# Make Up Lab 2: Cell Structure: How Should the Unknown Organism be Classified?

Introduction

Plant and animal cells have many organelles in common, including the nucleus, nucleolus, nuclear envelope, rough and smooth endoplasmic reticulum, Golgi apparatus, ribosomes, cell membrane, and mitochondria. Some organelles found in plant cells, however, are not found in animal cells and vice versa. For example, animal cells have centrioles (which help organize cell division in animal cells), but plant cells do not. These differences can be used to distinguish between cells that come from a plant and cells that come from an animal. The figure to the left shows animal cells from the inside of a human cheek. The figure to the right shows plant cells from an onion.
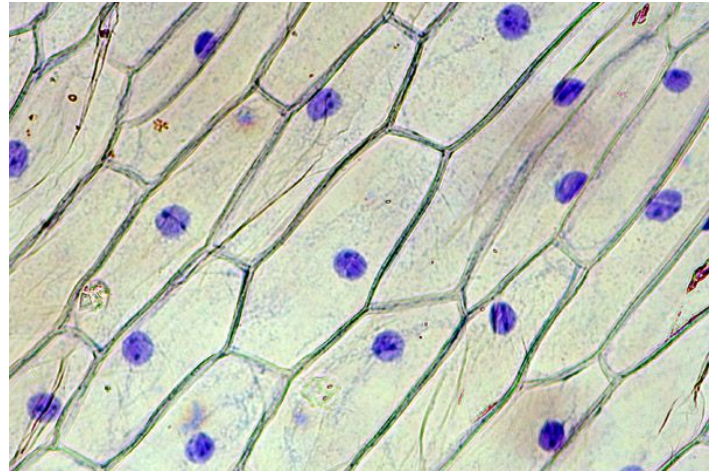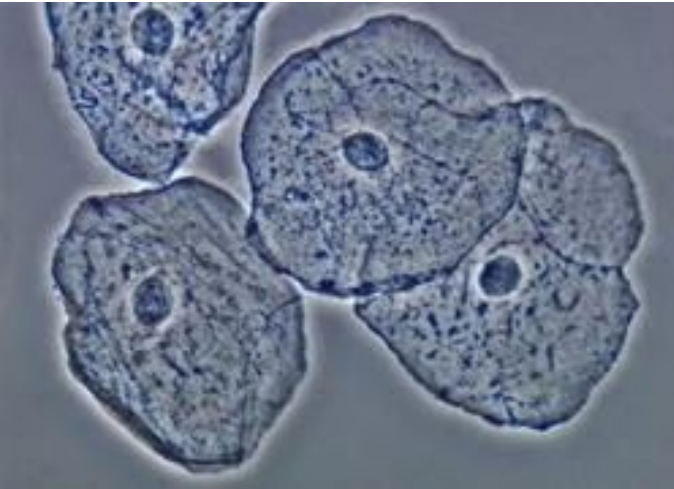
Your Task

Document the traits of an unknown microscopic organism. Then classify it based on what you know about the characteristics of plant and animal cells.

The guiding question of this investigation is: **How should the unknown organism be classified?**

Materials

You may use any of the following materials during your investigation (all slide pictures are located on the last page):

- Known slide A (plant cells)
- Known slide B (plant cells)
- Known slide C (animal cells)
- Known slide D (animal cells)
- Slide with an unknown organism

Getting Started
To answer the guiding question, you will need to conduct a systematic observation of the cell samples provided. To accomplish this task, you must first determine what type of data you will need to collect, how you will collect it, and how you will analyze it.

To determine *what type of data you need to collect*, think about the following questions:
- What type of measurements or observations will you need to make during your investigation?
- How will you quantify any differences or similarities you observe in the different cells?

To determine *how you will collect your data*, think about the following questions:
- How will you make sure that your data are of high quality (i.e., how will you reduce error)?
- How will you keep track of the data you collect and how will you organize the data?

To determine *how you will analyze your data*, think about the following questions:
- How will you define the different categories of cells (e.g., what makes a plant cell a plant cell, what makes an animal cell an animal cell)?
- What type of calculations will you need to make?
- What type of graph could you create to help make sense of your data?

