



# Cell Analogy Activity

## Lesson Topic

Cell Analogy Activity

## RIEL Biology Element

Funds of Knowledge

## Time Required

One class period

## Standards Addressed

- SC.6.L.14.4 Compare and contrast the structure and function of major organelles of plant and animal cells, including cell wall, cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria, and vacuoles.

## Science and Engineering Practice

- Developing/using models and obtaining, evaluating, and communicating information.

## Lesson Summary

Students are tasked with creating a poster that relates the parts of a cell to the parts of something of their interest (city, theme park, etc). Students may choose to illustrate either a plant cell or an animal cell, but they must indicate on their poster which cell they have selected. On the back of their poster, they must attach a key (either typed or written in black/blue ink) that explains why they chose a particular building or place for each cell part. In addition, they should be sure to label all of their structures and places on the front of their poster. The poster must be drawn on a full-sized piece of white poster board.

## Materials

- Lesson PowerPoint
- Analogy examples
- Student instruction sheet
- Rubric
- White or colored posters
- Markers and/or colored pencils
- Pencils
- Black sharpie markers

## Before the Activity

Print out a copy of the student instruction sheet and rubric for each student. Get posters and materials set up for students to pick up.

## Lesson Activities

### 1. Do Now.

Students: Read Do Now question and write down answer in notebook. Share answers when asked by the teacher with a partner or whole class.

Teacher: Allow students 5 minutes to read and answer the Do Now question. Walk around and read answers that are written. Prompt discussion between partners and/or the whole class.

### 2. Instructions/Examples.

Students: Listen to the teacher explain instructions and look at materials needed for the activity. Ask questions or concerns by raising your hand.

Teacher: Go through PowerPoint objectives and examples prompting students to think about a topic that they are interested in. Go over the student instruction sheet and show students materials as you explain the instructions, rubric and key.

### 3. Choosing a Topic.

Students: Choose a topic that relates to likes and interests. Confirm with the teacher if the topic is appropriate or compatible.

Teacher: Walk around and guide students to choose a topic that relates to their interests and likes and can relate to who they are as a person.

## Content Learning Objectives

- Students will be able to relate structure and function for the components of plant or animal cells by creating a model that has analogies for each cell organelle relating to their interests.

## Teacher Notes

- [Examples of cell analogy](#)

## Lesson Activities

### 4. Getting Started.

Students: Make the analogy key for their project using the key table given by the teacher. When the key is complete and checked by the teacher, get materials for the poster and start by drawing items then coloring and outlining items.

Teacher: Give out key table and assist students with filling in the key. Check keys for completion/thoroughness. Walk around and help students with poster questions and materials.

### 5. Finishing and Sharing.

Students: Finish up posters and put up around the classroom for other classmates to view. Volunteer to share and explain your poster to class.

Teacher: Assist students putting up posters around the room and direct students to view other posters. Choose students to explain posters to class.



Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Student Instructions

You are tasked with creating a poster that relates the parts of a cell to the parts of a \_\_\_\_\_. You may choose to illustrate either a plant cell or an animal cell, but you must indicate on your poster which cell you have selected. You can choose examples from: tv shows, movies, places, or anything else that you can justify.

On the back of your poster, you must attach a key (either typed or written) that explains why you chose a particular object for each cell part. In addition, be sure to label all your structures and places on the front of your poster.

**Include the following organelles:** cell membrane, nucleus, nucleolus, mitochondria, ribosomes, endoplasmic reticulum, Golgi bodies, cytoplasm, and vacuoles.

If you're illustrating a **plant cell**, you'll also need to include a cell wall and chloroplasts.

If you're illustrating an **animal cell**, you'll also need to include lysosomes and centrioles.

**Format for your key:** We know that the nucleus controls all the activities of the cell. For example, the City Hall may represent the nucleus. Your key must have the following format:

Topic Chosen: <u>New York City</u>	What part of a <u>city</u> has a similar function as the organelle?	What will this structure look like?	What do the organelle and its analogy have in common?
Nucleus	City Hall	This structure will look like an important building labeled City Hall in the center of the city.	I chose City Hall to represent the nucleus because the nucleus controls all the activities of the cell and City Hall is the center of government and controls all the activities in City.

**Your explanation must be written in complete sentences.**

You will be graded on the following:

- Quality of drawing. You don't have to be an artist, but your poster must be neat and colorful.
- Inclusion of all appropriate structures. Remember, if you've chosen to illustrate an animal cell, DON'T include plant structures.
- Quality of key. The key must be complete, and explanations must be reasonable.
- Adherence to all the instructions.
- Creativity



Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Student Idea Sheet: part 1

Use this table to help you organize your ideas. You do not need to restrict your research and analogy to the cell components listed below. They are merely a guideline.

This part of my analogy is like a *cell part* because...

Topic Chosen: _____	What part of a _____ has a similar function as the organelle?	What will this structure look like?	What do the organelle and its analogy have in common?
Nucleus			
Lysosome			
Mitochondria			
Smooth Endoplasmic Reticulum			
Vacuole (plant)			
Cell Wall (plant)			
Chloroplast (plant)			



Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Student Idea Sheet: part 2

Cell Membrane			
Golgi Apparatus			
Ribosome			
Rough Endoplasmic Reticulum			
Cytoplasm			
Cytoskeleton			



Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Cell Analogy Rubric: part 1

## WRITTEN EXPLANATIONS OF ANALOGIES

- Analogy reasoning/Content 4 points possible
- Thoroughness 4 points possible
- Written Presentation 4 points possible

## MODEL/POSTER/CARTOON

- Creativity and Presentation 10 points possible
- Thoroughness 10 points possible

## TOTAL POINTS

**32 points possible**

### Analogy reasoning (4):

4/4	3/4	2/4	1/4
Every cell part and its analogy have a relevant common structural and/or functional characteristic. Example: An airplane is like a car because they both move and produce CO <sub>2</sub>	Most cell parts and their analogies have a relevant common structural and/or functional characteristic.	Some cell parts and their analogies have a relevant common structural and/or functional characteristic. Some reasoning may be questionable or flawed. Example: A student is like a book because they both read.	The relationship between the cell part and analogy is illogical <b><u>or not explained</u></b> Examples: Mars is like a jellybean because it's red. Genes are like computer programs

### Thoroughness (4):

4/4	3/4	2/4	1/4
At least 10 cell components are included in the analogy	7-9 cell components are included in the analogy.	4-6 cell components are included in the analogy	Only 1-3 cell components are included in the analogy.



Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Cell Analogy Rubric: part 2

## Written Presentation (4):

4/4	3/4	2/4	1/4
Overall neat, clear presentation that is typed or written legibly and in full, correct sentences.	Generally neat, clear presentation, with only minor grammar problems or sloppiness and written in complete sentences	Presentation is adequate but has some grammar problems or is sloppy.	Presentation lacks neatness and/or has many incomplete or grammatically incorrect sentences.

## Model/Poster/Drawing/Cartoon Creativity and Presentation (10):

*Models or representations may take any appropriate form from a colored pencil sketch to a cartoon drawing to a 3D model. Creativity in construction is encouraged. The model, in whatever form it takes, must include the major cell parts.*

1-6	7-8	9	10
Stick figure drawings on notebook paper, etc.	2d Sketch, or digital representation. Col or.	A creative project that shows attention to detail.	Stands out for its presentation of the analogy in a clear, insightful, and creative way.

## Thoroughness (10):

1-5	6-7	8-9	10
Only 1-3 cell components are depicted and/or explained	4-6 cell components are included in the model	7-9 cell components are included in the model.	10 or more components are included in the model