

MAGNIFICENT MAGNIFICATION



STUDENT WORKBOOK



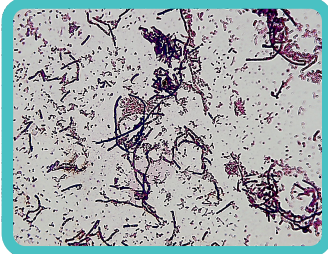
LOOK CLOSER!

In this activity, you will observe some mysterious photos to discover an unseen world.

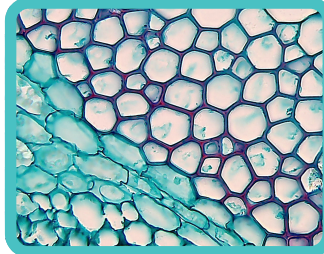
I

THINK SMALL

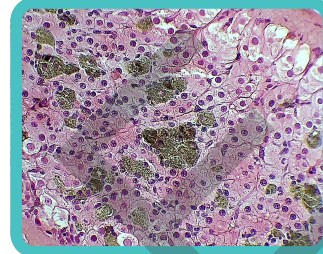
a.



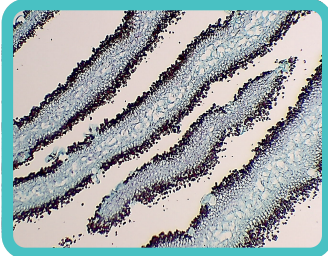
b.



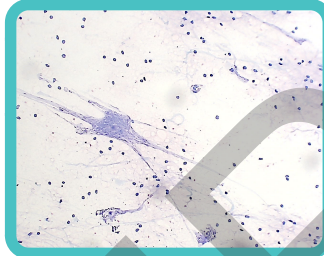
c.



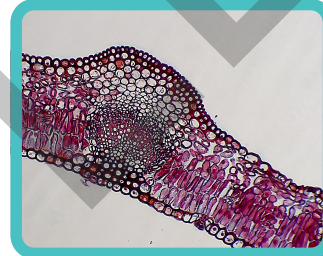
d.



e.



f.



THINK ABOUT IT!

1. What do you think you were looking at in the photos? Do you think it was something living or non-living? If it was living, is it a plant, animal, or neither?

a.

b.

c.

d.

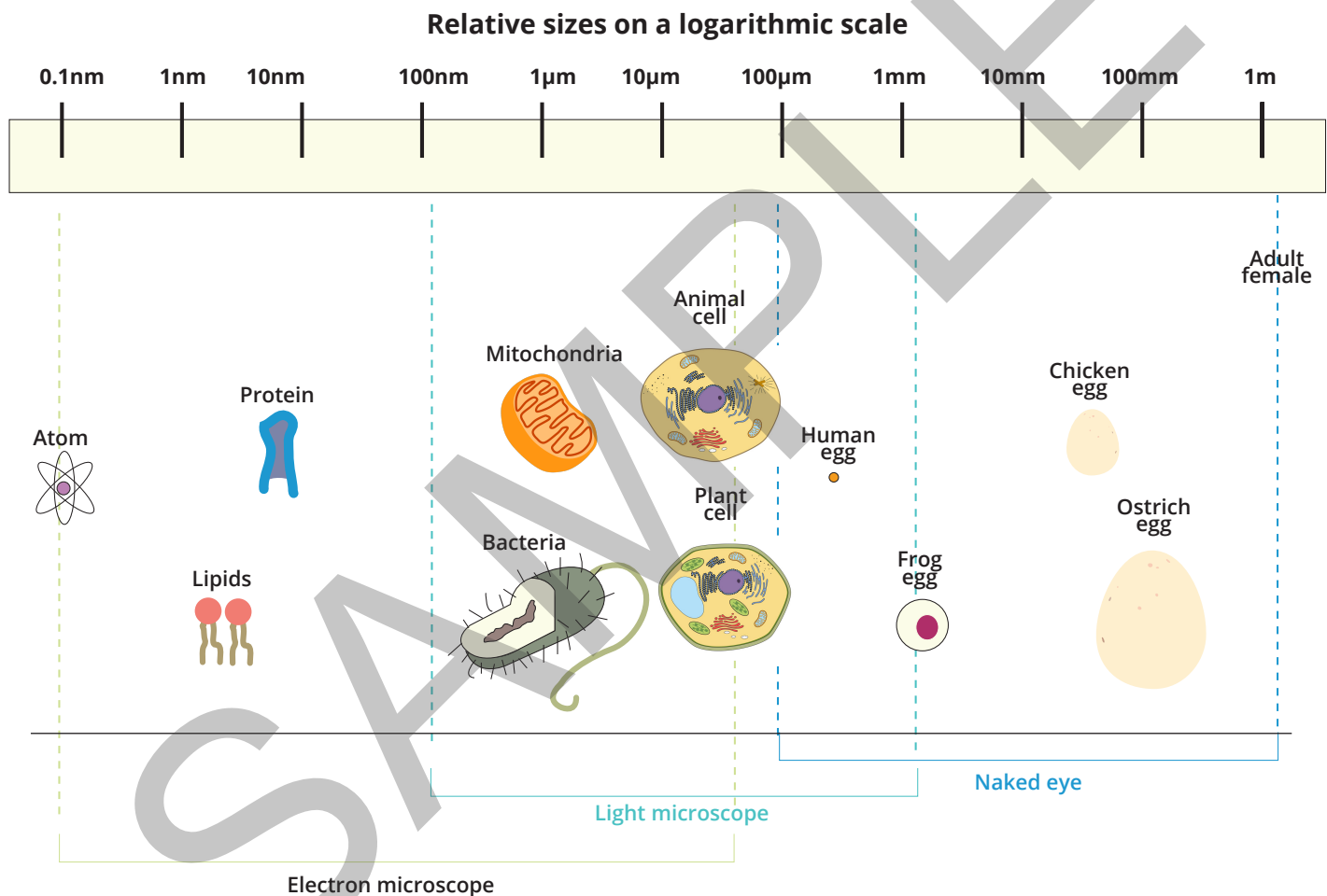
e.