Report
Once you have completed your research, you will need to prepare an investigation report that consists of four sections (be sure to have section headings):

1. Introduction: Give some background information on the topic. Explain what question were you trying to answer and include a hypothesis. (Background info, research question and hypothesis)
2. Procedure: What did you do during your investigation and why did you conduct your investigation in this way? (How you collected and analyzed data)
3. Data: Include a data table and/or graph to show your results. Be sure to include a title for your table or graph with labels for the variables.
4. Conclusion: What is your argument? (Claim - Evidence - Reasoning)

Your report should answer these questions in two pages or less. The report must be typed, and any diagrams, figures, or tables should be embedded into the document. Type your report on Google Docs (12 point font, double-spaced) and share it with your teacher. Your report will be graded based on the rubric in the class syllabus.
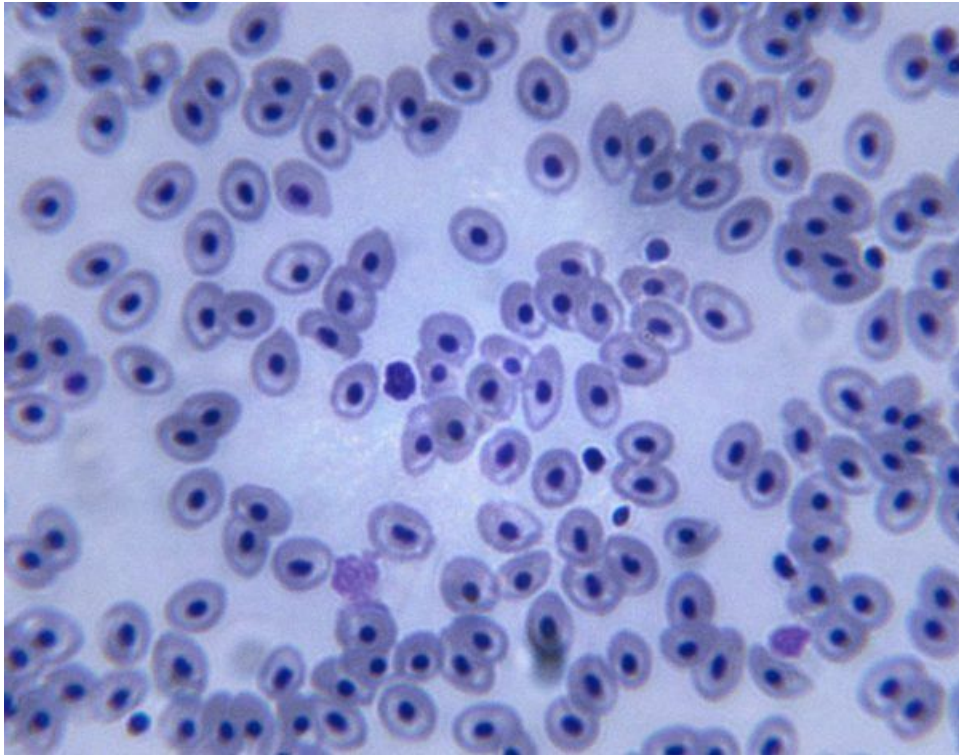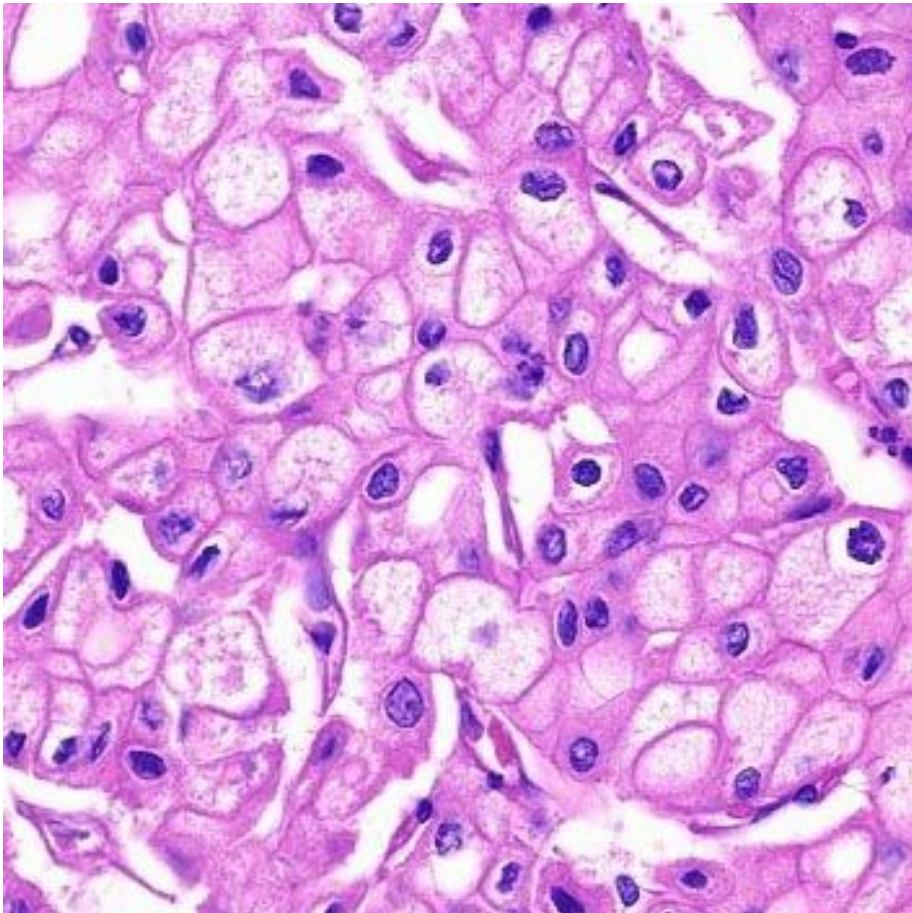
Known slide A (plant cells)
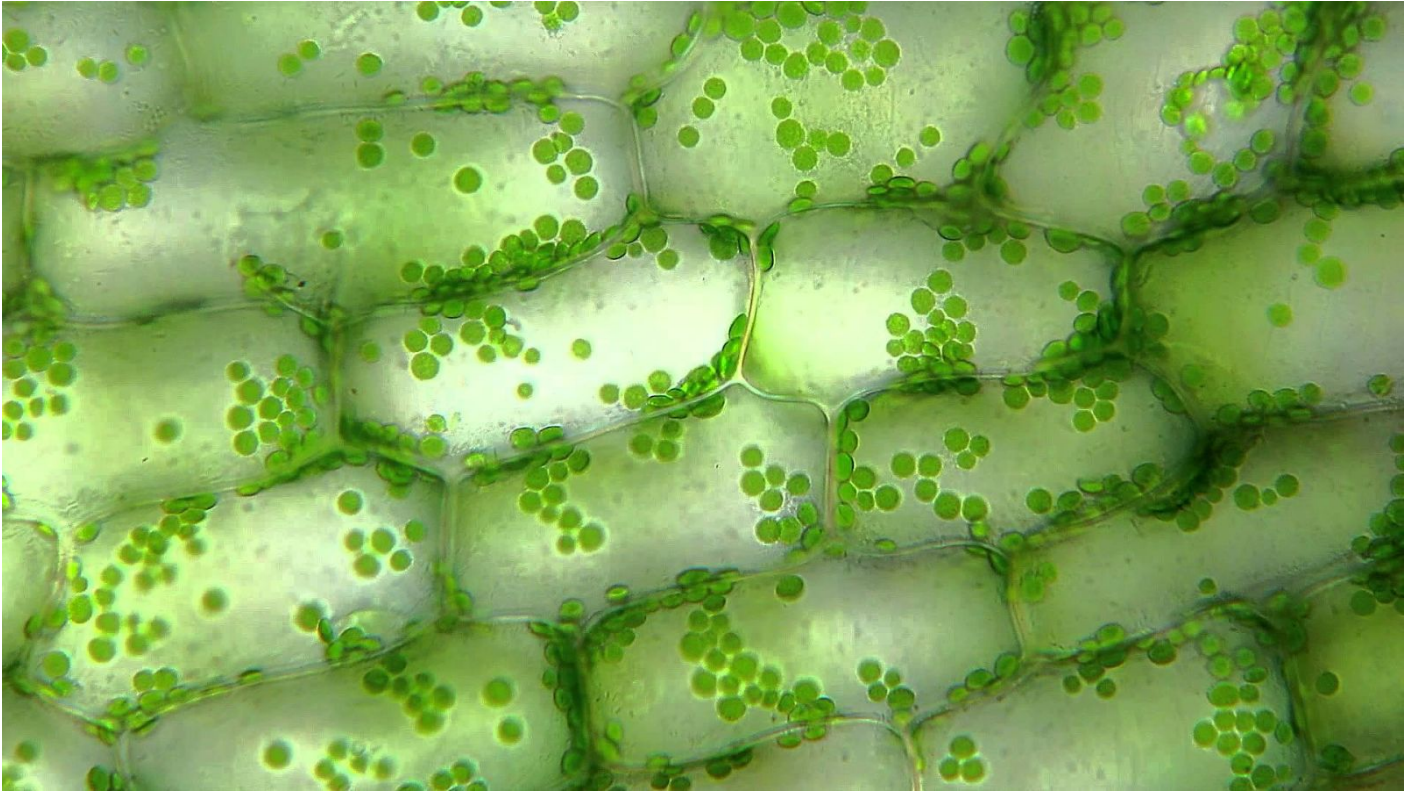
Known slide B (plant cells)
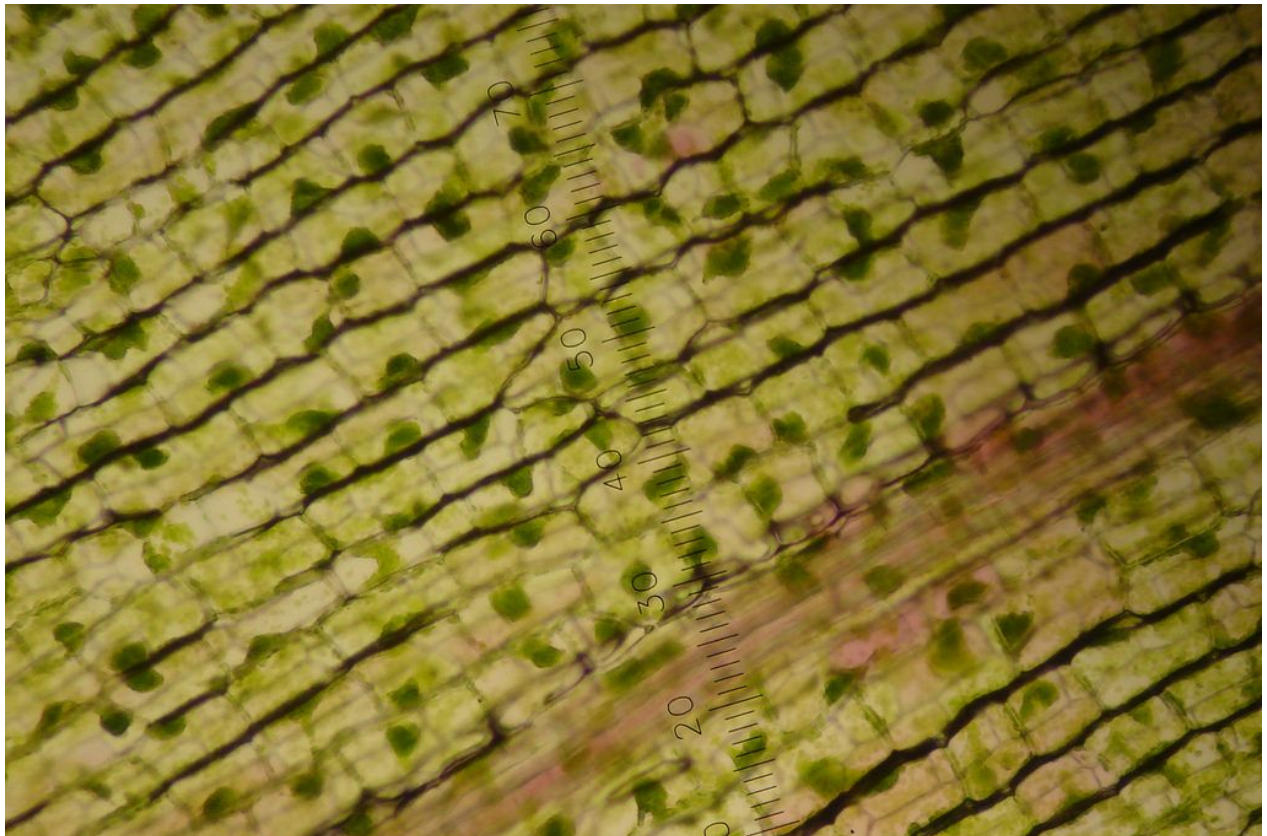
Known slide C (animal cells)

Known slide D (animal cells)

Slide X with an unknown organism