

The Giant Cell Project

Objectives

Scenario: Students will create a giant cell model in our classroom. Student pairs will be assigned a cell part which will be built correctly to the appropriate scale for the giant cell model. Students will act as "set designers" for a new "hands-on" exhibit in a local science museum. To design their set, they must consider their target audience (10 year olds) as well materials that will be appropriate for a display that will remain in place for a few weeks.

Students correctly and accurately measure and calculate the size and dimensions of each cell part, based on the dimensions of the cell model.

Students will research the structure, shape and function of their assigned cell part using their online textbook and online resources found at www.drbowers.weebly.com.

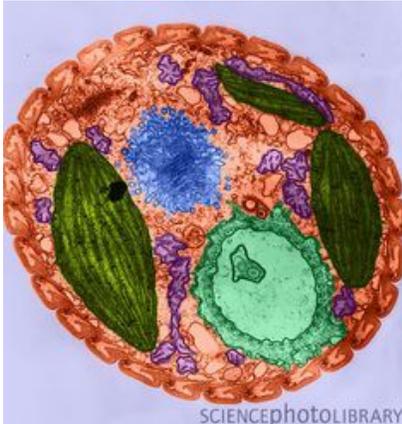
Each student group will teach the class the details of their cellular structure, using their model as a prop. Students will describe how their cell part works as well as what other parts of the cell may work together with their part.

Students will be assessed using MYP rubrics (for design, communication, and scientific knowledge). The ability to work cooperatively, positive attitude and demonstration of knowledge through presentation will be assessed according to the rubrics. In addition, students will be asked to complete peer reviews of student designs and presentations. At the completion of the project, students will take a quiz on the structures of a cell.

The GIANT CELL

ROLE

You are a scientific advisor to a local science museum and will be working on a team to create a cell model, as a part of an upcoming exhibit entitled "The Inner Life of a Cell".

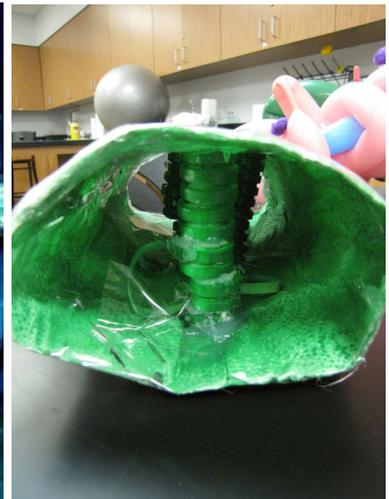
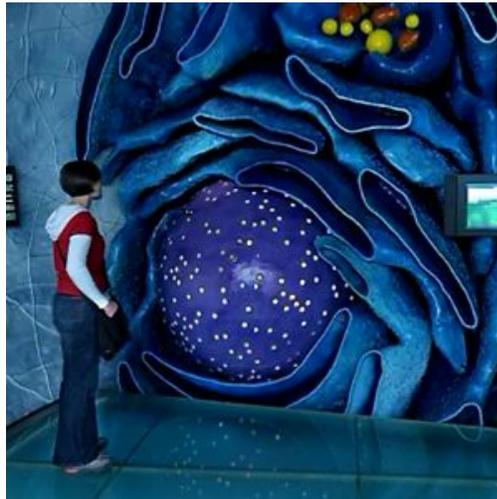


AUDIENCE

Your individual organelle will be presented to an audience of 10 year olds to help them understand cell parts and how they interact to perform specific functions. (Be prepared...we may have an ACTUAL audience of 10 year olds to visit your exhibit!).

FORM & TIMELINE

You will be required to build your cell part to scale in the room using various materials that you have collected from home. You will be given 3 class days (11/16, 11/18 and 11/20) in order to build your cell part as well as one class period (11/30) to finalize your designs and plan your presentations. Presentations will be given in class on 12/3A or 12/4B.



Construction

Directions:

