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TEACHER'S GUIDE MEASURE FOR MEASURE MICROPIPETTING AND THE METRIC SYSTEM

MICROPIPET BRANDS

To the teacher:

There are 3 versions of this protocol: two for Oxford and one for Ulster and Rainin micropipets. The versions are designed to match the micropipets in the SEP kits, but can be adapted to any brand. While each version is specific to a particular brand (or brands) of micropipets, they are otherwise identical. Make sure the version you are using matches your micropipets.

Each set of micropipets in Micropipet Kit #2 contains 3 micropipet sizes rather than the usual 4 micropipets; but they cover the same range. There are a total of 24 micropipets in the kit.

Concepts: Work with DNA and enzymes frequently involves measuring very small volumes, often in the microliter range. The liter is the metric volume standard, and one microliter (μl) is one millionth of a liter. To make these precise measurements, the molecular biologist uses a micropipet. Micropipets are available in many models and sizes. SEP kits contain micropipets similar to those found in the Fred Hutchinson Cancer Research Center research labs.

Objectives: In this lab, students will learn to use micropipets accurately and to measure volumes using metric units including microliters. Mastery of this technique is essential for good results in the activities to follow.

This lab will take one class period. Preparation time ahead of class (assumes SEP kit) is approximately 1 hour.

Materials:

- 8 sets of micropipets: each set contains 3 micropipets: 0.5-10 μl , 10-100 μl , 100-1000 μl

OR

- 8 sets of micropipets: 0.5-10 μl , 2-20 μl , 20-200 μl , and 200-1000 μl
- racks of tips (3 different sizes)
- 1.5 ml microtubes (microtubes or sometimes called Eppendorf tubes)
- black permanent ink pens for marking tubes
- Saran Wrap, wax paper, or Parafilm
- 4 tubes of colored solutions with glycerol for micropipetting practice
- microcentrifuge
- beakers for used tips
- Pasteur pipets or disposable pipets
- micropipet protocol cards
- optional**, you may want to prepare practice gels following directions in the Dye Lab

References:

Seidman, Lisa and Cynthia Moore (2000) Basic Laboratory Methods for Biotechnology: Textbook and Laboratory Reference. Prentice Hall ISBN 0-13-795535-9. Paper back spiral bound costs about \$50.

Micklos, David, and Greg Freyer with David Crotty (2003, 2nd edition) DNA Science: A First Course. Cold Spring Harbor Laboratory Press. ISBN 0-87969-636-2. Hardcover \$39.95.