**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Eukaryotic Cells 4 C’s Academic Project – 100 Points**

**This project outlines cells as living organisms. Be sure to note this project leaves space for expansion as we move into next unit. Pick your partner carefully! There is a component of artistic ability as well as following directions. Additionally, you will work with this partner as we expand the project into the next unit.**

**Part 1**

**PLANT CELL You will first do a rough draft of each cell. Then copy it over onto a sheet of computer paper to put onto a larger piece of poster board.**

* **Detailed illustration of the cell and organelles (8 pts)**
	+ One accurate drawing including each organelle (large central vacuole, nucleus, cell wall, cell membrane, ribosomes, cytoplasm, chloroplast, mitochondria)
	+ Detailed description of the function of each organelle listed above
* **Chloroplast (5 pts)**
	+ In the blank space beside the plant cell, draw a detailed larger zoomed view of a chloroplast with labels.
	+ Leave some space around organelle for expansion and information.
		1. What occurs in the chloroplast? Why is it green?
* **Mitochondria (5 pts)**
	+ In the blank space below the chloroplast on the poster board, draw a detailed larger zoomed view of a mitochondrion with labels.
	+ Leave some space around organelle for expansion and information.
		1. What occurs in the mitochondria? What organisms contain mitochondria in their cells?

**ANIMAL CELL**

* **Detailed illustration of the cell (8 pts)**
	+ One accurate drawing including each organelle ( vacuole, nucleus, cell membrane, ribosome, cytoplasm, mitochondria, centrioles)
	+ Detailed description of the function of each organelle listed above
* **Ribosome (7 pts)**
	+ In the blank space below the mitochondrion draw a larger zoomed in view of the organelle that is usually drawn as small dots inside cells.
		- Leave center of organelle hollow and not colored in. Describe what occurs inside of this organelle.
	+ Add arrows from the source of cell instructions in the plant and animal cell to the large ribosome. Label arrow “Instructions to build protein.”
		- Label the family of biochemical from Unit 2 that contains these instructions.
* **Cell Membrane (10 pts)**
	+ Using the paper models, illustrate a section of the membrane zoomed in
	+ Label a protein channel with function, Honors-label a carrier protein and its function, Both: Describe whether these proteins are for active or passive transport. Why?
	+ Both: Describe whether these proteins are for active or passive transport. Why?
	+ Using arrows show the movement of Oxygen, Water and Glucose across the membrane
	+ Make a key to show each substance moving across the membrane by PASSIVE TRANSPORT. Be sure you have enough molecules drawn to show high and low concentration.
	+ Name process involved for each substance.
	+ Under your membrane model, describe how active transport would be different from what you drew. Include a description of the direction of the movement of molecules and what is added to make the movement possible.

**Part 2 (Next Unit) Cell Energy**

* **Interdependence of Chloroplasts and Mitochondria (How the reactions are related)**
	+ Write the reactants of photosynthesis above the chloroplasts with an arrow going INTO the chloroplast **(2 pts)**
	+ On the other side of the chloroplast (above the mitochondria) write the product of photosynthesis with an arrow coming OUT OF the chloroplast. **(3 pts)**
		1. Add to your diagram the name of the family of biochemical from Unit 2 that is PRODUCED by this process.
	+ Draw a large bracket around all of the above and label it Photosynthesis **(1 pt)**
	+ Draw an arrow from the products of photosynthesis INTO the mitochondria **(1 pt)**
	+ On the other side of the mitochondria, write the products of respiration with an arrow coming OUT OF the mitochondria. **(3 pts)**
		1. Add to your diagram the name of the family of biochemical from Unit 2 that is BROKEN DOWN by this process. Honors-What other families of biochemical can be broken down by this process, EVEN THOUGH they are not shown in the overall equation for the process.
	+ Draw a large bracket around all of the above and label it Respiration. **(1 pt)**
	+ Finally, draw a large arrow from the products of Respiration all the way back to the top and to the reactants of Photosynthesis. **(1 pt)**

Add the following terms in appropriate places on your poster: Heterotroph, Autotroph, Protein Synthesis, Eukaryote **(5 pts)**

**Total Content Points: /60**

**Collaboration rubric:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Collaboration***Student plays an active role in getting group tasks organized and completed; demonstrates a willingness to help, listen, and contribute in order to create a positive and effective work environment.* | * Student demonstrates frustration and would not overcome obstacles to complete group tasks.
* Student refused to compromise or work with group members.
* Student did not contribute his/her ideas to the group.
* Student tried to silence others in the group; did not allow others to contribute their ideas.
* Student did not show effort in helping the group.
* Student wasted time and fooled around, distracting the group.
* Student did not fulfill all of his/her responsibilities in the group on time.
* Student absences negatively impacted the group’s progress
* Student was not willing to put in extra time and effort to help the group complete the tasks.
* Student did not show respect for his/her group members.
* Student had a negative attitude about being in his/her group.
 | * Student usually overcame obstacles and helped to complete group tasks.
* Student shows willingness to compromise, work with group members, and never argues.
* Student contributed his/her ideas to the group.
* Student listened to other group members’ ideas.
* Student helped the group.
* Student did not waste time, fool around, or distract the group.
* Student tried to fulfill all of his/her responsibilities on time, even when absent
* Student was willing to put in extra time and effort to help the group complete the tasks.
* Student showed respect for his/her group members.
* Student had a positive attitude about being in his/her group.
 | In addition to meeting the PROFICIENT criteria…* Student took a lead role in managing the group and the project expectations
 |
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**Creativity Rubric:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Creativity***Express and implement appropriate unique ideas while maintaining ethical standards* | * Information is presented in a standardized or previously-used format
* Student is unable to apply current research in a unique way
* Student only reformulates a collection of available or existing images.
* Poster is poorly drawn and messy/illegible
* Student sees only obvious superficial connections between ideas
 | * Information is presented in a novel or unique format
* Student applies current information in a unique way
* Images are well-drawn and neat
* Student makes associations between things not usually connected
 | In addition to meeting the PROFICIENT criteria…* Student creates entirely new depictions of organelles and their functions
* Student formulates conclusions based on associations that are not usually connected.
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**Collaboration points: /40**

**Final Grade :**