

CELL PROJECT

OBJECTIVES

1. Explain why cell size and shape varies.
2. Using the relationships between micrometers, millimeters, centimeters, and meters, explain how many times bigger the model is than the actual cell.
3. Distinguish between prokaryotic and eukaryotic cells.
4. Explain why compartmentalization is important in eukaryotic cells.
5. Compare the structures of plant and animal cells. Note the function of each cell part.
6. Describe the structure and functions of the **nucleus, endomembrane system, rough and smooth endoplasmic reticulum, Golgi apparatus, lysosomes and vacuoles.**
7. Describe the structure and functions of the **nuclear membrane, plasma membrane, cell wall and cytoplasm.**
8. Compare the structures and functions of **mitochondria** and **chloroplasts.**
9. Compare the structures and functions of **microfilaments**, and **microtubules** (collectively called the cytoskeleton).
10. Explain how the structure of **cilia** and **flagella** relate to their functions.

ASSIGNMENT

1. Construct a cell model that represents a single individual cell. The cell must be **specialized** – that is, you must choose a cell from either a plant or animal that has a specific task within the organism. The cell and each organelle within it must be constructed to scale. This may require a large model so please consider that the model must be transported to school. **YOU MUST ALSO INCLUDE A KEY THAT IDENTIFIES THE PARTS OF THE CELL.** The following are examples only:

cell from the retina of the eye
cell from the trunk of a tree

cell from the root of a plant
nerve cell from a fingertip

2. **This portion of the project must exhibit your creativity!**
In addition to the model, you must also design a piece **which explains the function of your cell** including how the cell contributes to the health of the organism as a whole. The exact function of at least twelve cell organelles must be included in your piece. You may construct a board game, write a story, poem or a play, draw a cartoon, produce a newscast or a power point presentation, design a game such as Jeopardy, write a song, rap or cheer, or present a debate, panel discussion, or talk show. This list only provides suggestions and is not meant to be exhaustive.
3. You must look at your work and reflect on the process of putting the project together and on the finished product itself. In your TYPED (at least $\frac{3}{4}$ page, no more than $1\frac{1}{2}$ page, double-spaced, Times New Roman, 12 pt font) reflection, feel free to include any thoughts you have about the project, but be sure to include **at least three** of the following. *Covering the first bullet point is mandatory.*
 - list of all cell organelles not included in your cell model and creative piece and explanation of their functions
 - your goal for the project and whether you achieved the goal or not
 - how you went about completing the project (Be specific!)
 - challenges and successes with the project
 - what you would do differently next time if you had to do the project over again
 - feedback about the project itself (Was the project beneficial/helpful to you? Why or why not?)

PROJECT RUBRIC

1. Demonstrates knowledge of objectives. Cell built to scale.	Points
a. Concrete connection between objectives and project	20
b. Good project but incomplete connection to objectives	16
c. Identifies objective but shows limited understanding	12
d. Fails to identify important elements or emphasizes unimportant elements	8
e. No apparent strategy and no effort	0
2. Effectively matches structure and function	
a. Exceeds expectations in explaining relationship between structure and function	20
b. Meets most expectations in explaining relationship between structure and function	16
c. Meets some expectations in explaining relationship between structure and function	12
d. Doesn't meet expectations	8
e. No effort	0
3. Creativity and Originality	
a. Gives clear evidence of a well thought out and inventive project; very original and creative.	20
b. Gives evidence of inventive project	16
c. Gives some evidence of project process but very "textbook-like"	12
d. Gives minimal evidence of project process and no creativity	8
e. No effort	0
4. Reflection	
a. Thoughtful and complete reflection	10
b. Complete reflection but lacks thought	8
c. Reflection present but incomplete	6
d. Sloppy with little reflection	4
e. No effort	0
TOTAL	70