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**Comparing Plant Cells**

Plant and animal cells have many of the same organelles that do similar jobs in each cell. Additionally, plant and animal cells are very different based on the organism from which it came and its job within that organism. In this lab, you will be looking at common examples of plant cells. You will be looking for similarities and

What are some similarities and differences you are already aware of?

* Similarities
* Differences

Make some predictions about what you expect to see when looking at plant and animal cells in this lab.

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**Lab Etiquette:**  **Infractions:**

1. You will only converse with your lab partners. \_\_\_ Reminder
2. You will only discuss topics concerning the lab activity. \_\_\_ Lunch Detention
3. You will treat your lab partners with respect. \_\_\_ Removal from
4. You will follow all lab directions. **Safety:**
5. You will participate equally.
6. Use equipment properly.



**Part I: Plant Cells**

You have already observed a common plant and animal cell to see how they are alike and different, but are all plant cells alike? How about all animal cells? During this investigation, you will compare plant cells from different parts of the plant. While you are making your observations ask yourself, “Is there a relationship between structure of a particular cell (meaning how it looks and the parts it has) and its function (the job it does for the plant)?”

**Materials:**

Images

Colored pencils

**Form Fits Function**

**Step 1 View** the **root tip** picture. You are viewing the bottom of a plant root at high power.

**Step 2 Draw** 6 or 7 adjoining cells to show how they fit together and the parts they contain (do not fill the entire circle below).

\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_X

**Step 3 Label** these parts (use p. C20 and C22 in your textbook to help you): **cell wall, cell membrane, cytoplasm, nucleus, nucleolus**, and **vacuole** (may not be seen).

**Step 4** What cell parts can you see and identify that you have seen before?

**Step 5 View** the **Elodea** image. You are viewing the leaf of an aquatic plant often used in aquariums. You are viewing the Elodea in high power.

**Step 6 Draw** 6 or 7 adjoining cells to show how they fit together and the parts they contain (do not fill the entire circle below).

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**Step 6 Label** these parts (use p. C20 and C22 in your textbook to help you): **cell wall, cell membrane, cytoplasm, vacuole** (may not be seen), and **chloroplasts**.

**Step 7** (a) What cell parts can you see and identify that you have seen before (in the onion skin or root tip)?

1. Do you see any new structures that you haven’t seen before? If so, what are they and what do they do for the plant (see p. C23 in text)?
2. Every plant cell has a nucleus, even the *Elodea* cells above, why can’t you see it?

**How Organisms Are Organized**

**Step 1** View the **lilac leaf** image. This slide was made by slicing a leaf from edge to edge. The slices, called cross-sections, are extremely thin and stained with special dye, so you can better see their parts. You are viewing the leaf at medium power.

1. How many different kinds of cell shapes do you see? Describe them and draw an example of each.
2. Describe how each of the different kind of cells are arranged (i.e., bricklike, tightly packed). Make an inference as to why they are arranged the way they are.

**Step 2 Read** p. C29-31 in your textbook and briefly summarize what it says in your own words about the **hierarchy** of the organization of a multi-cellular organism. Pay close attention to the picture on p. C30.

**Step 3 After** reading this passage and examining the cross-section of the leaf, indicate whether it is a tissue or an organ? How do you know?

**Summary**

1. Why are chloroplasts found in *Elodea* cells and not in the cells of a *root tip*?
2. Multi-celled organisms are highly organized. Fill in the boxes below to demonstrate the levels of organization (**hierarchy**) in a multi-cellular organism from simple (smallest) to complex (biggest).

cells

1. Would you expect to find the same kind of **tissues** in a root as in a leaf? Explain your reasoning.

**Application**

1. Put a check (✓) by each item that you would expect to find chloroplasts:
* oak leaf
* grass roots
* potato
* rose flower petal
* skin on your arm
* skin of a cucumber
* lime Jell-O
* parsley
1. Part 1 of this lab was titled, “Form Fits Function.” Based on your investigation of these cells and their parts, how exactly does “form” (shape and parts) fit “function” (job or role)? Use two specific examples from this lab as evidence.
2. Circle true or false below. If the statement is false, explain why it is false.
	1. All plant cells have a nucleus. true/false
	2. All plant cells have one large vacuole. true/false
	3. Chloroplasts are found in every plant cell. true/false
	4. All plant cell parts can be seen without a stain. true/false
	5. All plant cells do the same job. true/false
	6. All plant cells have a rigid cell wall. true/false
3. Every living thing carries out important life processes which help an organism/cell stay alive. You will learn more about these life processes later, but read the scenario below and identify which organelle is responsible for helping to carry out the life process described.
	1. Transporting materials from place to the other—
	2. Storing waste until it can be excreted—
	3. Reproduction…splitting into two new cells—
	4. Respiration…breaking down glucose to release energy—
	5. Photosynthesis--