

## ADDITIONAL ACTIVITIES FOR STUDENTS:

### Eyedropper Analogy Activity: Introduction to the use of micropipettes

This activity accesses students' previous knowledge in order to understand how to use micropipettes, also analogies help students learn concepts.

#### Materials:

Prepare the following materials for every pair of students:

- Eyedropper
- Small beaker (about 50 mL size)
- Approximately 30 mL of water with food coloring (any color) in each beaker
- Reaction tube

In addition, have the following materials at the front counter for later use:

- 1 Turkey baster (hidden from sight until later in the period)
- 5mL pipette tip for end of turkey baster
- 1 Large beaker (about 500 mL)
- Approximately 300 mL of water with food coloring (same color as class) in the beaker
- Reading handouts with explanations of how to use the micropipettes
- Pipette use signs (taped face down on the front board or side wall).

#### Set the stage:

- Ask students to imagine that they have discovered the most valuable substance in the world, the “colored” liquid in the beakers.
- Explain to students that this substance is only valuable *IF IT IS PURE*.
- Have students brainstorm ways that the substance can be contaminated. (Ex: contact with other substances/objects, air bubbles, etc.)
- Ask students to imagine that they are responsible for transferring some of this substance with an eyedropper to a reaction tube, maintaining it pure and preserved.

#### Task 1: Writing Instructions for Using the Eyedropper

- Have each team discuss, practice and write instructions for using the eyedropper.
- Their instructions must ensure that the liquid remains pure and 100% preserved.
- Their instructions must be clear and succinct.
- Model the first step. Ask what the first step could be.
- While students work in their teams, listen to their dialogue and help them focus on the observations you want them to make (see next section). Identify teams that “get it” and praise their work. Encourage these teams to volunteer in the next section.

## Task 2: Student Volunteer Sharing and Official Pipette Use Rules

- Ask a volunteer team to read their instructions to the class and follow their procedures using the larger beaker and the turkey baster to dramatize the procedures to the class.
- While the team reads their instructions, ask the class to verify and/or add to them. Focus the discussion on the following topics (these parallel the explanations in the rules for pipette use handout):
  - Why and how we select pipette capacity. (eye dropper vs. turkey baster)
  - Why and how we are precise. (squeezing the bulb slowly to avoid splash, air bubbles, etc.)
  - Why and how we minimize contact of tip with liquid. (minimize tip contact with liquid to avoid waste)
  - Why and how we avoid bubbles.
  - Why we put the pipette to eye level. (to see level of liquid “fall” and follow with the tip)
  - Why we keep pipette vertical when in use. (avoid contamination)

### Making the connection:

- Tell students that what they have done is to write the steps for using a micropipette.
- Use the Pipet Signs on the board to show them the parallels.
- Ask students to read “How to Use a Micropipette in 10 Steps” (may assign as HW)
- Show “How To Micropipette” video or demonstrate how to use the micropipette.