

Mastering micropipetting

Instructions

In a laboratory, scientists will often need to use tiny volumes of liquids in their experiments. These volumes are usually measured in microlitres (μL), which is one thousandth ($1/1000\text{th}$) of a millilitre (mL). Scientists use micropipettes to accurately and precisely measure and transfer these very small volumes in their daily work.

Accurately using a micropipette is an essential skill for many laboratory scientists. This activity will allow you to master micropipetting so that you are ready to enter the lab!

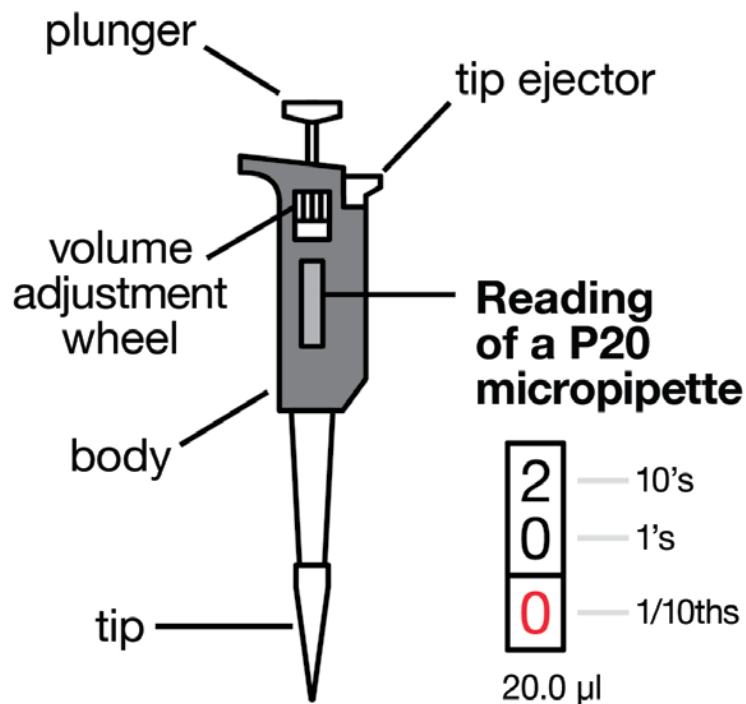
Micropipettes

Micropipettes come in different shapes and sizes, but they all work in the same way:

- A **disposable tip** – used for each individual sample and then disposed of in a designated waste disposal container, prevents contamination
- The **body** – this includes the handle grip to hold and manipulate the micropipette
- A **volume adjustment wheel** – used to alter the specific volume that the micropipette will aspirate (suck up) and dispense, which is shown in the display window
- A **display window** – allows you to read the volume the pipette is set to
- A **plunger** – used to aspirate and then dispense the required volume
- A **tip ejector** – used to eject the used tip into the designated waste disposal container

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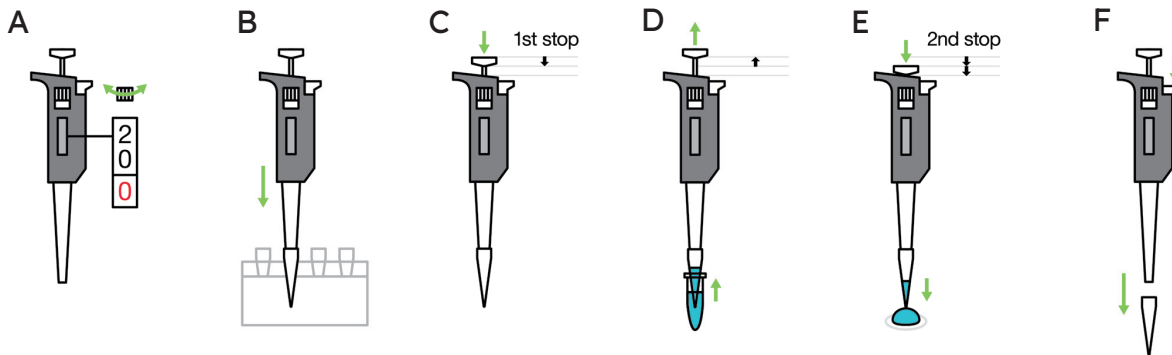
Instructions



The volumes that a micropipette can accurately dispense are written on it. In this activity you will be using either a P20 or P200 micropipette, which can accurately dispense between 2 and 20 µL (P20), or 20 and 200 µL (P200), of liquid. Setting the volume outside of this range can damage the accurately calibrated mechanisms inside the micropipette.

In the example shown above, the P20 micropipette is set to a volume of 20.0 µL. In the display window the largest number will be tens of microlitres, the second digit will be single units of microlitres and the third digit (in red) will show tenths of a microlitre.

Micropipetting method



- To use a micropipette, turn the volume adjustment wheel to set the correct volume in the display window.
- Once the volume is set, hold the body comfortably in your hand with your thumb on the plunger. Place a tip on the micropipette, by bringing it down gently into a tip in the tip box.
- Next, push the plunger down gently until you meet resistance. This is known as the first stop. A volume of air equal to the volume of liquid to be dispensed will be pushed out of the tip.
- Place the tip in the liquid to be aspirated (sucked up). Move your thumb slowly upwards to aspirate the correct volume of liquid. Moving your thumb upwards too fast can result in liquid being distributed up the inside of the tip.
- Now place your tip where the sample is to be dispensed. This time push the plunger gently, but firmly beyond the first stop until it can't go any further. This is the second stop and will dispense all of the liquid from the tip. Take care to remove the tip from the liquid before releasing the pressure from your thumb, or the liquid will be aspirated again.
- Position the micropipette over the waste disposal container and press the tip ejector button to remove the tip. When dispensing different quantities of the same food dye, the same tip can be used multiple times.