CELLS – THE BASIC UNIT OF LIFE

Directions:

1. Fill in the chart using your notes (15 points)
2. Read the procedure
3. Create a purpose and record on line provided (3 points)
4. Form a hypothesis. Record in the space provided. (10 points)

**Background Information**

-place a check mark in the box if the cell contains the part listed

| **Cell Organelle/Part** | **Prokaryotic Cell** | **Plant Cell** | **Animal Cell** |
| --- | --- | --- | --- |
| **Cell Wall** |  |  |  |
| **Cell Membrane** |  |  |  |
| **Cytoplasm** |  |  |  |
| **DNA** |  |  |  |
| **Nucleus** |  |  |  |
| **Ribosome** |  |  |  |
| **Mitochondria** |  |  |  |
| **Chloroplast** |  |  |  |
| **Endoplasmic reticulum** |  |  |  |

# Question

What are the differences and similarities between plant, animal and prokaryotic cells?

# Purpose

The purpose of this lab is to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Hypothesis**

Predict what you will observe about each cell. What will you see through the microscope?

Think about color, shape of cell, size of cell, and major differences. Remember you will not see significantly small parts like ER, Golgi, and mitochondria.

Use the following sentence starters to help you:

We will identify plant cells by the \_\_\_\_\_\_\_\_\_\_ shape and presence of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. These

cells will be \_\_\_\_\_\_\_\_\_\_ in size.

| **Plant** |  |
| --- | --- |
| **Animal** |  |
| **Prokaryotic Cell** |  |

## IV. Materials

Microscope slides cover slips forceps

Razor blade iodine stain onion scalpel

Human cheek cells medicine dropper toothpick

Methylene blue Elodea leaves

**Results: Data and Observations (each specimen grade out of 16 points)**

| **1. Yogurt Bacteria**  **Power of Microscope: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **How many cells? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** Describe the following: Shape of cells:  Arrangement of cells: | **2. Onion**  **Power of Microscope: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **How many cells? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** Describe the following: Shape of cells:  Arrangement of cells: |
| --- | --- |
| **Draw and color what you see in the microscope. Make sure your drawing fills the space.**  **Choose one cell in your drawing and label the cell membrane and cytoplasm.** | **Draw and color what you see in the microscope. Make sure your drawing fills the space.**  **Choose one cell in your drawing and label the nucleus and cytoplasm of one cell.** |

| **3. Elodea Leaf**  **Power of Microscope: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **How many cells? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  Describe the following:  Shape of the cells:  Arrangement of the cells: | **4. Human Cheek (epithelial) cells**  **Power of Microscope: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **How many cells? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  Describe the following:  Shape of the cells:  Arrangement of the cells: |
| --- | --- |
| **Draw and color what you see in the microscope. Make sure your drawing fills the space.**  **Choose one cell in your drawing and label the cell wall, chloroplasts and cytoplasm of one cell.** | **Draw and color what you see in the microscope. Make sure your drawing fills the space.**  **Choose one cell in your drawing and label the cell membrane, nucleus and cytoplasm of one cell.** |

## Procedure

Overall:

1. For each specimen, you must draw and color what you see in the microscope.
2. Label the parts required in the procedure for the individual cells.
3. Record the magnification of your drawing.
4. Carefully set up your microscope, making sure the electrical cord cannot be tripped over and that the cord in NOT near the light.
5. Always start on LOW power! Do not use high power if it will hit your slide

## Specimen 1: Yogurt Bacteria

1. Obtain a slide from the “buffet”
2. Use a cotton swab (Q-tip) to obtain a SMALL sample of yogurt.
3. Put the yogurt blob in the center of your slide.
4. Add ONE drop of water to the yogurt blob and stir with the swab.
5. You will make a smudge on the slide.
6. Carefully place a cover slip over your smudge.
7. Use the microscope to observe the smudge. Start with low power, then switch as long as you don’t crack the slide
8. Show Mrs. Gallivan your slide BEFORE drawing.
9. Draw what you see. Label the cell membrane and cytoplasm. Estimate how many bacterial cells you see.

