The Cell Project

7th Grade Life Science

Massachusetts and NGSS Standards of learning

This project will cover the following standards for learning:

- **Next Generation Science Standrds**: Students will learn that organisms are composed of cells and that some organisms are unicellular and must therefore carry out all of the necessary processes for life within that single cell.

Massachusetts and NGSS Standards of learning

Massachusetts State Standards:

- Recognize that all organisms are composed of cells, and that many organisms are single-celled (unicellular), e.g., bacteria, yeast. In these single-celled organisms, one cell must carry out all of the basic functions of life.

- Compare and contrast plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, cytoplasm, chloroplasts, mitochondria, vacuoles).

- Recognize that within cells, many of the basic functions of organisms (e.g., extracting energy from food and getting rid of waste) are carried out. The way in which cells function is similar in all living organisms.

- Describe the hierarchical organization of multicellular organisms from cells to tissues to organs to systems to organisms.

The Cell Project

You will create a presentation using Prezi.

Frame1: Title page with student information
Frame 2: Prokaryotic versus eukaryotic cells
Frame 3: Levels of organization within cells
Frame 4: Surface area to volume ratio in cells
Frame 5: Plant versus animal cells
Frames 6-17: Cell parts and their functions
Frame 18: Work Cited area

The Cell Part List

You will create a frame for each of the following cell parts:

- **Cell membrane**
- **Cell Wall**
- **Nucleus (Nucleolus and Chromatin)**
- **Cytoplasm**
- **Chloroplasts**
- **Mitochondria**
- **Vacuoles**
- **Rough Endoplasmic Reticulum (ER)**
- **Smooth Endoplasmic Reticulum (ER)**
- **Lysosomes**
- **Ribosomes**
- **Golgi Apparatus (Body)**

Frame Requirements for Cell Parts:

1. Place your frame within the cell part (by zooming!)

2. Name the cell part.

*3. Of the 12 **cell part** frames:

- 6 must include a **textbox** describing the part's function in detail and an image of the cell part.

- The other 6 frames must include a **visual/media presentation** that demonstrates the cell function.

*For detailed information on , please see next frame

Frame Requirements for Cell Parts

A More Detailed Look …

6 frames that have a text box that explains the structure and function(s) of each cell part in your own words, and whether the part is found in plant cells, animal cells, or both plant and animal cell.

OR…

6 frames that have a visual/media presentation of the function of the cell part. This may be done individually or in a small group. If you choose to work in a small group, ALL members must have an ACTIVE role in the presentation. All group members must include this presentation (with a live link or imported file). Ideas include skits, a"tutorial", songs, raps, etc. Be creative!

Academic Integrity

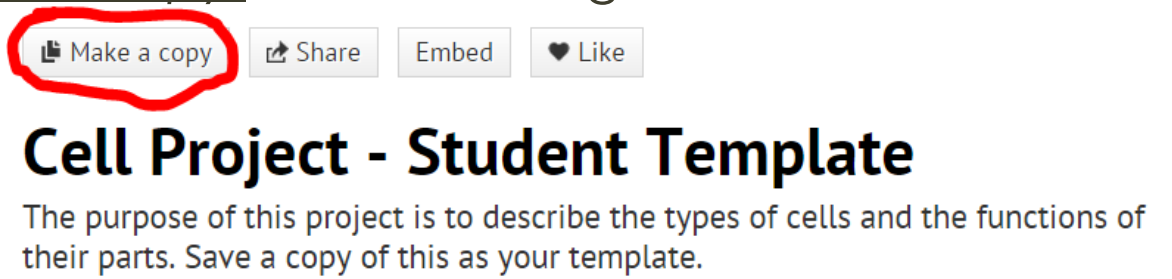
- Each student will create their own project, using **their own words**. Any referenced sources **must be cited**. Plagiarism of any sort will result in an automatic zero and notification of parents and school administration (see *Academic Honesty and Responsibility* in the student handbook).

- Group projects must include all members. Students will be assessed individually for his/her part of the project.

Directions:

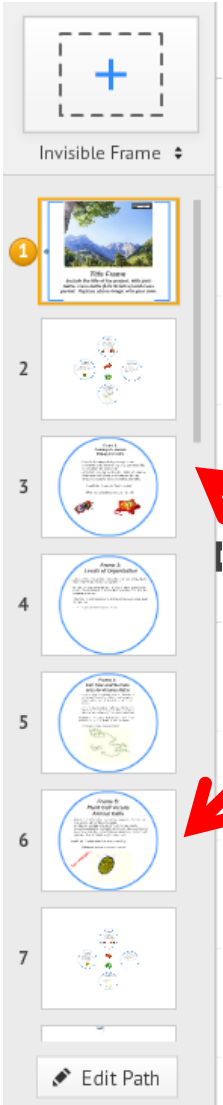
- **Create a Prezi student account –** Go to the Cells Unit page on the class website, then use the link titled ***Prezi – Student Sign-up.*** Using your school Gmail create an account and stay logged in.

