**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 :**