Micropipettor Practice Lab

This tip for teachers is by Jen Koenen from Hampton-Dumont High School. If you have questions, please phone Jen at 641-456-4893 (school) or e-mail her at jkoenen@hampton-dumont.k12.ia.us.

This lab was borne out of a need for students to practice with the pipettor before doing the DNA fingerprinting lab or other biotech labs. After surveying the students, I found that none of the students had experience using the micropipettor. Not wanting their inexperience to hinder the results of our fingerprinting lab, I developed a "Pipettor Practice" lab, allowing the students to practice the basics of the pipettor.

These basics included setting the instrument, working the plunger or pushbutton, and transferring liquids. Another objective was to allow them to see the minute amounts of liquid we would be working with in the lab. Most students could not visualize what a drop of 3 microliters of water would look like.

I have used this lab for the last few years. The day before we do the DNA fingerprinting lab, I divide my classes into groups of three or four students to practice working with the pipettors. For each group, you will need:

- 1 micropipettor
- 2 microcentrifuge tubes labeled #1 and #2
- 1 rack to hold the tubes (I cut a piece of chicken wire about 5”x5” and bend it like a little table.)
- 1 small beaker or tube of distilled water
- 1 petri dish or square of wax paper
- Copies of the lab sheet on the next page.

On the day of the practice lab:
1. Preview the parts of a micropipettor with the students.
2. Divide the class into groups of three or four students each.
3. Ask the groups to follow the steps on the lab sheet.
Name___________________________

**Pipettor Practice**

**Pipettor:** An instrument used to transfer exact amounts of liquid. Measured in **microliters (µl)**

1000µl = 1ml  (This activity was developed using a 2-20µl micropipettor and can be adapted for any size micropipettor.)

**Precautions:**
*Do not drop pipettor.  
*Do not run digital display below 2 or above 20.  
*ALWAYS use with a tip.  
*Do not turn yellow plunger.

1. What would the digital display look like if you set it to the following settings?

2µl  17µl  17.2µl  4µl  8.5µl  10.4µl

2. Set the digital display to the following settings and have it checked by the teacher (have each group member take a turn).

2µl___  17µl___  17.2µl___  4µl___  8.5µl___  10.4µl___

3. Have each group member do the following:
   a. Push the plunger to feel the first stop, then release…this stop is used to take up the sample.
   b. Push the plunger all the way down and release…this stop is used to expel the sample.

   **Be sure to feel the difference between the two stops**

   **~ATTACH A PIPETTE TIP NOW~**
   (Hold pipettor with display facing you…then press the end of the pipettor firmly into one of the tips in the box…gently lift it out)

4. Transfer the following amounts of distilled water from Tube #1 into 4 different places on the petri dish…observe the size of the droplets.
   a. 20µl  
   b. 10µl  
   c. 5µl  
   d. 8.5µl

5. Transfer the following amounts of distilled water from tube #1 to tube #2.
   (Remember to depress the plunger to the first stop BEFORE placing tip in your liquid)
   a. transfer 20µl of water from tube #1 to tube #2  
   b. transfer 15µl
   c. transfer 5µl  
   d. transfer 12.5µl

6. Empty and dry out tube #2.

7. Transfer the following amounts of distilled water from Tube #1 to Tube #2
   a. 3µl  
   b. 2µl  
   c. 5µl  
   d. 7µl

8. How many total microliters did you transfer to Tube #2 in step 7? ___________

9. Now set your pipettor for that amount and take up the sample in Tube #2. Were you accurate? ___________

10. Try transferring more samples until you are comfortable.