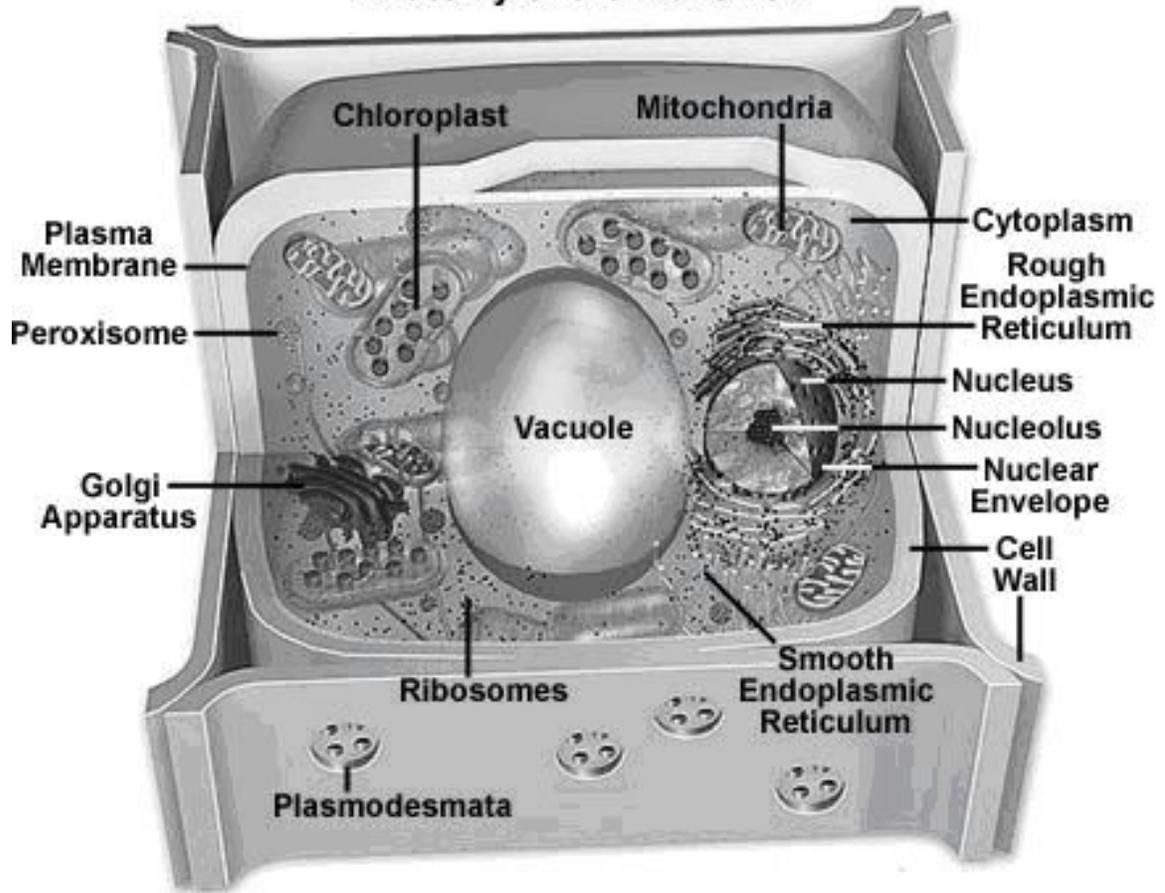
Identify the part given to your group. This is your cell part and you will make a model of your part to the scale of the model in the room. In order to complete your design, follow the instructions below:

1. Measure the length and width of your part on the cell diagram using a metric ruler with mm. Record this measurement under the **length of organelle** and **width of cell part** on your chart.
2. Measure the **length and width of the entire cell** on your cell diagram in mm. Record this measurement under the **length of the cell** and **width of the cell** on your chart.
3. Divide the length of your cell part by the length of the cell diagram. Record this number as your **conversion factor for the length of the organelle**.

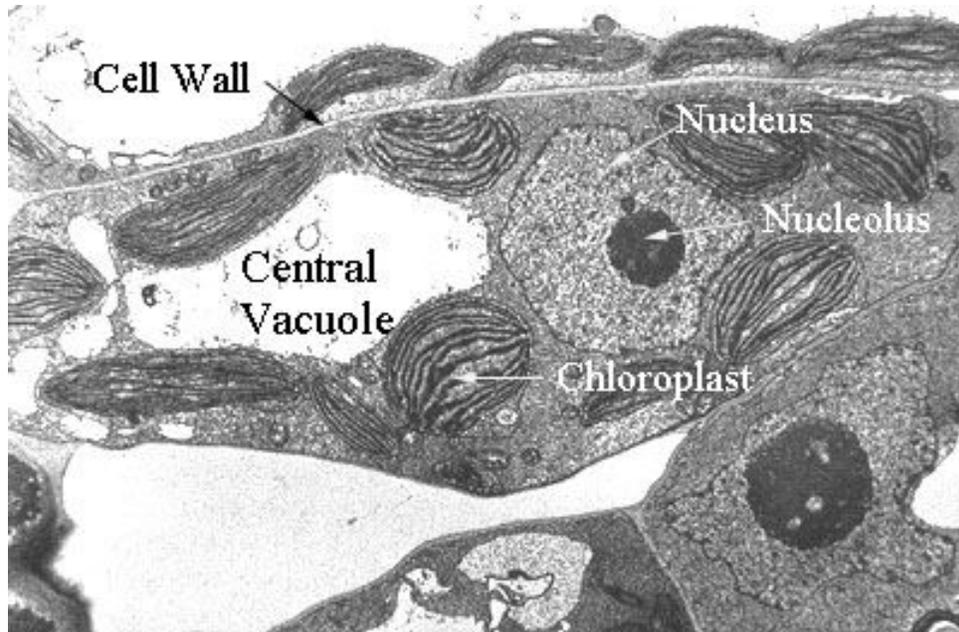
Example: length of nucleus: 33 mm
length of cell: 100 mm
 $33\text{mm}/100\text{mm} = 0.33$

4. Repeat step 3 using the width of the cell part and the width of the cell. Record this number as your **conversion factor for the width of the organelle**.
5. Multiply the conversion factors for length and width by the length and width of your cell model in order to calculate the "to scale" size of your part in the room. Record this number in the table under **length of organelle to scale** and **width of organelle to scale**.

