

3-D Cell Model

Objective: Make a 3-D model of a cell to learn about the structure and function of the cell and cell organelle.

Guidelines:

- A.) This project involves the construction and identification of a “typical” animal or plant cell.
- B.) Your cell must be 3- dimensional with front, back and sides.
- C.) All parts of your cell must be labeled clearly. This can be accomplished in 2 ways:
 - 1) Use toothpicks or straight pins and pieces of paper to make “flag” labels.
 - 2) Create an accurate legend utilizing pictures of the identified object or mounted examples.
- D.) Your organelles should clearly represent the actual organelle. By just looking at an organelle I should be able to tell what it is. **Ex: Your nucleus should not be square. Your mitochondria should have a folded inner membrane, etc.**
- E.) Actual numbers of organelles found in real cells should be represented. Ex: Each cell has one nucleus but animal cells have multiple mitochondria and other organelles.
- F.) Each organelle type should have its function clearly described and should be provided on a chart or table.
- G.) Be unique and creative! Use a variety of appropriate materials. Expense is not a consideration in the grade— BUT neatness, accuracy, and creativity are!
- H.) You must email me a close-up picture of your project before class on January 11th. Labeling and organelles must be visible in your picture. You may send multiple pictures from different angles if necessary.
- I.) All students must present their project in class on January 11th. The emailed picture can be used during your presentation rather than a live video camera stream. Conversely, you can present on camera exclusively without a sent picture if you prefer.

Organelles that **MUST** be included:

Typical Animal Cell	Check
1. Cell Membrane	
2. Cytoskeleton	
3. Cytoplasm	
4. Nucleus	
5. Nucleolus	
6. Nuclear membrane (show pores)	
7. Smooth Endoplasmic Reticulum	
8. Rough Endoplasmic Reticulum	
9. Ribosomes	
10. Golgi Body	
11. Mitochondria with Cristae	
12. Lysosomes	
13. Vacuole (plant cell)	
14. Cell wall (plant cell)	
15. Chloroplast (plant cell)	
16. Centriole (animal cell)	

Cell Model Grading Rubric

	Excellent 105-92	Satisfactory 91-80	Needs Improvement 79-75	Unacceptable < 74
Appearance 20-5pts.	Project stands out from the rest, shows evidence of considerable effort. Labels are typed or neatly written, project is organized, and organelle chart/ table is attractive and complete	Appearance is neat, labels are typed or neatly written, project is organized, and shows evidence of good effort w organelle chart/table that is neat and complete.	Labels are hard to read, project is not neatly done, more effort needed	Appears hastily built, lack of effort is evident.
Creativity 10-0pts.	Cell model uses materials that reflects thought and clearly represents effort. Project construct is unique.	Good, creative use of materials that are often used by other students	Minimal creativity is used; project is a poster or other 2-D model.	Lacks creativity, copied from diagram in book.
Details 30-5pts.	All organelles & cell parts are accurately detailed and clearly represented. Actual numbers of organelles are represented.	Most organelles & cell parts are accurately detailed and clearly recognizable.	More detail needed to recognize cell parts. Some are not recognizable. Numbers of organelles are somewhat representative of an actual cell.	Parts of cell are generalized "blobs" of color. Numbers of organelles are NOT representative of an actual cell.
Labeled Organelles 20-5pts.	All listed organelles are correctly located and referenced on legend or labeled on the model.	Most organelles are correctly located and labeled on the model.	Cell Model organelles are lacking or incorrectly labeled or positioned.	Required organelles are missing, incorrectly label, or incorrectly identified.
Functions of Organelles (on accompanying table or chart) 20-5pts.	Functions of all organelles are correctly described in detail.	Functions of all organelles are correctly summarized.	Functions of some organelles are summarized with minor errors.	Functions are not clearly explained or contain errors.