**Specimen 2: Onion**

1. Cut an onion lengthwise if it has not been done for you.
2. Peel the delicate transparent tissue from the inner surface.
3. Cut a square of the tissue and place it on a slide
4. Add a drop of water. Try not to wrinkle the tissue.
5. Add ONE drop of iodine to the tissue sample.
6. Add a cover glass to your wet mount. Examine the living cells under low power, then high power if possible.
7. Draw, color and label what you see
8. Record the following information in your data:
   * + 1. Shape of cell:
       2. Color:
       3. Nucleus: (ask Ms. Gallivan)

**Specimen 3: Elodea Leaf**

1. Pick ONE leaf off of the plant.
2. Place the leaf in the center of your slide.
3. Add a drop of water to the leaf, then put the cover slip on.
4. Examine the leaf under low power. Select a portion of the leaf where the cells are clear and in one layer- ask if unsure.
5. Bring the leaf into focus under the highest power possible.
6. Look for small, oval green bodies that appear in the cells. These are the chloroplasts.
7. Draw, color and label what you see
8. Label the cell wall, chloroplasts, cytoplasm, and nucleus (ask Ms. Gallivan)

## Specimen 4: Human Epithelial Cells

1. Gently scrape the inside of your cheek with a clean wooden stick.
2. Wipe the wet end of the stick on the center of your slide. You will just see a wet smudge form.
3. Add a drop of methylene blue and a cover slip to the slide.
4. Examine the cells under low power of the microscope.
5. Switch to high power and look for the outer edge of the cytoplasm.
6. Draw, color and label what you see
7. Label the cell membrane, cytoplasm and nucleus of your cell.

| **Pts.** | **Size** | Execution | **Labeling** | **Neatness** |
| --- | --- | --- | --- | --- |
| **4** | **Complete and correct:**  - Drawing fills space provided | **Complete, thought out and written well:**  - Every line should be clear and sharp,  - Every line should indicate part of the specimen.  - Only pencil and colored pencil is used (no markers) | **Complete and correct:**  **-** Lettering should be parallel to the top and bottom edges of the paper.  - All labels should be printed.  - Lines to parts in the drawings should not cross, and should be straight.  -power of scope listed  - Estimated number of cells listed  -Arrangement of Cells listed | **Complete and correct:**  - No smudges or smears present.  - Labels are neatly printed.  - Drawing shows attention to detail.  - Drawing is an accurate representation of the specimen. |
| **3** | **Complete but some items incorrect:**  - Drawing is smaller than ½ of the area | **Complete and not too well thought-out:**  -Missing an element from above | **Complete but some items incorrect:**  - Any one of the five above items is not done properly. | **Complete but some items incorrect:**  - One or two smudges or smears present.  - Some labels not neatly printed.  - Some lack of attention to detail.  - Drawing is mostly accurate. |
| **2** | **Partially complete and partially correct:**  - Drawing is much smaller than ¼ of the area | **Partially complete and partially correct:**    - Any two of the above items is not done properly. | **Partially complete and partially correct:**    - Any two of the five above items is not done properly. | **Partially complete and partially correct:**  - More than three smudges.  - More than three labels not neatly printed.  - Definite lack of attention to detail.  - Drawing is lacking accuracy. |
| **1** | **Incomplete and mostly incorrect:**  - Drawing is much too small for the area | **Incomplete and mostly incorrect:**  - Any three of the above items is not done properly. | **Incomplete and mostly incorrect:**  - Any three of the three above items is not done properly. | **Incomplete and mostly incorrect:**  - Many smudges.  - Many labels not printed neatly.  - No attention to detail.  - Drawing is clearly not accurate. |
| **0** | **All items missing.** | **All items missing.** | **All items missing.** | **All items missing.** |