

## Honors Biology Syllabus - Unit 2: Cell Structure and Function

### Essential Questions:

1. What are the various parts of cells and what do those parts do?
2. How do membranes play a key role in the survival of cells?

### Required Reading:

- Chapter 3 (All)

### Classwork:

- Surface Area to Volume Ratio Exploration
- Introduction to Cells - Videos & Questions
- Cell Parts: Structure and Function Worksheet
- "Organelle in Chief" Project
- Membrane Modeling Activity

### Homework:

- Unit 2 Vocabulary Checklist
- Microscope Skills Activity
- Evolution 60 Video & Writing Prompt
- Diffusion Demo Video & Question

### Labs:

- Lab: Observing Living Cells
- Membrane Function Inquiry Investigation

### Quizzes:

- Membrane Structure and Function Quiz

### Unit Assessment - "Organelle in Chief" Project:

- Daily Participation and Presentation Points (20 pts in **Class Work**)
- Cell Parts: Structures & Functions Worksheet (15 pts in **Science & Engineering Practices**)
- "Organelle in Chief" Project (30 pts in **Unit Exams & Quizzes**)

### Schedule: (See "Weekly Outline" on course website for potential adjustments)

| Date                             | Lesson Topics   | Assignments   |
|----------------------------------|---|---|
| <b>Block Day</b><br><b>09/19</b> | -Distribute Unit 2 Vocabulary Checklist   | -Unit 2 Vocabulary Checklist (Due Thursday, 10/17)<br><b>Homework</b><br>-"Why Are Cells Small?" Video & Writing Prompt (Due Friday, 09/20)           |
| <b>Friday</b><br><b>09/20</b>    | -New Seating Arrangement<br>-Discuss Unit 2 Syllabus<br>-Surface Area to Volume Ratio Exploration | -Surface Area to Volume Exploration (Due in class)<br><b>Homework</b><br>-Work on Current Event Summaries (Due Monday, 10/07)                         |
| <b>Monday</b><br><b>09/23</b>    | -Explore Cell Size and Scale<br>-Introduction to Cells - Videos & Questions                       | -Introduction to Cells - Videos & Questions (Due in class)<br><b>Homework</b><br>-Read 3.1 & Define Key Terms on Vocab Checklist (Due Tuesday, 09/23) |
| <b>Tuesday</b><br><b>09/24</b>   | -Notes: Cell Structure and Function   | <b>Homework</b><br>-Complete Microscope Skills Activity (Due Block Day)   |
| <b>Block Day</b><br><b>09/26</b> | -Lab: Observing Living Cells  | -Observing Living Cells Lab Handout (Due in class)<br><b>Homework</b><br>-"Evolution 60" Video and Writing Prompt (Due Friday, 09/27)                 |
| <b>Friday</b><br><b>09/27</b>    | -Discuss Endosymbiosis<br>-Introduce "Organelle in Chief" Project                                 | <b>Homework</b><br>-Read 3.2 & Define Key Terms on Vocab Checklist (Due Monday, 09/30)  |
| <b>Monday</b><br><b>09/30</b>    | -Watch Inner Life of a Cell Video<br>-Work on "Organelle in Chief" Project                        | <b>Homework</b><br>-Work on "Organelle in Chief" Project (Due Friday, 10/04)  |

| Date               | Lesson Topics   | Assignments   |
|--------------------|---|---|
| Tuesday<br>10/01   | -Work on "Organelle in Chief" Project   | <b>Homework</b><br>-Work on "Organelle in Chief" Project<br>(Due Friday, 10/04)   |
| Block Day<br>10/03 | -Work on "Organelle in Chief" Project<br>-Class Lab - Cell Structure Review           | <b>Homework</b><br>-Finish "Organelle in Chief" Project<br>(Due Friday, 10/04)  |
| Friday<br>10/04    | -No School - Conferences  | -Finish Current Event Summaries<br>(Due Monday 10/07)   |
| Monday<br>10/07    | -Confirm Current Event Summaries Completion<br>-Present "Organelle in Chief" Projects | <b>Homework</b><br>-Read 3.3 & Define Key Terms on Vocab Checklist<br>(Due Tuesday, 10/08)  |
| Tuesday<br>10/08   | -Present "Organelle in Chief" Projects  | <b>Homework</b><br>-Read 3.4 & Define Key Terms on Vocab Checklist<br>(Due Thursday, 10/10)   |
| Thursday<br>10/10  | -Membrane Modeling Activity   | <b>Homework</b><br>-Read 3.5 & Define Key Terms on Vocab Checklist<br>(Due Friday, 10/11)   |
| Friday<br>10/11    | -Notes: Movement of Materials Across Membranes  | <b>Homework</b><br>-Diffusion Demo Video & Question<br>(Due Monday, 10/14)  |
| Monday<br>10/14    | -Membrane Function Inquiry Investigation  | <b>Homework</b><br>-Develop Experimental Procedure on Blog<br>(Due Tuesday, 10/15)  |
| Tuesday<br>10/15   | -Finish Membrane Function Inquiry Investigation                                       | -Membrane Function Inquiry Investigation Report<br>(Due in class)<br><b>Homework</b><br>-Study for Membrane Structure & Function Quiz |
| Thursday<br>10/17  | -Quiz over Membrane Structure & Function  |   |
| Friday<br>10/18    | No School - End of 1 <sup>st</sup> Quarter  |   |

## Unit 2: Cell Structure and Function

### Learning Targets

- Explain how the Cell Theory contributes to our understanding of different cell types.
  - Differentiate between eukaryotic and prokaryotic cells.
  - Describe developments that led to the cell theory.
  - Discuss the main ideas of the cell theory.
- Describe the internal structure of eukaryotic cells.
  - Compare and contrast animal cells and plant cells.
  - Identify and describe the structure and function of eukaryotic cell organelles.
  - Explain the functions of and interactions between membrane bound cell organelles involved in the process of making and packaging proteins.
  - Explain the physical constraints that limit cell size.
  - Describe how symbiosis may have contributed to the origin of eukaryotic cells.
- Develop/use a model to describe the structure of the cell membrane and explain how the structure regulates movement of molecules across a membrane.
  - Describe the structure and function of cellular membranes.
  - Summarize how chemical signals are transmitted across the cell membrane.
  - Describe how passive transport occurs.
  - Explain the difference between active transport and passive transport.
  - Describe how large molecules move across a membrane.
  - Distinguish between osmosis, diffusion, and facilitated transport.
  - Relate osmosis to solute concentration.
  - Describe the relationship between diffusion rate and surface area.
- Plan and/or conduct an experiment to demonstrate how feedback mechanisms impact a living system.