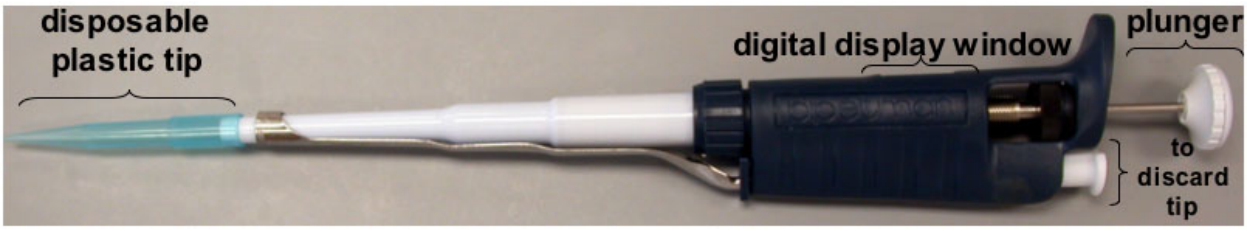
How to Use a Micropipettor



Micropipettors (a.k.a. pipettemen) are used to measure and transfer small amounts of liquids (≤ 1 mL). You will find them in almost every biology laboratory in the world. They are expensive instruments (~$250/each) that must be shared by many scientists. Thus it is imperative that you treat our micropipettors as delicate and calibrated instruments. The scales on micropipettors are in microliters (1000 μL = 1 mL). In this course you will use four different types of micropipettors. Their properties are summarized in the table below.

				
Name	**P20**	**P200**	**P1000**	**Multichannel**
Tip color	yellow	yellow	blue	yellow
Minimum Volume	1 μL	20 μL	200 μL	5 μL
Maximum Volume	20 μL	200 μL	1000 μL	50 μL
	 note: red on bottom		 note: red on top	
	volume = 10 μl	volume = 100 μL	volume = 1000 μL	

A few important directions for the operation of any micropipettor:

1) Know the limits of your micropipettor (and don't exceed those limits) of these pipettors. If you go above or below the minimum or maximum volume for a given pipettor, you will jeopardize the instrument's calibration. (Note: you can dial 210 μL on a P200, but don't!)

2) Set the desired volume by turning the centrally located rings clockwise to increase volume or counterclockwise to decrease volume.

3) Place a disposable plastic tip on the discharge end of the pipettor. NOTE: If sterile conditions are necessary, do not allow the yellow or blue plastic pipet tip to touch any object (including your hands, the bench, the side of a test tube, *etc.)*.

4) The plunger will stop at two different positions when it is depressed. The first of these stopping

points is the point of initial resistance and is the level of depression that will result in the desired volume of solution being transferred. Because this first stopping point is dependent on the volume that is being transferred, the distance you have to push the plunger to reach the point of initial resistance will change depending on the volume being pipetted. The second stopping point can be found when the plunger is depressed beyond the initial resistance until it is in contact with the body of the pipettor. At this point, the plunger cannot be depressed further. This second stopping point is used for the complete discharging of solutions from the plastic tip. You should not reach this second stop when drawing liquid into the pipettor, only when expelling the last drop. Before continuing, practice depressing the plunger to each of these stopping points until you can easily distinguish between these points.

5) Depress the plunger until you feel the initial resistance (first stop) and insert tip into your solution, just barely below the surface of the liquid and not as deep as possible. The wide (top) portion of the disposable pipette tip should never be underwater. Only the disposable pipet tip should touch the liquid; the pipettor should never touch any of the liquids. You should never rest the pipette tip on the bottom of the container (even if you have a shallow volume of liquid) because this could lead to inaccurate measurements.

6) Carefully and *slowly* release plunger. If you release the plunger too quickly, it will suck liquid up into the pipettor and damage it. NOTE: If the solution you are pipetting is viscous, allow the pipet tip to fill to final volume before removing it from solution to avoid the presence of bubbles in the plastic tip, which will result in an inaccurate volume.

7) Discharge the solution into the appropriate container by depressing plunger. This time, depress the plunger to the point of initial resistance, wait one second, and then continue pressing the plunger as far as it will go in order to discharge the entire volume of solution.

8) Discard the tip by pressing down on the tip discarder over a waste container.

9) Always change tips between solutions. You do not want to contaminate or mix your solutions with a dirty pipet tip.