

# Lesson Plan: Cell Organelle Campaign

By: Kim Castagna

**Target Grade:** 6

**Teacher Prep Time:** 40 minutes

**Lesson Time:** 4 hours and 30 minutes (We recommend doing this lesson over 5 + days.)

- Part 1:
  - 40 min – Introduction to Organelles
  - 10 min – Divide students into 10 groups and assign group organelles
- Part 2:
  - 100 min – Cell Organelle Research
- Part 3:
  - 50 min – Design Campaign Poster & 2 Minute Speech
- Part 4:
  - 50 min – Election Day Presentation of Campaign Speeches
  - 10 min – Collecting posters and research packets
- Part 5:
  - 10 min – And the Winner Is...

## Lesson Overview:

Students will begin by viewing a short video on the parts of a cell. While viewing, students will create quick sketches and list the functions for ten organelles. Students will randomly be assigned a cell organelle and create a campaign to get their cell organelle elected as “The Most Important Organelle in the Cell”. Students will plan their campaign by selecting an organelle running mate, conducting research on their organelles functions, and designing an informative poster with a slogan. Students will then present a 2 minute campaign speech and the class will vote for *The Most Important Organelle in the Cell*.

## Learning Objective(s):

- Students will identify key structures and functions of ten cell organelles.
- Students will obtain information by researching the functions of a given organelle and a complimentary second organelle.
- Students will communicate their organelle’s functions through a poster and a persuasive 2 minute speech.
- Students will be able to explain how two organelles work together to perform important cell functions.

**NGSS:** MS-LSS1-2 Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function.

## Performance Expectation

MS-LS1-2 Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function.

## Science and Engineering Practice

- #8 Obtaining, Evaluating and Communicating Information

- Communicate scientific and/or technical information (e.g., about a proposed object, tool, process, system) in writing and/or through oral presentations.
- **Disciplinary Core Idea**
  - MS-LS1.A Structure and Function
    - All living things are made up of cells. In organisms, cells work together to form tissues and organs that are specialized for particular body functions.
    - Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.
- **Crosscutting Concept**
  - #6 Structure and Function
    - The way in which an object or living thing is shaped and its substructure determine many of its properties and functions.
- **Common Core State Standard - ELA**
  - SL.6.4 Speaking and Listening/Presentation of Knowledge and Ideas
    - Present claims and findings (e.g., argument, narrative, informative, response to literature presentations), sequencing ideas logically and using pertinent descriptions, facts, and details and nonverbal elements to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation. CA a. Plan and deliver an informative/explanatory presentation that: develops a topic with relevant facts, definitions, and concrete details; uses appropriate transitions to clarify relationships; uses precise language and domain specific vocabulary; and provides a strong conclusion.
  - SL.6.5 Speaking and Listening/Presentation of Knowledge and Ideas
    - Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

### **Where This Lesson Fits in:**

This lesson should be taught after students learn that living things are made up of cells (unicellular or multicellular), which is the smallest unit of life (MS-LS1-1). After this lesson, students will learn that in multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (MS-LS1-3)

### **Materials Needed:**

- Apple TV with access to internet (or other technology to project video)
- Computer access for students (minimum 1 per group, 1 per student is not necessary, only use if available)
- Textbooks and other books students can use for cell organelle research
- Random selection cards with names of organelles (10 cards total, 1 organelle per card) *cell membrane, cytoplasm, ribosome, nucleus, endoplasmic reticulum (rough & smooth), golgi apparatus, mitochondria, chloroplast, vacuole, cell wall*
- Each student will need:
  - Cell Organelle Campaign Directions
  - Cell Organelle Campaign Ballot
  - Amoeba Sisters Video Note Taking Page
  - Cell Organelle Speech Listening Notes
  - Cell Organelle Research Note Page
  - Presentation Notes Page
  - Cell Organelle Campaign Grading Rubric
- Each group of students will need:

- Poster paper
- Set of markers & colored pencils

**Teacher Prep:**

- Download video “Amoeba Sisters: The Grand Cell Tour”.  
<https://www.youtube.com/watch?v=8IlzKri08kk>
- Upload “Cell Organelle Research Links” into Google Classroom or online platform for student access.
- Duplicate copies of directions & note taking pages 1/student and staple as a packet in the following order for easier rubric scoring: Directions, Research Note Taking, Presentation Notes, & Speech Listening Notes.
- Duplicate copies of Amoeba Sister Video Taking Notes 1/student.
- Duplicate copies of grading rubric 1/student.
- Duplicate and cut copies of Campaign Ballot in thirds 1/student.
- Make 10 selection cards with each organelle written on it.
- Group students into 10 groups.
- Create a certificate or prize for winning organelle team.

