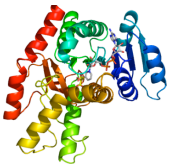
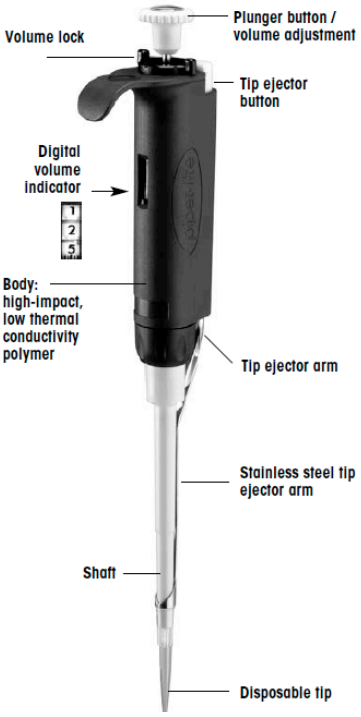
Biochemistry Lab
Pipetting Practice

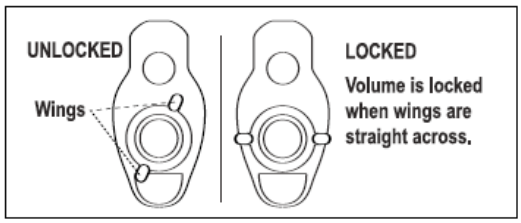


Pipetting: Pipet-Lite (LTS) is a brand of micro-pipettor used in the laboratory. Pipet-Lite is an air-displacement pipette which uses a magnetic assist and is slightly different than the Gilson pipets used in other labs. Become familiar with this pipet and it's components.

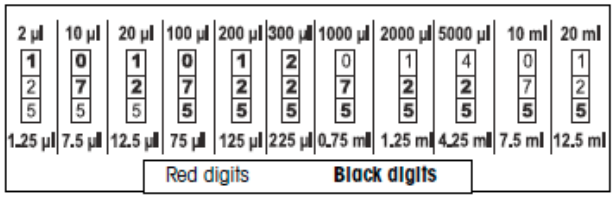


Setting Volume:

- Turn the volume lock counter-clockwise to **unlock the pipet**. The position shown at left below so the volume setting mechanism is unlocked and free to turn.

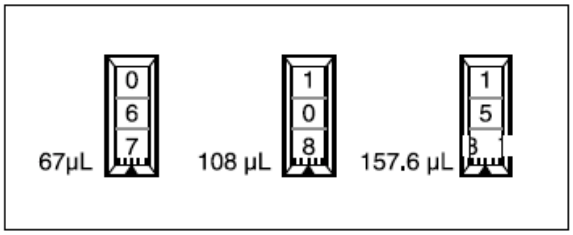


- With the mechanism unlocked, then rotate the plunger button to **change volume** – counter-clockwise to increase, and clockwise to decrease volume.



2–20 µL: Black – µL. Red – tenths, hundredths of µL.
100–300 µL: All digits black – whole µL.
1000–5000 µL: Red – mL. Black – tenths, hundredths of mL.
10 mL: Red – mL. Black – tenths of mL
20 mL: Red – mL. Black – tenths of mL.

Example volumes for the 200 µL model are shown below (note the intermediate setting at the right).



- When setting the desired volume, first turn the knob slowly clockwise until the desired volume is displayed. **Always dial down** to the desired volume.

- **Lock the pipet** by turning the volume lock clockwise (see figure above for locked position)

Operation:

- Press the plunger button tot the **first stop**, and **hold** it in this position. The magnetic latch will help you sense and hold this position.
- Holding the pipet **vertically**, place the tip into the sample at the proper depth (see tip emersion chart) and relax your thumb pressure on the plunger. Do not let go of the plunger button, or the piston may snap up quickly, resulting in inaccurate measurement.
- **Pause briefly** to ensure the full volume of sample is drawn into the tip.
- **Withdraw the tip** from the sample. If any liquid remains on the outside surface of the tip, wipe it carefully with a lint-free tissue, taking care NOT to touch the tip orifice.
- **Touch the tip end against the side wall of the receiving vessel** and press the plunger slowly, past the first stop. Wait one to two seconds.
- **Still holding the plunger down, with draw the tip. Then release the plunger.**

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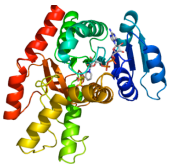