- Next go back to the Cells Unit page and use the link titled ***Cell Project Student Template***. Once the link opens, the Prezi template will have an option to *Make a Copy.* See the image below…

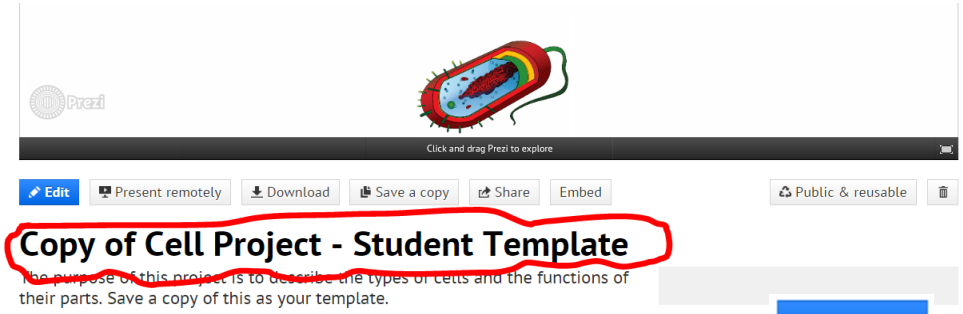


  - Once a copy is made, Prezi will bring you to your new account where you will find the copy of the Cell Project Student Template. Click on the picture of the template to get started.

Directions:



- **Change the title of your project** to *"Cell Project by (your name)"* by clicking on the title underneath the Prezi to edit it. See below…



- **Now to get started … click the**  **utton.**

- **"Edit Path" side bar** - Go to the side bar on the left hand side of the screen to edit each frame
- **Create Title Frame:** The first frame should have the title of the project, with your name, class name (Life Science) and class period.
- Follow prompts for each slide.
- Once slide is complete, remove (delete) prompt slide.

Frame 2: Prokaryotic versus Eukaryotic Cells

- Include picture of an example of prokaryotic and eukaryotic cells.
- In your textbox, compare the 2 types of cells. Name all features that these cells share, and features that are exclusive to prokaryotic and eukaryotic cells. **You must use complete sentences.**
- Useful tip: Use your Venn diagram.

When you are done, remove this slide.

Frame 3: Levels of Organization

- Create or import of a picture representing each level of organization beginning with cell and ending at organism.
- In your textbox, explain how the term "division or labor" applies to the levels of organization within multi-cellular organisms. **You must use complete sentences.**
- Useful tip: Investigate using the internet .

When you are done, remove this slide.

Frame 4: Cell Size and Surface area-to-Volume Ratio

- Create a single (one picture) cartoon or illustration of an "unhealthy" cell that is too big. Draw it using the tools in Explain Everything or import a hand drawn picture.
- What would happen to a cell if it got too big? Explain why it is disadvantageous for a cell to have too much volume and not enough surface area.
- Helpful hint: Watch the following clip to help you with your answer: Cell Surface Area to Volume

Frame 5: Plant versus Animal Cells

- Import your colored plant and animal diagrams. Reduce them in size to fit them on the same page.
- Enlarge one cell type and at a time and create a voice recording comparing plant and animal cells. Use your laser or saber to point to the cell parts that are found only in plant cells and those that are found only in animal cells.

Helpful hint: Create notes first before recording.

Frames 6-17

For each of the following cell parts, include a picture/diagram and a textbox or presentation detailing the function(s) of each cell part. All sources must be cited.

- **Cell membrane**
- **Cell Wall**
- **Nucleus (Nucleolus and Chromatin)**
- **Cytoplasm**
- **Chloroplasts**
- **Mitochondria**
- **Vacuoles**
- **Rough Endoplasmic Reticulum (ER)**
- **Smooth Endoplasmic Reticulum (ER)**
- **Lysosomes**
- **Ribosomes**
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Project grading/checklist:

See project handout for detailed list.

Slide/Cell Part	**Image** The image provided clearly shows the structure of the cell part or the information requested. The source of the image must provided below the image.(½ point) 1 point	**Description** Information requested must be clearly explained. For the cell parts, the function must be clearly described with detail.(3 points) For 6 cell parts the information may be written. The remaining 6 must describe the function with a visual/media presentation. All information must be correctly cited.(1 point) 4 points