**Lesson Sequence:**

\* For this activity it is recommended that students be divided into 10 groups since there are 10 organelles. If you want less students in each group, you can add additional organelles.

<b>Part 1:</b>	
40 minutes	<p><b>Introduction to Organelles</b></p> <ul style="list-style-type: none"> <li>▪ Tell students we will watch a video to introduce us to our next topic of cell organelles.</li> <li>▪ Show the video “Amoeba Sisters: The Grand Cell Tour” (9:26 minutes) all the way through to give students an overview of Modern Cell Theory, prokaryote and eukaryote cells, and the organelles and their functions.</li> <li>▪ Distribute Amoeba Sisters Video Note Taking Page (1/student).</li> <li>▪ Tell students you will show the video one more time and instruct them on how to fill out the note taking page.</li> <li>▪ Re-watch the video pausing after each section for students to quickly sketch and write down the function of each organelle.</li> </ul>
10 minutes	<p><b>10 Organelle groups</b></p> <ul style="list-style-type: none"> <li>▪ Explain we will now explore cell organelles more by running a campaign similar to a presidential campaign.</li> <li>▪ Divide students into 10 groups (either teacher selected or self-selected).</li> <li>▪ Have student groups draw their random organelle card. This will be the organelle they will be the campaign manager for as they argue their place as “The Most Important Cell Organelle”.</li> <li>▪ Allow students to use the remaining time to discuss initial ideas about their organelle and be ready to begin research the next class period.</li> </ul>
<b>Part 2:</b>	

<p>100 minutes</p>	<p><b>Cell Organelle Research</b></p> <ul style="list-style-type: none"> <li>▪ Have students divide into their 10 organelle groups and get computers.</li> <li>▪ Pass out the Cell Organelle Campaign directions/note taking packet to each student.</li> <li>▪ Project the directions and read through them with the students, making sure all groups understand the requirements for the research, poster and presentation.</li> <li>▪ Show students the research link that has been posted to their Google Classroom. Make sure students have access to textbooks, or any other research books that can be used in the classroom.</li> <li>▪ Allow students to use the remaining time to work together to research their organelle and select a running mate.</li> <li>▪ Instruct students to tell you when they have completed their research and show you their completed notes.</li> <li>▪ At this point, get all students' attention to review the poster expectations listed on the direction page.</li> <li>▪ Pass out poster paper to groups that are ready to start creating their poster.</li> <li>▪ Monitor students' progress and assist and direct where needed.</li> </ul>
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<p><b>Part 3:</b></p>	
<p>50 minutes</p>	<p><b>Design Campaign Poster &amp; 2 Minute Speech</b></p> <ul style="list-style-type: none"> <li>▪ Project the grading rubric for all to see and walk through the expectations</li> <li>▪ Allow students to use the remaining time to work together to complete their campaign poster.</li> <li>▪ Once a group has completed their poster, the students will compose (on the Presentation Notes Page) and practice their 2 minute speech/presentation, making sure all members are participating.</li> <li>▪ Monitor students' progress and assist and direct where needed.</li> <li>▪ Walk around and ensure each student has a speaking part in the presentation.</li> </ul>

<p><b>Part 4:</b></p>	
<p>50 minutes</p>	<p><b>Election Day</b></p> <ul style="list-style-type: none"> <li>▪ Have students get into their 10 organelle groups and get their campaign posters.</li> <li>▪ Allow about 5 minutes for groups to practice their campaign speech/presentation.</li> <li>▪ Have students turn to the Cell Organelle Speech Listening Notes in their packet.</li> <li>▪ Project the Listening Notes and review expectations for completion with the students.</li> <li>▪ Review the Grading Rubric with students, emphasizing the section about all members of the team participating and showing good eye contact. Note that the students' Listening Notes will be included in their own final grade.</li> <li>▪ Call up student groups one at a time to present their campaign speech/presentation. Remind students in the audience that they should listen</li> </ul>