f.

2. What are two questions you have about the photos?

The pictures in the chart were **cells**. Cells are the basic building blocks of life. Robert Hooke coined the term in 1665 while looking at a piece of cork under a compound microscope.

As you can see in the diagram, each cell is up to 100 micrometers (μm). There are 1,000,000 μm in a meter, and 3 meters is as tall as an adult female. So, you would have to line up 3,000,000 cells in a row to be as tall as an adult woman.



Within a cell, there are many parts or **organelles**. Each organelle has a specific job that allows the cell to function. One organelle is the mitochondria, which is approximately 1 μm . This means you would have to line up 100 mitochondria to be as long as a cell. Or, you would have to line up 100,000,000 mitochondria to be as tall as an adult female.

LIFE OF BOXES

Plants cells are just one type of cell, but plants make up over 80 % of the mass of living things on Earth.

In this activity, you will create your own slides to compare some of that 80 %.

LEARNING GOALS:

- ✓ I can do an investigation to show that living things are made of cells.
- ✓ I can use models to show how cells and cell parts function.
- ✓ I can use microscopes to investigate the cell-level structures of several types of organisms.

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COMPARING THE 80%

There are three organelles found within plant cells that are not found within animal cells: amyloplast, cell wall, and chloroplasts. Finding these organelles in a cell can identify it as a plant or animal cell.

Amyloplast

An amyloplast is a **plastid** (a small organelle that contains pigment or food) that produces and stores starch. These are found in vegetative plants, like tubers and bulbs. Examples of tubers you might be familiar with are potatoes, ginger, and garlic. Animal cells do not store or produce starch, so this organelle would not be useful in an animal cell.

It is also thought that amyloplasts help plants sense gravity. This helps the roots grow in the correct direction: down.

