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

**Eukaryotic Cells 4 C’s Honors 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. Draw and label the Thylakoid membranes, Grana, and stroma. Describe the purpose of each
* **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. Draw and label the Matrix, inner membrane, intramembrane space. Describe the purpose of each.

**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.
    - Within the ribosome, draw the P and A sites within the large subunit of the organelle. Describe what fits into these sites? For what purpose?
  + Add arrows from the source of cell instructions in the plant and animal cell to the large ribosome. Label arrow “Instructions to build protein.”
    - If this cell were a prokaryotic cell, how would the path of these instructions to build proteins be different? Describe your answer on the model
* **Cell Membrane (10 pts)**
  + Using the paper models, illustrate a section of the membrane zoomed in
  + 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.
  + Include in your diagram a protein pump. Draw the appropriate concentration gradient and any molecules needed to make this process work. Describe whether this is active or passive transport.

**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. 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 analogies for each of the organelles on your poster (recall that you did these with the organelle stations at the beginning of the unit). Describe why these analogies work. **(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:**