

Name: _____

Date: _____

Student Exploration: Cell Types

Vocabulary: ATP, bacteria, carbon dioxide (CO₂), cell, cellular respiration, compound light microscope, eukaryote, multicellular, muscle cell, neuron, organelle, photosynthesis, prokaryote, protist, red blood cell, root hair cell, tissue, unicellular, white blood cell

Prior Knowledge Questions (Do these BEFORE using the Gizmo.)

1. How do you know if something is alive? Describe some of the characteristics of living things.

Beings that are alive have the ability to reproduce, evolve and maintain a metabolism (be able to produce energy from gaining energy)

2. Humans, plants and mushrooms are all alive. What do these organisms have in common?

They can all reproduce/multiply, evolve and have some sort of metabolism

Gizmo Warm-up

In the *Cell Types* Gizmo, you will use a light microscope to compare and contrast different samples. On the LANDSCAPE tab, click on the *Eloaea* leaf. (Turn on **Show all samples** if you can't find it.) Switch to the MICROSCOPE tab to observe the sample as it would appear under the microscope. By default, this microscope is using 40x magnification.



1. Drag the **Coarse focus** slider until the sample is focused as well as possible. Then, improve the focus

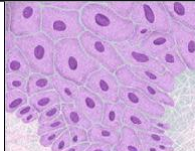
with the **Fine focus** slider. What do you see? I see the representation of the eucaryote cells in the leaf, which are a little rectangular and green, because of the chlorophyll

2. Select the 400x magnification. If necessary, adjust the fine focus. Now, what do you see?

Now, I can see the cells closer. You can even see the chloroplasts (the small green dots) and the nucleus

The individual chambers you see are **cells**, the smallest functional unit of an organism.

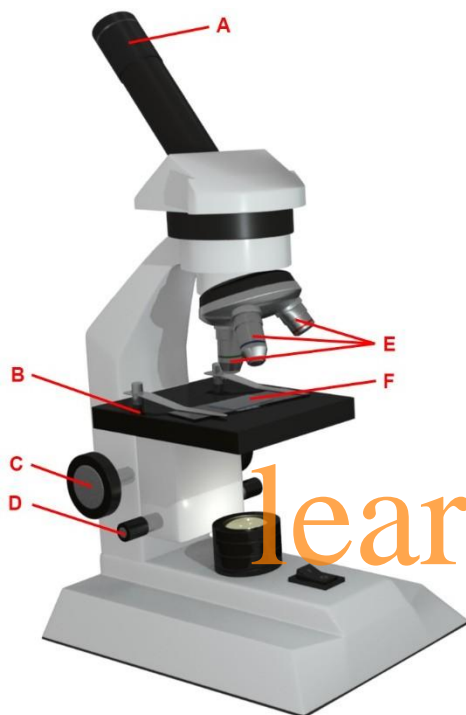


<p>Activity A: Observing cells</p>	<p>Get the Gizmo ready:</p> <ul style="list-style-type: none"> On the LANDSCAPE tab, click on the woman's right arm to choose the Human skin sample. Select the MICROSCOPE tab. 	
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Introduction: Complex organisms are made up of smaller units, called cells. Most cells are too small to be seen by the naked eye. Microscopes are used to magnify small objects, so here you will use a **compound light microscope** to observe the cells of different organisms.

Question: What are similarities and differences between cells from different organisms?

1. **Match:** Read about each microscope part. Match the description to the part on the diagram.



B Stage: Platform where a slide is placed.

A Eye piece: Lens at the top of the microscope that the user looks through. This lens most commonly magnifies a sample by 10x.

C Coarse focus knob: Large knob that moves the stage up and down to focus the sample.

D Fine focus knob: Small knob that moves the stage over a short distance to refine the focus.

E Objective lens: A second lens that further magnifies the sample. Microscopes usually have several objective lenses with different magnifications. The total magnification is the product of the eyepiece magnification and the objective lens magnification.

F Slide: A rectangular piece of glass upon which a sample is mounted for viewing under a microscope.

2. **Manipulate:** With 40x selected, use the **Coarse** and **Fine focus** sliders to focus on the sample. Then, choose 400x and focus on the sample using the **Fine focus** slider.

A. Which focus knob is easier to use at 40x? **Coarse** 400x? **Coarse**

B. Turn on **Show labels**. What structures can you see in human skin cells?

The nucleus, cytoplasm and cell membrane.

C. Turn off **Show labels** and turn on **Show scale bars**. The scale bar has a width of 20 micrometers, or 20 μm . (There are 1,000 micrometers in a millimeter.)

Using the scale bar, about how wide is a human skin cell? **About 30 μm**

