | 1. **Explain** what is meant by compartmentalization. |
|  |  |  |  | 1. **Describe** how membranes minimize competing interactions. |
|  |  |  |  | 1. **Explain** how the structure of the mitochondria is suited for its function of energy production for the cell. |
|  |  |  |  | 1. **Explain** how compartmentalization increases efficiency in eukaryotic cells. |
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| 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 [“A Tour of the Cell” video](http://www.bozemanscience.com/a-tour-of-the-cell) * [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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