

Learning How to Use a Micropipette

Overview

One of the most useful tools in biotechnology is the **micropipette**, a precision device used to transfer very small and exact volumes of liquids in either **milliliters (mL)**, thousandths of a liter) or **microliters (μL)**, millionths of a liter). The molecules used in genetic engineering and molecular biology—DNA, RNA, and protein—are tiny, and even a minuscule drop of blood contains thousands of copies of DNA, for example. In this activity, you will learn how to use a micropipette and will get to see the relative size of different amounts of liquid measured by this very precise tool. If you have ever used an eye dropper (or a squirt gun!), you already understand how to use suction to move liquids from one place to the next. Micropipettes use suction too!

How it works

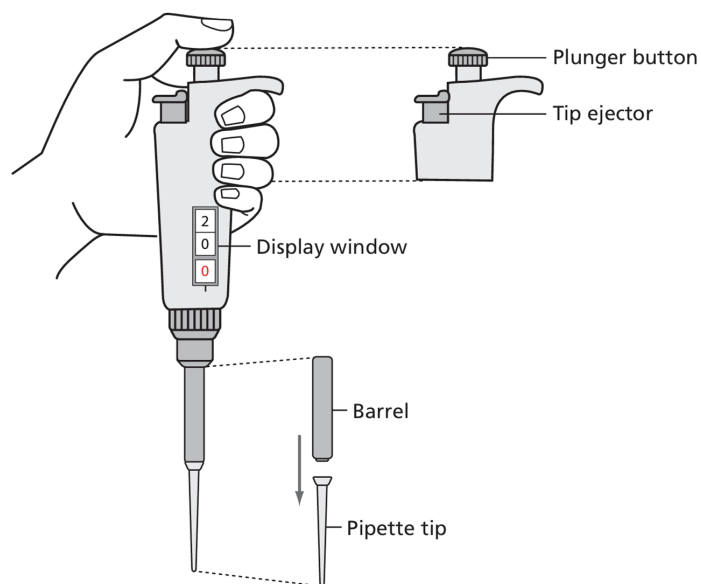
The parts of a micropipette are shown in the image at right. The **display window** shows how much fluid the micropipette can load and dispense. Some micropipettes have a wheel that adjusts the volume, whereas others are adjusted by turning the plunger. In most cases, turning to the right increases the volume, and turning to the left decreases it.

To pipette, you load your desired volume into the micropipette and then dispense it back out. First, you attach a disposable **pipette tip** to your micropipette to protect the pipette barrel. Next, you depress the **plunger button** partway to the **first stop** (the first point of resistance), then place the pipette tip into the liquid to be drawn up.

