

Module 4 Schedule and Pipette Practice and Questions Expanded

Possible schedule for classroom use:

Day 1: Learn how to use micropipettors	5-10 minutes
Practice loading gels	5-10 minutes
Setting up restriction digests (A version only)	25-30 minutes
Day 2: Learn how to use propipettes	5 minutes
Learn to make the gel	10-15 minutes
Run gel and destain	30-35 minutes

PRACTICE WITH MICROPIPETTE

1. Explaining how the sample volume is measured:

A. The pipette measures from 2 to 20 microliters. (Explain that the volumes measured are very small since there are one million microliters in a liter.)

B. Have students look at the number display. Explain that 20 microliters looks like 200. Putting this diagram on the board may help. Ask them what would 5 microliters and 10 microliters look like?

	2	ten
	0	ones
Red decimal line	0	tenths

C. Explain the function of the volume adjustor.

With the number display facing you:

-----> increases volume

<----- decreases volume

2. Go over "Nevers"

A. Never rotate volume adjustor below 2 or above 20 microliters, or the pipette will jam.

B. Never use without a tip in place.

- C. Never lay the pipette down with fluid in it.
 - D. Never let the yellow button snap back.
3. Show students how to add and eject a tip. Have each student try it.
 4. Loading and emptying: Point out that the yellow button has two stops. The first stop is for filling and dispensing the sample. The second stop is to "blow out" the last little bit of the sample. Have students find the stops.
 - A. Loading:
 1. Depress button to first stop. Dip tip into sample and draw fluid up by gradually releasing button.
 2. Examine the sample. It should extend to the pipette tip. There should be no air at the tip.
 3. Make certain that the students understand the importance of depressing the button to the first stop for filling. If they depress to the second stop, they will get 5 extra microliters of sample.
 - B. Emptying:
 1. Take a clean tube and touch the pipette tip to the bottom of the tube.
 2. Depress the button to the first stop to expel the sample.
 3. Depress the button to the second stop to "blow out." Try stirring the sample while the button is still depressed.
 4. Keep the button down while removing the pipette.
 5. Gently release the button.

EXERCISE FOR STUDENTS:

1. Using the red practice solution, pipette the following amounts into a clean tube:
5 microliters, 3 microliters, 2 microliters
2. To check that your measurements were accurate, set the pipette to 10 microliters and withdraw all the solution.
 - a. Is the tip filled all the way to the end?
There should be no residue left in the tube.
 - b. If there is fluid left in the tube, or if there is an air space in the tip, your measurements were not accurate. Try again with a clean tip and tube.