	<p>and observe carefully to complete the Listening Notes section for each organelle presented.</p> <ul style="list-style-type: none"> <li>▪ As the organelle groups are presenting, the teacher will score each student on team participation, voice projection and individual eye contact.</li> <li>▪ Allow the audience to ask questions after each presentation.</li> <li>▪ When the last organelle has been presented, tell the students that you will now pass out the voting ballots.</li> <li>▪ Explain to students that they can vote for 2 organelles that they think are the “best”. Explain that they can vote for themselves (if they want) and one other organelle.</li> <li>▪ Explain the method for ballot collection. I find these methods work well: <ul style="list-style-type: none"> <li>▪ folded and placed in center of table or</li> <li>▪ placed in “election box”</li> </ul> </li> <li>▪ Have students vote and place their ballots where designated for collection.</li> </ul>
10 minutes	<p><b>Collecting Posters &amp; Work from Groups</b></p> <p>** Depending upon how long the presentations and voting take, this may need to be done the following day.</p> <ul style="list-style-type: none"> <li>▪ Pass out the grading rubric to each student to be stapled on top of their work packet.</li> <li>▪ In campaign groups, students will place all work packets on top of the campaign poster and place the group’s work where designated in the classroom.</li> </ul>

<b>Part 5:</b>	
10 minutes	<p><b>And the Winner is...</b></p> <ul style="list-style-type: none"> <li>▪ Announce the winner of “The Most Important Organelle in the Cell” the next day and present certificate or prize.</li> <li>▪ Have the students who voted for the winning organelle share their reasoning as to why they voted for that candidate.</li> </ul>

**Teacher Background Content:**

The Inner Life of a Cell – Video by Harvard Medical 3:12 minutes (not narrated)

<https://www.youtube.com/watch?v=wJyUtbn005Y>

This video would also be a great way to begin your lesson on cells as phenomena. Then could show again at the end of the unit and try to identify the organelles as shown.

**Example Student Work:**

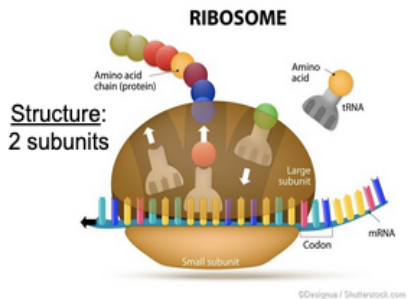
Presentation slides from SCSP online institute

# Ribosomes - The Great Synthesizers

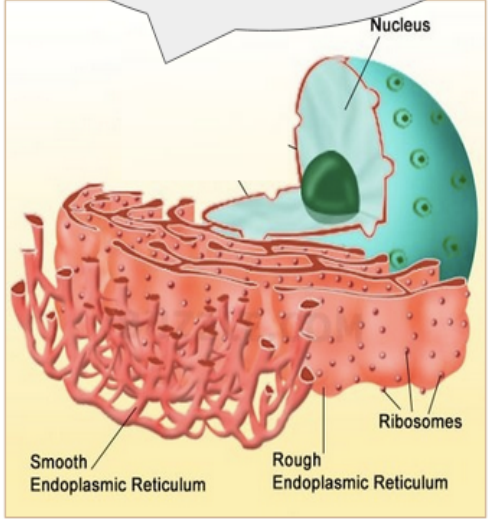
“We work to build the very foundation of life.”

**Function:**  
Make proteins

“Ribosomes are important because they produce proteins **essential** for cellular activity.”  
EducationSeattlePie.com



**Mitochondria**  
- Powers the cell!



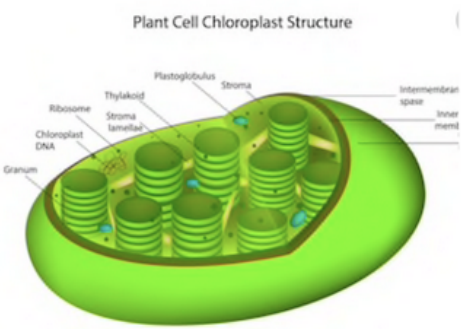
**Prokaryotes AND Eukaryotes:**  
Involved in all aspects of life.  
Take requests from the constituents & carry out the task (they get things done!)

