

Name \_\_\_\_\_ Period \_\_\_\_\_

## Comparing Plant and Animal Cells

**Problem-** How do plant and animal cells compare in structure?

**Hypothesis-** Propose a hypothesis about how the differences in structure of plant and animal cells are related to differences in function.

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**Materials-** microscope, Elodea leaves, forceps, medicine dropper, water, slides, coverslips, toothpicks, methylene blue, iodine, onion

### Experiment-

1. Make a 3- column chart on the backside of this paper. This will be your data table.  
Label the columns-  
Leaf Cells (Elodea)      Cheek Cells (Animal)      Onion Cells.
2. Make a wet-mount slide of an Elodea leaf. Observe the leaf with the microscope on low power. Under the Leaf Cell column, draw several cells and label the cell membrane, cell wall, cytoplasm, nucleus, and the chloroplasts. Wash your slide.
3. Take a toothpick and gently wipe the inside of your cheek. The toothpick will pick up dead cells that are always there. Wipe the toothpick on a clean slide. Add one small drop of methylene blue. This will stain the cells. Observe the cells under low power on your microscope and then on high power. Under the Cheek Cell column, draw one cell and label the cell membrane, cytoplasm, and the nucleus. Wash your slide.
4. Take a section of onion and bend it backward to break a layer. Between each layer is a thin membrane that is one cell thick. A small piece of this membrane is what you want to mount on your slide. Add a drop of iodine to stain the cells. Observe the cells under low and high power on your microscope. Under the Onion Cells column, draw several cells and label the cell membrane, cell wall, cytoplasm, and the nucleus.

### Analysis and Conclusion-

1. Which organelles are unique to plant cells?
2. Which organelles are unique to animal cells?
3. What makes the leaf green?
4. The onion does not contain the green structures, even though it is a plant. Why are the green structures not needed?
5. Why don't animal cells have cell walls?

## Cheek Cell Lab

The purpose of this lab is to review basic cell biology and to identify specific cells through staining techniques.

### Objectives:

1. Understand the use of the microscope and its functions.
2. List the materials used in preparation of wet mount slides.
3. Prepare a slide and identify the cell through correct use of the microscope.
4. Draw and label the parts of the cheek cell.
5. Practice safe laboratory techniques while preparing slides.

### Introduction:

Today we will examine your own cells. That's right, your living cells. You are going to remove some cheek cells from the inside of your mouth. You will want to make sure you do not have food particles in the saliva when doing this. Rinse your mouth with water if you need to. You will then prepare a slide and observe the cell and its parts, then label each organelle.

### Procedure:

1. Gather all your materials and prepare your microscope.

You will need:

Slide	Slide cover	Methylene Blue stain, 1% Solution	Microscope
Swab	Forceps	Pencil and paper	

2. Gently scrape the inside of your mouth with a swab several times with adequate pressure. This scraping will collect some of the cheek cells.
3. Place the cells on a clean slide (in center).
  - i. Apply one drop of stain over the cells.
  - ii. Place the slide cover over one end of the drop and gently drop the slide cover so that it lands on top of the sample.
  - iii. Use the paper towel on one side of the cover to draw the excess stain from underneath the cover mount. This is called "wicking."
  - iv. Place the slide on the stage of the microscope. Adjust the microscope so you begin on the lowest power of magnification. Focus the slide.
  - v. Now move to the next magnification and focus.
  - vi. When you have a good image of a cheek cell, ask your teacher to inspect the picture to make sure that you in fact are looking at a cheek cell. If you need help, ask!
  - vii. Use the lab worksheet to draw the cell and label its parts.
4. Turn in your work and clean up your station.

***Cheek Cell Lab***

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

Cell Type:

Drawings:

Low magnification:

High Magnification / cell parts:

Teacher Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## **Cheek Cell Lab**

**Objective:** Observe cheek cells under a microscope.

**Level:** 9-12

**Subjects:** Life science, Biology

**Prep Time:** 10-20 minutes

**Duration:** 30-40 minutes

### **Materials**

Tooth picks or cotton swabs  
Microscope  
Glass slides and covers  
Iodine or Methylene Blue  
Eye droppers  
Paper towels  
Forceps  
Student worksheets

**Extensions:** Can use onion or blood cells as well.

### **Pre-lesson instructions:**

Have students work in groups of at least two for this lesson. Each group will need a microscope and materials to create a slide of cheek cells.

Set up microscopes in a laboratory setting.

Create a mixture of Methylene Blue in droppers ahead of time and label. (Warn students about the effects of stain.) Note that this lesson is an extension of the previous lessons on the cell and its parts.

Model the entire procedure after all the students have their worksheets and are in groups. Ask if there are any questions.

I sometimes find it necessary to stop the lab and discuss a teachable moment or a problem with the process if all the groups are having difficulty.

### **Discussion / Wrap up:**

Have the students share their diagrams with the class.

Discuss the diagrams as a class. Were the students surprised by what they saw?

Why was the stain important?

What difference did the power setting make in seeing their cells?