Name: Partner: Class period:

**Cells and Me**

Cells help us sustain life. They are responsible for making up all living things.

For cells to do their jobs, they must be organized and efficient. **Cells contain small structures within them called organelles**. Organelles function like tiny organs to keep each cell alive. Most cells have the same organelles, but there are differences between plant and animal cells. These differences help the organism in specific ways.

You will **create a model** that promotes awareness among younger children of the importance of cells. You and your partner have been hired by the education department as consultants for this project. Think of your model as interactive, similar to board games, video games, or touch-screen devices. For your project to be considered by the education department, you must present a 3-D model of a cell with the following requirements:

* 3-D cell structure
  + A 3-D model of the plant or animal cell organelles, with a detailed description of the organelle and its function in the cell (the definitions and descriptions **cannot** be copied from the internet), and an image of the actual organelle.
  + What type of cell will you make a model for (circle one)? ANIMAL PLANT
  + List of organelles required (be sure to identify organelles that are only in animal cells or only in plant cells):
    - Cell membrane
    - Cell wall
    - Cytoplasm
    - Smooth endoplasmic reticulum
    - Rough endoplasmic reticulum
    - Mitochondria
    - Chloroplast
    - Nucleus
    - Lysosomes
    - Golgi apparatus
    - Vacuoles
* Interactive model: Using Scratch and Makey Makey (or alternative, approved technology)
  + You and your partner need to create your 3-D model so that it is interactive. You can use the programing site Scratch and your circuit board to accomplish this. The model must be touch-activated and can use voice recordings (must be yours or your partner’s), visual representations, or animations.
    - You must keep a detailed journal entry with your partner on Google Docs. Every day you will write about your experience.
* Cell respiration and photosynthesis
  + A visual representation and explanation of how your model obtains and uses energy.

**Group contract**

Your group should review the following contract and negotiate how you will complete it. Fulfillment of these contractual obligations will be part of your project participation evaluation. Each member of the group needs to complete the contract.You and your partner are required to research all organelles each and write/record detailed, one-minute descriptions of your organelles.

**Group policies**

Be sure to answer the following questions:

1.     What process will you use to resolve differences of opinion about your project?

2.    How will your group ensure that everyone is participating and contributing to the project equally and efficiently?

Fill out the table with your specific jobs for you and your partner:

|  |  |  |
| --- | --- | --- |
| Name | Job title | Job description |
|  |  |  |
|  |  |  |

**Rough draft of project**

Materials needed (remember that to be interactive, you need to use a conductive material for the Makey Makey):

The following questions will help you get started:

* What is my cell model made of?
* What is each organelle made of?
* How am I going to make my project interactive? What conductive materials will I use?
* How do I plan on explaining the function (job) of each organelle? Am I going to voice-record, make an animation, or something else?

**Daily journal entries**

You and your partner are both responsible for creating and maintaining a journal throughout this project. The journal will not only help you stay focused on your project, but will also help your teacher keep track of your progress.

Instructions

* Create a Google document with your school Google e-mail.
* Title the document: FirstName\_LastName\_TheCellsandMeJournal
* Title the page: The Cells and Me Daily Journal by Your Name
* Include your partner’s name.
* Use Times New Roman font, size 12.
* Number and date each journal entry.
* Each day, answer the following prompts:
  + What did you and your partner accomplish today?
  + What was one thing that went well today?
  + What is one thing you need to improve on?
  + What do you hope to accomplish tomorrow?
* Share the Google document with your teacher and submit it to Google Classroom.

**Academic content: Cellular structure and function**

Explanation of cellular respiration and photosynthesis:

* In your own words, what is cellular respiration?
* Where does cellular respiration occur?
* In your own words, what is photosynthesis?
* Where does photosynthesis occur? Why does it only occur in plants?
* What element is being cycled through photosynthesis and cellular respiration? How does it contribute to the sustainability of life? (You can draw a picture if it helps you.)

**Structure and function of plant and animal organelles**

|  |  |  |  |
| --- | --- | --- | --- |
| **Organelle** | **What is the function (the job) of the cell organelle?** | **Present in: (circle both or one)** | **How will you represent it in your model? What does it look like?** |
| **Cell membrane** |  | * Plant cell * Animal cell |  |
| **Cell wall** |  | * Plant cell * Animal cell |  |
| **Cytoplasm** |  | * Plant cell * Animal cell |  |
| **Smooth endoplasmic reticulum** |  | * Plant cell * Animal cell |  |
| **Rough endoplasmic reticulum** |  | * Plant cell * Animal cell |  |
| **Mitochondria** |  | * Plant cell * Animal cell |  |
| **Chloroplast** |  | * Plant cell * Animal cell |  |
| **Nucleus** |  | * Plant cell * Animal cell |  |
| **Golgi apparatus** |  | * Plant cell * Animal cell |  |
| **Vacuole** |  | * Plant cell * Animal cell |  |

**Cells and Me rubric**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria** | **Expert (10 pts.)** | **Intermediate (5 pts.)** | **Beginner (1 pt.)** |  |
| **Completeness** | Required organelles are represented, function, and have images. | Required organelles are represented, but two or more are missing either a function or an image. | Fewer than the required organelles are represented. | \_\_\_\_\_\_ × 3 |
| **Technology** | Scratch, Makey Makey, or alternative technology was used to the fullest extent to make an interactive model. | Scratch, Makey Makey, or alternative technology was used to some extent to make an interactive model. | Scratch, Makey Makey, or alternative technology was used very little to make an interactive model. | \_\_\_\_\_ × 2 |
| **Content** | All information in the product is accurate and well represented to the given audience.  Cell respiration and its relationship to photosynthesis are included and well explained. | Some of the information was not portrayed accurately and not represented for the intended audience.  Cell respiration is included and explained. | Portions of the content were not well represented for the given audience.  No explanation of cellular respiration. | \_\_\_\_\_\_ × 3 |
| **Creativity** | Presentation of the information is from a new perspective. Product includes elements of personality. | Presentation of the information is from a new perspective. Product has some elements of personality. | Some presentation of the information from a new perspective. | \_\_\_\_\_\_× 1 |
| **Reliability** | Five-year warranty (well assembled and put together) | One-year warranty | Not well assembled | \_\_\_\_\_\_ × 1 |