# “It is easy being Green”

I am the chloroplast I give cells the energy needed to grow and reproduce. My waste product is oxygen which animals need to live. I provide the basis of the food chain.

## CHLOROPLAST FOR PRESIDENT

I have a double membrane which protects me. I contain chlorophyll on my thylakoids which capture and store light energy from the sun.



Function: I have chlorophyll which absorbs sunlight and uses its energy to form food from water and carbon dioxide in a process called photosynthesis.

Running Mate: Vacuole - I am here to support President Chloroplast by taking care of her needs such as water, nutrients, and protecting her from waste products.

Running Mate: Vacuole



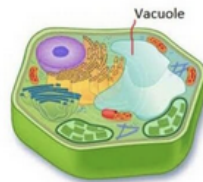
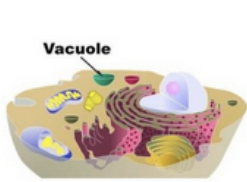
**Chloroplasts - Leise, Rebecca, Cary, Donna**



VOTE FOR

*Cell Membrane and Vacuole in 2020!*

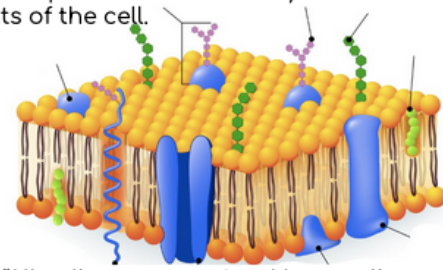
*Holding it all Together  
(Make Cells Great Again!)*



Drain the Swamp! We promise to selectively admit and expel contents of the cell.

Representation of plants AND animals! Serving plants' and animals' needs for storage, whether it's multiple small storage area or one large.

This message was approved by the campaign to elect cell membrane for present.



"All cells are contained by a cell membrane that keeps the pieces inside."  
Biology4kids.com

**Donate Today**

You can make a difference

## Nucleus with Nucleolus - Kandie, Beth, Janis and Laura

### An Organelle You Can Function With

**Why it is important:** The nucleus is the defining feature of all eukaryotic cells. Without a nucleus to direct the cell parts, it wouldn't be able to function. It houses the DNA, which tells the organelles and the cell what to do. Through transcription and translation the the nucleus helped with the evolution of complex organisms.

**Why they are a good team:** They need each other

**Important structures:** Double membrane, nuclear pores

**Function:** Stores hereditary info (DNA)

### Quoted information found in research

According to Ducksters Science for Kids "the nucleus is the brains of the cell. It uses chromosomes to instruct the rest of the cell what to do next."

### Nucleus

#### Structure:

- Double membrane
- Nuclear pores (allow RNA and ribosomes to move out of nucleus)

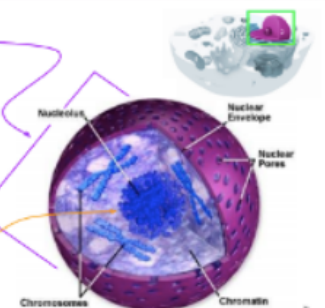
#### Function:

- Stores hereditary info. (DNA)

### Nucleolus

#### Function:

- Where **ribosomes** are made





Name: \_\_\_\_\_

## Amoeba Sisters: The Grand Cell Tour Video Notes

Cells that are unicellular are: 1 celled

Cells that are multicellular are: many celled

Prokaryote cells have No nucleus and Eukaryote cells do have a nucleus.

Cell Organelle	Quick Sketch	Function
Cell Membrane		Keeps things in cell stable, lets molecules in
Cytoplasm		Jelly like material surrounds + supports organelles
Ribosomes		make protein, float free or attach to ER
Nucleus		Big boss, cell headquarters holds DNA, control cell activity
Endoplasmic Reticulum	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Rough</p> </div> <div style="text-align: center;"> <p>Smooth</p> </div> </div>	Processes + transports molecules
Golgi Apparatus		has enzymes + decides where to send mo
Mitochondria		Powerplant makes ATP energy
Chloroplasts		make glucose (food for plants) through energy from the sun (photosynthesis)
Vacuole	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> </div>	Storage of materials plants - large
Cell Wall		protection + shape maintenance