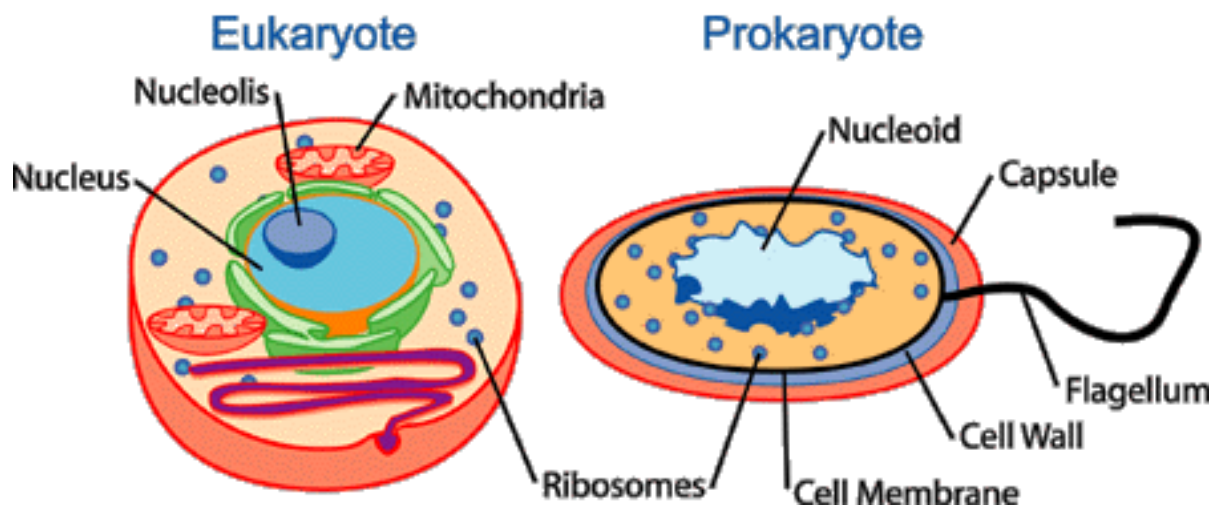


# Biology:

- Biology Foundations
- Cells



*“Biology gives you a brain, Life turns it into a mind” – Jeffrey Eugenides*

## Essential Understanding:

### Biology Foundations (review)

- Important molecules for biology
- Water and life

### Cells

- 1. Students will understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles
- 2. Students will understand how these cellular components are used to generate and utilize energy in cells
- 3. Students will understand the cellular components underlying mitotic cell division.
- 4. Students will apply their knowledge of cell biology to selected examples of changes or losses in cell function. These can include responses to environmental or physiological changes, or alterations of cell function brought about by mutation.
- Explain the unique properties of water that are essential to living organisms?

## Overview

This is an introductory lesson on how cells are the basic structure of all living things. Students are introduced to cells in a previous grade therefore prior knowledge is limited. Students will learn the basic cell organelles and the difference between plant and animal cells. Students will be engaged in close reading of an article, annotated note taking, and collaborative discussions.

## Guiding question 1: What are the fundamental units of life?

## Lessons

- \_\_\_\_\_ Week 6: Important Molecules for Biology (10/08)
  - Water & Life (10/02) (10/15)
- \_\_\_\_\_ Week 7: Introduction to Cells / Basic Cell Structures (10/15)
- \_\_\_\_\_ Week 8: Cell Membrane (10/22)
- \_\_\_\_\_ Week 9-11: Eukaryotic & Prokaryotic Cell (10/29)

## Individual Work

\_\_\_\_\_ Read the overview with your color group and mark it up with questions or comments. (10/08)

Read Khan Academy:

\_\_\_\_\_ Week 7: Important Molecules for Biology (10/08)

- Water & Life (10/15)

\_\_\_\_\_ Week 8: Introduction to Cells (10/15)

- Microscopy / Basic Cell Structures

\_\_\_\_\_ Week 9: Cell Membrane (10/22)

- Structure
- Fluid Mosaic Model

\_\_\_\_\_ Week 10: Eukaryotic v. Prokaryotic (10/29)

- Organelles
- Animals v. Plant cells

\_\_\_\_\_ Make vocabulary cards for the vocabulary in unit

\_\_\_\_\_ Reflect on the answer to Guiding Question 1. Update your mind map with the group presentation. (10/01)

## Group work/Lab work

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\_\_\_ Lab Write Up: Chemical Reaction Lab/Jello Lab due (10/22)

\_\_\_ Cells Group Project due (11/08)

\_\_\_ TBA: Will be announced in class and posted on Google Classroom a week in advance.

**Labs will be done in groups of 4 or 5.**

**Lab Handouts:** There will be a pre-lab for students to complete before the lab experiment, during the lab the students will gather the necessary data to complete the lab and answer the questions associated with the topic. After the necessary data is collected students will work on completing their lab notebook.

**Lab Notebook:** Every student is required to keep a lab notebook. The lab notebook will be each student's personal "copy". You will receive specific instructions on the lab notebook requirements.

This notebook will be graded on proper usage and completeness. *The lab notebook will be checked once a unit on the day of the assessment.*

**Formal Laboratory Report:** Each quarter students will put together a formally written laboratory report. This laboratory report is done individually (plagiarisms is not allowed). The report must be typed and include; Title, Purpose, Procedure, Materials, Observations, Data, Results, Conclusion and Citations.

### Assessment

\_\_\_ Individual assessment (11/15)

### Extension/Honors

- Research project- Stem Cells – ASSIGNED WEEKLY FROM PACKET

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*Vocabulary List*

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- **Biological macromolecule, Monomer, Polymer, Carbohydrates, Lipids, Proteins, Nucleic acid, Polar molecule, Cohesion, Adhesion, Density, Specific heat capacity, Heat of vaporization**
- **Cell, Microscope, Cell theory**
- **Organelle, Cell membrane, Cell wall, Cytoplasm, Ribosome, Flagella, Cilia, Pseudopodia**
- **Fluid mosaic Model, Phospholipid, Cholesterol, Glycoproteins, Glycolipid, Hydrophilic, Hydrophobic, Micelle, Liposome, Integral membrane, Transmembrane protein, Peripheral membrane proteins, saturated fatty acids, unsaturated fatty acids, semipermeable membrane**
- **Prokaryote, ribosome, nucleoid, peptidoglycan, cell wall, capsule, fimbriae, pili, surface-area-to-volume ratio**
- **Lysosomes, peroxisomes, linear chromosomes**
- **Endosymbiont theory, thylakoids, grana, chlorophyll, thylakoid space, lumen, stroma, cristae, mitochondrial matrix, intermembrane space, endosymbiosis**