**Topic Review Guide**: Plasma Membranes and Membrane Permeability (Topics 2.4 and 2.5)

**To Think About**: How does the structure of a phospholipid establish and maintain the internal environment of the cell? What role do phospholipids have in maintaining the internal environment of the cell? What role do proteins have in maintaining the internal environment of the cell? What is the structural framework of the Fluid Mosaic Model of cell membranes? How does the structure of cell membranes result in selective permeability? How do cell membranes separate the internal environment of the cell from the external environment? What is the direct consequence of membrane structure, as described by the fluid mosaic model? What type of molecules passes freely across the membrane? What type of substances moves across the membrane through embedded channels and transport proteins? What molecules pass through the membrane in small amounts? What type of boundaries do cell walls provide? What types of molecules are the cell walls of plants, prokaryotes, and fungi composed of?

**Watch:** [AP Daily Video 2.4 Plasma Membranes,](https://apclassroom.collegeboard.org/d/j8a9edp546?sui=6,2) [AP Daily Video 2.5 Membrane Permeability](https://apclassroom.collegeboard.org/d/2qa7jfm8fv?sui=6,2)

**Read:** Chapter 5.1 - 5.2, Biology in Focus

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

* Guided Notes [2.4](https://docs.google.com/document/d/1TTPMARU78Le5SQ5bfe2UCtNdgqKzqn8F5dzAQXlqW1s/edit?usp=sharing), [2.5](https://docs.google.com/document/d/1DAV-fVEbWM8vc3L0MQhdEjc07W9WhjX3U8vLY0FLIYg/edit?usp=sharing)
* [Slideshow Presentation](https://docs.google.com/presentation/d/1EbhFE_vIGgwun6AiZjRYIfxrE17PyKK4tXrymB_CewI/edit?usp=sharing)
* [Mr. Andersen’s “Cell Membranes” video](https://www.youtube.com/watch?v=y31DlJ6uGgE)
* BFW Publishers: [Principles of Life Chapter 5 Online Resources](http://bcs.whfreeman.com/hillis1e/#667501__669665__)
* Crash Course Biology: [In Da Club—Membranes and Transport](http://www.youtube.com/watch?v=dPKvHrD1eS4&list=EC3EED4C1D684D3ADF)
* Pearson BioCoach: [Membrane Structure and Transport](http://www.phschool.com/science/biology_place/biocoach/biomembrane1/intro.html)
* BioNinja: [Membrane Structure](http://ib.bioninja.com.au/standard-level/topic-1-cell-biology/13-membrane-structure/)
* Hyperphysics:  [The Cell Membrane](http://hyperphysics.phy-astr.gsu.edu/hbase/Biology/celmem.html)
* BioMan: [Cell Defense--The Cell Membrane (game)](https://biomanbio.com/HTML5GamesandLabs/Cellgames/celldefensehtml5page.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 the roles of each of the components of the cell membrane in maintaining the internal environment of the cell. (Topic 2.4)* |
| **N** | **A** | **E** | **M** | **Questions You Should Be Able to Answer** |
|  |  |  |  | 1. **Explain** why the amphipathic quality of a phospholipid is ideal for the construction of cell membranes. |
|  |  |  |  | 1. **Describe** how proteins play a role in maintaining the internal environment of the cell. 2. **Describe** the role of cholesterol in maintaining the cell membrane’s structural integrity. |
|  |  |  |  | 1. **Describe** what role carbohydrates play in the cell membrane. |

| **Essential Knowledge:**  What You Absolutely Must Know and Understand | | | | |
| --- | --- | --- | --- | --- |
| Levels of Mastery | | | | *I can describe the fluid mosaic model of cell membranes. (Topic 2.4)* |
|  |  |  |  | 1. Using the components of the cell membrane, **explain** why the cell membrane is referred to as a “fluid mosaic model.” |
| **Essential Knowledge:**  What You Absolutely Must Know and Understand | | | | |
| Levels of Mastery | | | | *I can explain how the structure of biological membranes influences selective permeability. (Topic 2.5)* |
|  |  |  |  | 1. **Explain** why molecules such as oxygen and CO2 are able to cross the cell membrane freely but large polar molecules and ions cannot? |
| **Essential Knowledge:**  What You Absolutely Must Know and Understand | | | | |
| Levels of Mastery | | | | *I can describe the role of the cell wall in maintaining cell structure and function. (Topic 2.5)* |
|  |  |  |  | 1. **Create** a Venn Diagram that illustrates the differences and similarities in the cell walls for the following organisms:    1. plants    2. fungi    3. bacteria |

| Learn More: For more information about membrane structure and function, use the links below:   * [OsyOsmosis](http://www.osyosmosis.com/): A game that allows you to control a character, Osy, by controlling how much water she takes up from her environment * [Nobel Prize in Chemistry, 2003](http://www.nobelprize.org/nobel_prizes/chemistry/laureates/2003/announcement.html): Peter Agre and Roderick MacKinnon, “for discoveries concerning channels in cell membranes.” |
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