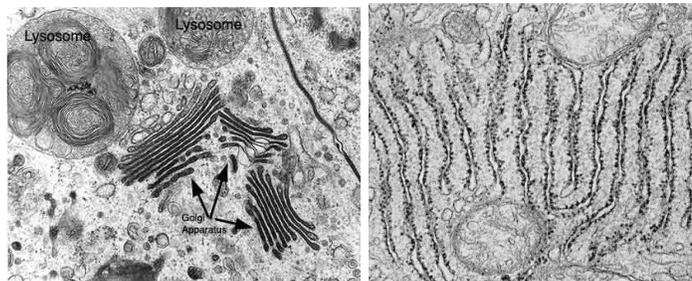
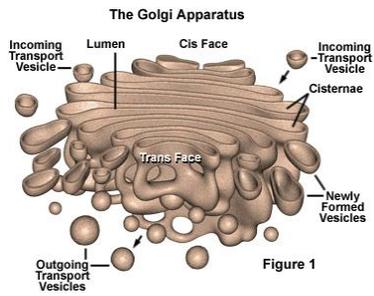
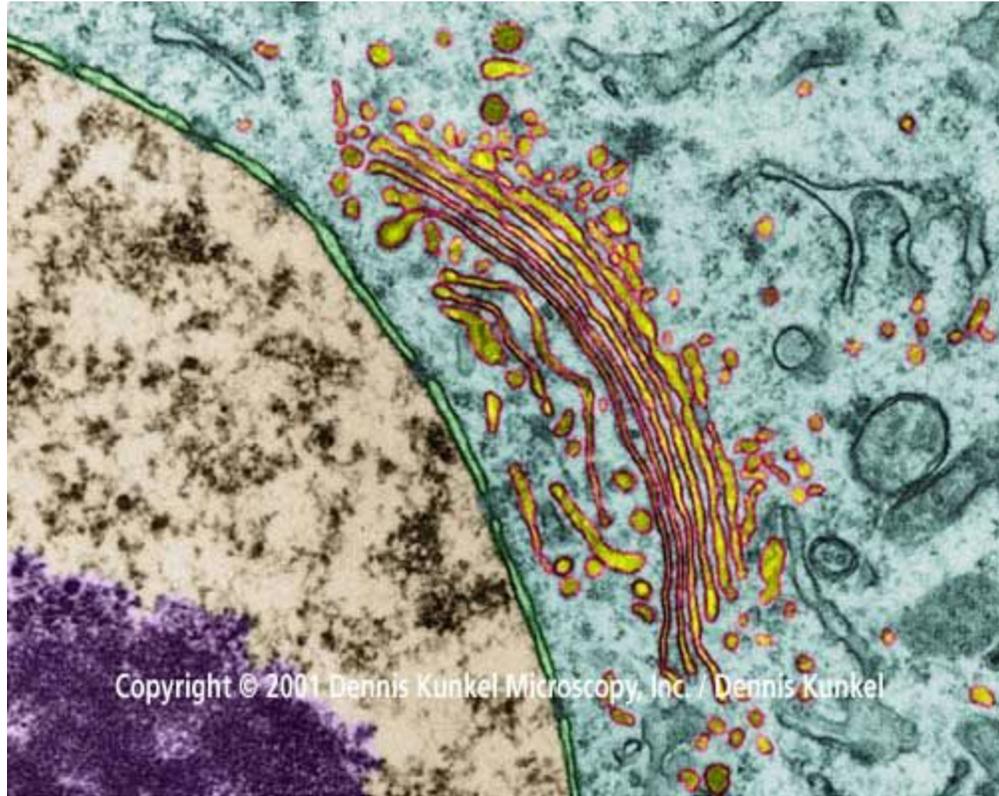
Anatomy of the Plant Cell



Electron Micrograph:



Transmission Electron Micrographs



Summary of Cell Part Sizes to Build

Cell Organelle	Length of Cell Part	Width of cell part
Nucleus		
Nucleolus		
Rough Endoplasmic Retic.		
Ribosome (single)		
Ribosome (polysome)		
Mitochondrion		
Chloroplast		
Vacuole		
Golgi Apparatus		
Cell Membrane		
Smooth Endoplasmic Ret.		
Lysosome		

What is your plan for building your cell part?

1. Who will you work with?
2. What materials will you use?
3. How will you construct your part?
4. Do you need any tools to do this?

Resources:

<http://micro.magnet.fsu.edu/cells/golgi/golgiapparatus.html>

http://www.rocklin.k12.ca.us/staff/dfix/zenith/handouts/organelle_pics.html