

Lesson Title: Make Your Own Pie Cell

Lesson Overview: Students will create an edible model of an animal or plant cell.

Topic(s): Matter and Its Interactions

Grade or Grade Band: 5th Grade

Lesson Objectives: This lesson is an introduction to the idea of life at the cellular level. Students will be exposed to the vocabulary of the structures of a cell. Exposure to this lesson will lay the foundation for development of the concept of the cell as the smallest unit of life.

Next Generation Science Standards:

PS1.A: Structure and Properties of Matter

- Matter of any type can be subdivided into particles that are too small to see, but even then, the matter still exists and can be detected by other means.

North Dakota Standards: 5-PS1-1 Develop a model to describe that matter is made of particles too small to be seen.

Time Needed (estimate): 2- 30 minute sessions

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Preparation/Materials

Background knowledge students must have to be successful:

5th graders may have very little experience with life at the cellular level. This lesson is designed as an introduction and students are not expected to fully understand cell life. Exposure to the idea of cell life will help scaffold information they will learn at the middle school level.

Differentiation and accommodation to support learning for all students:

- Students may need extended time to research organelle functions.
- The teacher could provide organelle functions and ask students to match them with the correct organelle.

Essential terminology:

- Cell wall- support and protection, gives the cell its shape
- Cell Membrane- a flexible boundary that separates the cell from the outside environment.
- Cytoplasm-a gel like substance that holds all of the organelles.
- Nucleus-Contains the DNA and controls all cell activities
- Nucleolus-uses proteins to make ribosomes
- Mitochondria- breaks down sugar to create energy
- Lysosome- store digestive enzymes
- Vacuole- storage area of the cell
- Endoplasmic reticulum- folds proteins
- Golgi apparatus- processes and sorts proteins for transport
- Ribosome- makes proteins
- Chloroplasts-captures energy from the sun and uses it to produce food for cells.
- Central vacuole- water filled storage region that helps a cell keep its shape

Resources:

Websites:

Pie Cell Model: <https://youtu.be/JvrNtvDTD44>

Cells Alive Simulation: https://www.cellsalive.com/cells/cell_model.htm

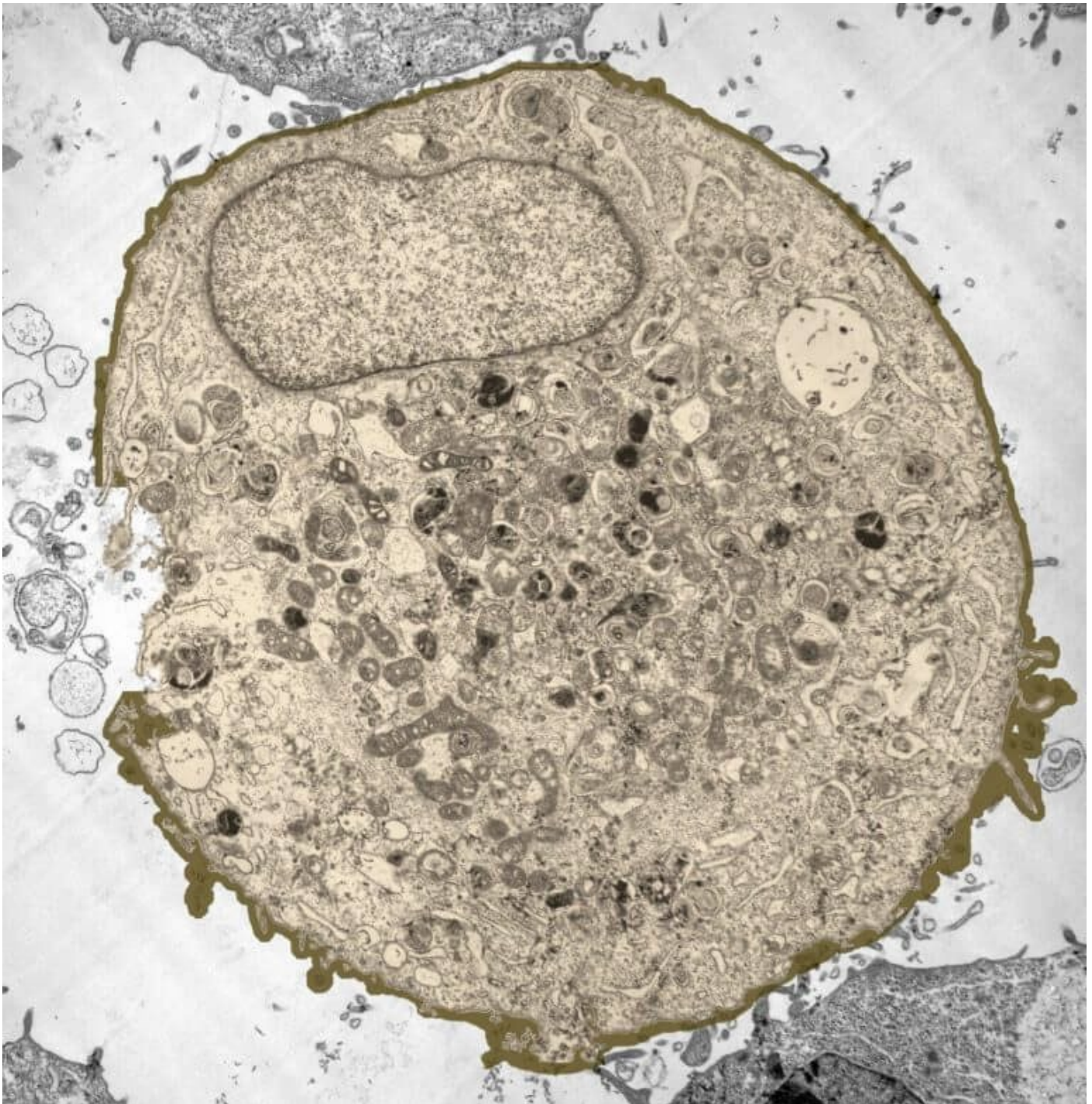
Materials needed:

- | | | |
|----------------------------|----------------|---------------------|
| • Graham cracker pie crust | • Peanut M&Ms | • Cinnamon Red hots |
| • Pudding | • Regular M&Ms | • Icing in a tube |
| | • Life Savers | • licorice |

Procedure/Activities

Engage:

Display the image of the animal cell below. Give students a few moments to brainstorm a list of ideas of what they are looking at. After students have listed their own ideas, have them discuss their guesses with a neighbor. Allow students to share their ideas as a class. Students may guess that it is something microscopic. Once students have been allowed to make their guesses, tell them that this is a cell from an animal that has been magnified over 400 times!



Picture from The Greatest Garden (Enriquez et al., 2019)

Explore: Explain to students that every part of the cell in this picture has a certain function to help keep the animal cell alive. Allow students to explore the Cells Alive Eukaryotic Organelles online simulation: https://www.cellsalive.com/cells/cell_model.js.htm. Students should click on the red “Start the Animation” button. Students may choose to explore the Animal Cell or Plant Cell. As students are exploring, give them the “Parts of a Cell” graphic organizer. Using the list of organelles in the table, choose 10 of the organelles to list and define. Use the information from the Cells Alive simulation for the definitions on the graphic organizer.

Explain: Once students have listed and described 10 of the organelles on their “Parts of a Cell” graphic organizer, instruct them to watch the “Make your Own Pie Cell”: <https://youtu.be/JvrNtvDTD44>. You may want to put students in small groups for this activity in order to save on materials. Each group will need the list of materials from the list at the beginning of this lesson plan. Each group of students should have their own device to ensure they are able to pause and rewind the video as they follow along to make their own Edible Pie Cell!