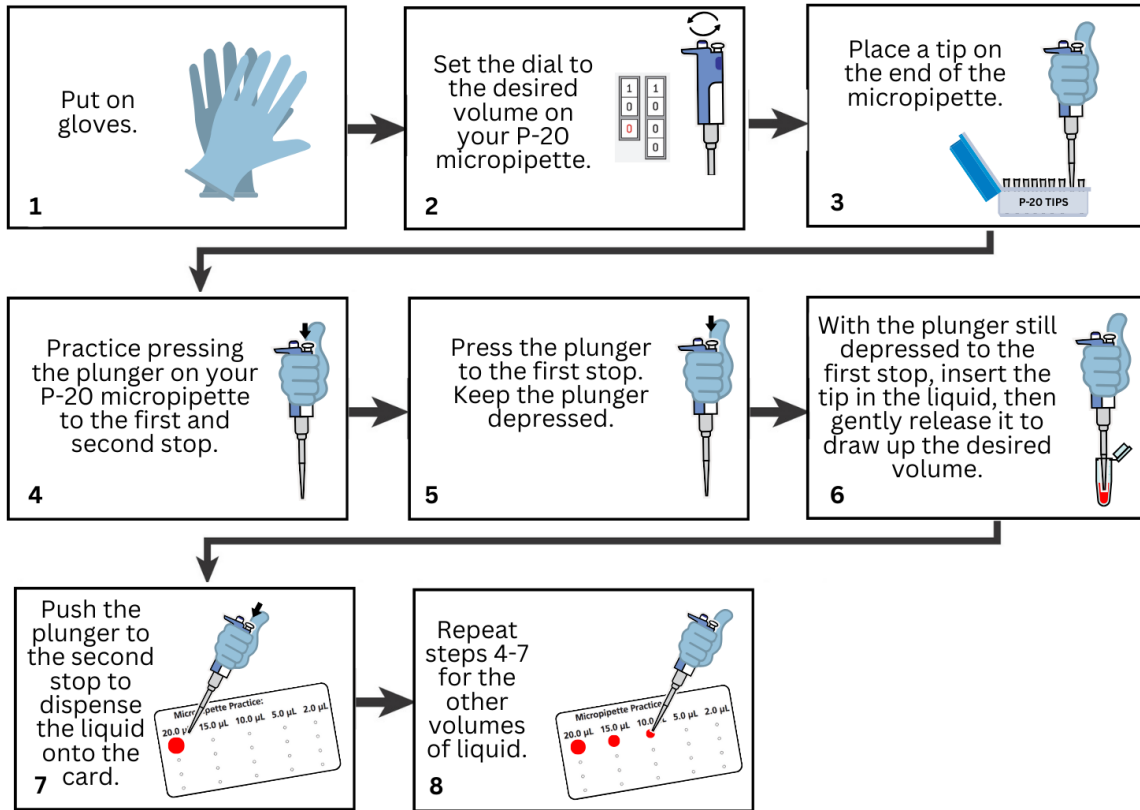
With the liquid in the pipette tip, you can dispense it onto a surface, into wells on an agarose gel, or into a container by pressing the plunger past the first stop to the **second stop**. To prevent contamination, take care to never set down a loaded micropipette nor touch the pipette tip to any surface. When you finish dispensing a solution, you can use the **tip ejector** to place your pipette tip into the waste container.

What you will explore today

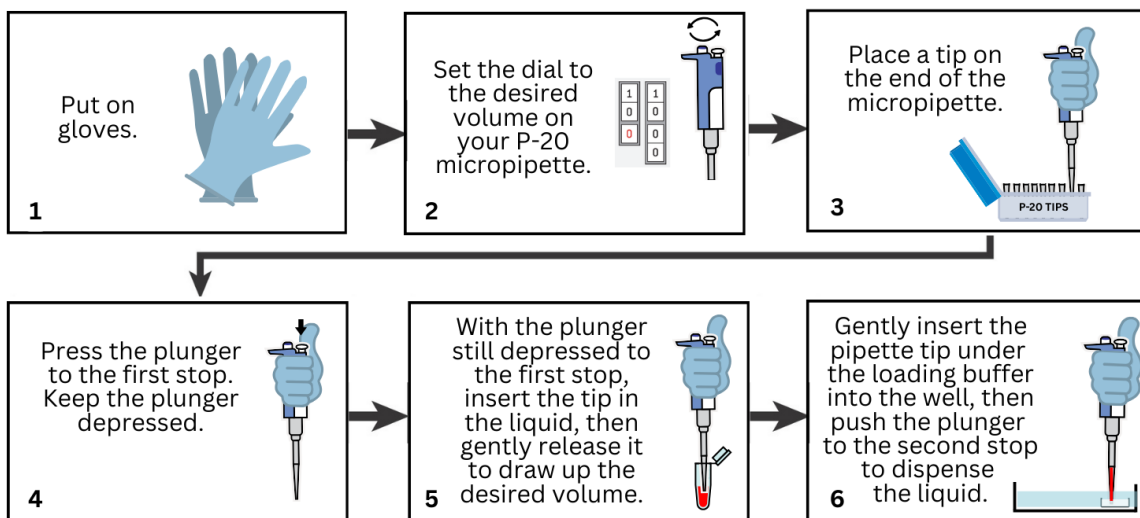
Today, you will practice adjusting the volume of P-20 micropipettes to different measurements. You will attach a pipette tip to the barrel of your device, draw up the correct volume of a dye solution, and dispense droplets onto laminated cards. You will also practice loading the wells of an agarose gel. Just how small is a 2- μL drop of liquid? You might be surprised!



HOW TO USE A MICROPIPETTE



HOW TO LOAD A GEL



20.0 μ L	15.0 μ L	10.0 μ L	5.0 μ L	2.0 μ L
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