Simple pipetting tips

1. Always keep an eye on the tip to see if all of the liquid was drawn into the tip.
2. If you have picked up a significant amount of liquid with the tip touch it against a tube or a tissue, but do not wipe the tip. Capillary action will draw out some of the liquid.
3. Always add appropriate amounts of a single reagent first to reduce contamination
4. Release the liquid onto a new location in the tube or just into the liquid. DO not just shoot small volumes into the tube. This will lead to a very inaccurate pipetting.
5. The tip should be just into the liquid. Too far and you are likely to leave additional liquid on the outside of the tip and this can lead to a significant error. Slowly release the plunger. Never snap the plunger up. Pause for a second or two. Then place the tip in the receiving vessel, and depress the plunger all of the way down past the first stop to the blow out region of the plungerUse a fresh tip when switching to a new reagent
6. If the tip becomes contaminated, switch to a new one.
7. Do not contaminate the stock reagent by using a used tip from one of your tubes
8. Pipettes can be used to mix samples but be very careful in that the solution does not get into the barrel of the pipettor
9. Do not lay the pipettor down or place the tip higher than the barrel while liquid is in the tip

Micropipetting Exercise (25 points) The purpose of this exercise is to conduct the 3 volumes x 10 Weighing pipette calibration protocol using a standard table-top balance. Chose one of three pipettes at your bench for the experiment.

1. Set pipette to 10%, then 50%, and then 100% of the pipette range.
2. Pipette 10 samples of distilled water into a weigh boat on an analytical balance
3. Tare the balance before each pipetting
4. Record the weight in the table below in mg
5. Prewet the pipette tip before starting measurements.
6. Use the same pipette tip for all measurements.
7. Record the weights in Table 1, 2, and 3 respectively
8. ***Recreate the table in your lab book***

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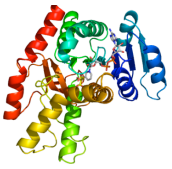

Turn in a copy of the table with the lab math for 10 points. Name _____

Table1. Weight Recordings of 10 Consecutive 10% pipette range with _____ Pipette.

Sample	1	2	3	4	5	6	7	8	9	10
Weight (mg)										
Volume (µl)										

Volume Setting (µl)			
Mean Weight (mg)		Standard Deviation (Precision)	
Mean Volume (µl)		Standard Error (Accuracy)	
Pass Accuracy		Pass Precision	

Table 2. Weight Recordings of 10 Consecutive 50% pipette range with _____ Pipette.

Sample	1	2	3	4	5	6	7	8	9	10
Weight (mg)										
Volume (µl)										

Volume Setting (µl)			
Mean Weight (mg)		Standard Deviation (Precision)	
Mean Volume (µl)		Standard Error (Accuracy)	
Pass Accuracy		Pass Precision	

Table 3. Weight Recordings of 10 Consecutive 100% pipette range with _____ Pipette.

Sample	1	2	3	4	5	6	7	8	9	10
Weight (mg)										
Volume (µl)										

Volume Setting (µl)			
Mean Weight (mg)		Standard Deviation (Precision)	
Mean Volume (µl)		Standard Error (Accuracy)	
Pass Accuracy		Pass Precision	

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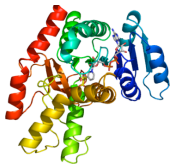

RAININ PIPET-LITE, PIPET-PLUS, AND EDP3

MODEL VOLUME	VOLUME SET µL	ACCURACY %	ACCURACY µL(±)	PRECISION %	PRECISION µL(≤)
2	0.2	12.0	0.024	6.0	0.012
	1	2.7	0.027	1.3	0.013
	2	1.5	0.030	0.7	0.014
10	1	2.5	0.025	1.2	0.012
	5	1.5	0.075	0.6	0.03
	10	1.0	0.1	0.4	0.04
20	2	7.5	0.15	2.0	0.04
	10	1.5	0.15	0.5	0.05
	20	1.0	0.2	0.3	0.06
100	10	3.5	0.35	1.0	0.1
	50	0.8	0.4	0.24	0.12
	100	0.8	0.8	0.15	0.15
200	20	2.5	0.5	1.0	0.2
	100	0.8	0.8	0.25	0.25
	200	0.8	1.6	0.15	0.3
1000	100	3.0	3	0.6	0.6
	500	0.8	4	0.2	1.0
	1000	0.8	8	0.15	1.5