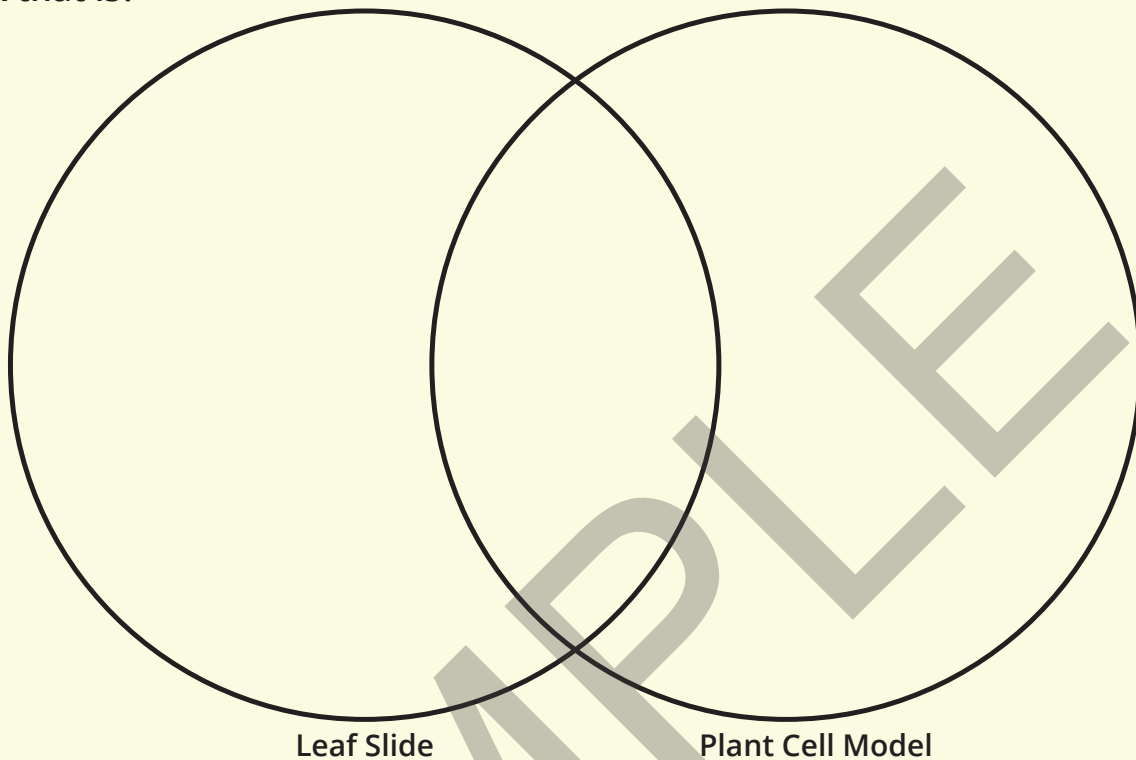
Cell Wall

The cell wall helps to support, protect, and strengthen the cell. Plant cells take in a lot of water, which vacuoles store. If there was no cell wall to support the organelles within the plant cell's cytoplasm, the cell could burst. The cell wall also helps to support tissues like stems so plants can hold themselves up and do not wilt easily.

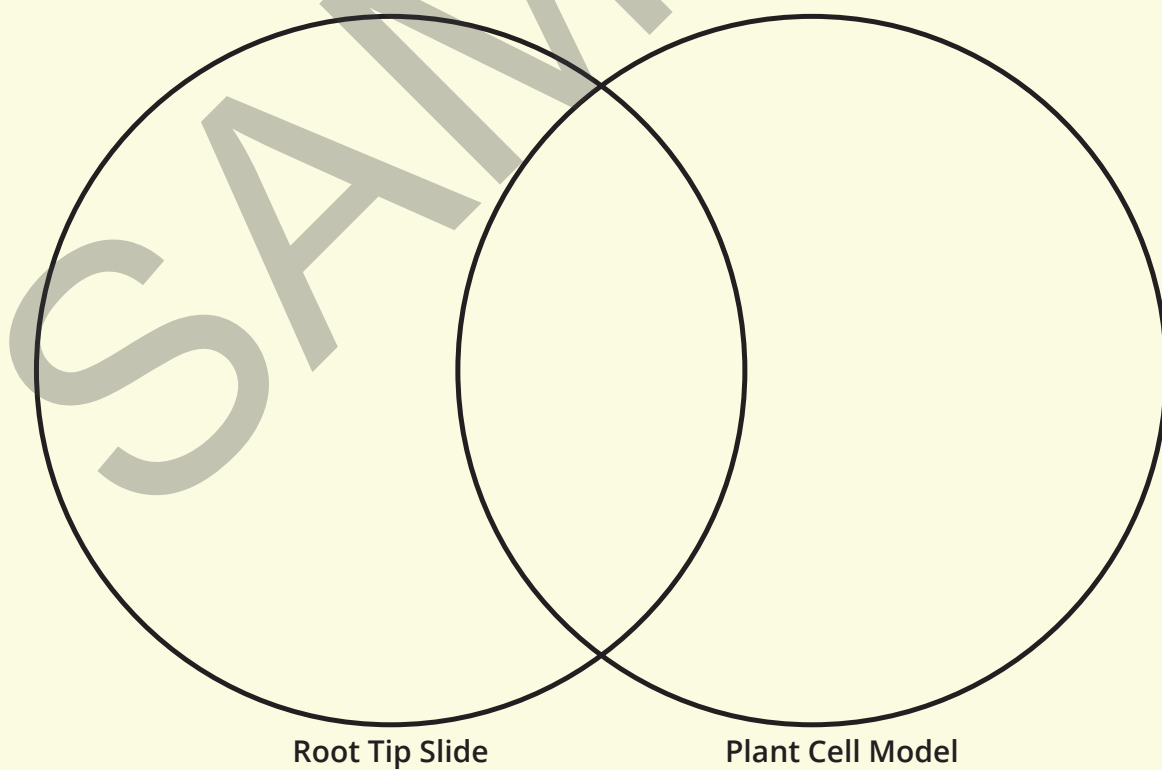


4. Models help us to better understand what we have learned about, as well as what we can be looking for in future learning. Compare each of the slides to the plant cell model you made in Activity 1. If there are differences, why do you think that is?

a.



b.



Make sure to keep all the materials from this experiment for future experiments. You can choose to keep your leaf slide or clean it off with soap and water.



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Kit	SU-MAGMAG
Instructions	IN-MAGMAGS
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