Once students have completed the Pie Cell, each group will need to take a picture of the pie cell and paste it to the center of their “Parts of a Cell” graphic organizer. They may then need to watch the video again as they work to draw a line from each organelle in the picture to its name and function.

Extensions for learning more about this topic:

- Extend this lesson into Social Studies by reading about how Robert Hooke made the first microscope and discovered cells in 1663.
- Create a writing assignment for students with the following prompt: “Our bodies are made up of trillions of tiny cells. Explain why you think it is important for cells to be tiny”

Evaluation:

Students should be evaluated based on appropriate labeling of the cell parts. At this age level, students should not be tested on or expected to memorize the parts of a cell.

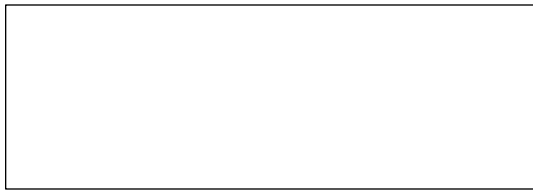
Additional Lesson Resources / Materials

References:

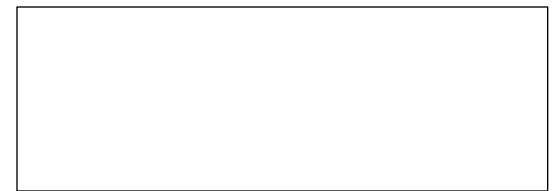
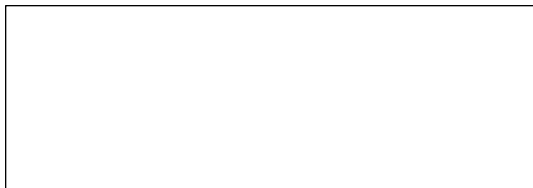
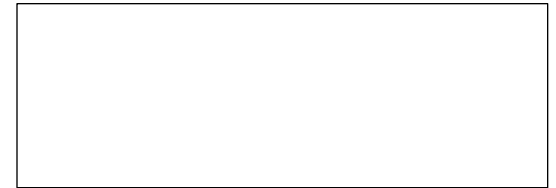
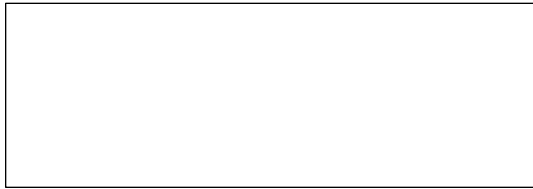
Enriquez, J., Gavison, T., & Lipton, M. (2019, March 5). *Animal cell under light microscope observation*. The Greatest Garden. Retrieved June 10, 2022, from <https://www.thegreatestgarden.com/animal-cell-light-microscope-observation/>

Parts of a Cell

Name:



Place a picture of your finished cell model here.
Write the name and function of each organelle in one
of the boxes. Draw a line to the organelle in your picture.



Parts of a Cell

Name:

Edible Cell Model

Project Description

Construct and clearly label a cell model

You may choose to construct an animal cell or a plant cell

Animal Cell	Plant Cell
Review the video from 1:06 – 4:05 https://youtu.be/JvrNtvDTD44	Review the video from 4:11- 4:05 https://youtu.be/JvrNtvDTD44
Research the functions of each of the following organelles: <ul style="list-style-type: none">• Cell Membrane• Cytoplasm• Nucleus• Nucleolus• Mitochondria• Lysosome• Vacuole• Endoplasmic reticulum• Golgi apparatus• ribosome	Research the functions of each of the following organelles: <ul style="list-style-type: none">• Cell wall• Cell Membrane• Cytoplasm• Nucleus• Nucleolus• Mitochondria• Lysosome• Vacuole• Endoplasmic reticulum• Golgi apparatus• ribosome• chloroplasts• central vacuole

Record each organelle and its function in one of the boxes on the “Parts of a Cell” graphic organizer. Insert a picture of your cell model. Draw a line from the label to the organelle in your picture