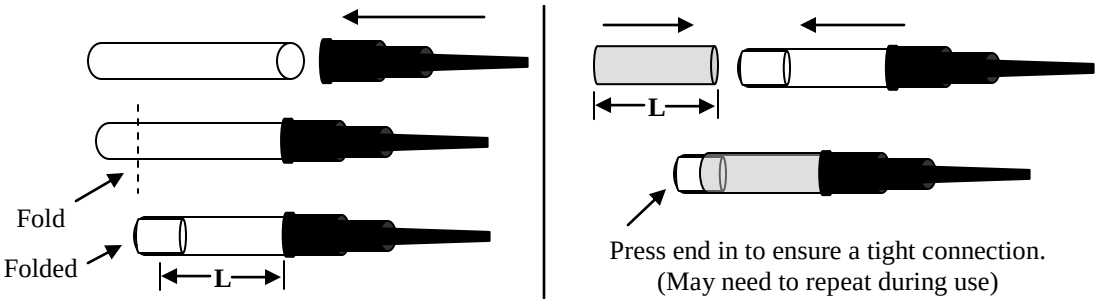
Straw Dropper for Mini Drops

An easy to make a dropper for liquid based experiments



Topics: Measurement, Surface Tension, Chemistry

Materials List

- ✓ Pipette tip
- ✓ Straw, 5cm (2") long, that will jam fit into the base of a pipette tip
- ✓ Straw section that has a slightly larger diameter than the straw above

Combining a pipette tip with sections of two straws will make a dropper that can be used to dispense tiny drops of liquid.

Assembly

1. Cut a 5 cm (2") section from a straw that can jam fit inside a pipette tip's base.
2. Slightly insert the straw section into the pipette tip's base. Place the other end of the straw down on a flat surface and **gently** press on the pipette tip.
3. Fold over the other end of the straw, starting about 1 cm (3/8") from the end.
4. Cut a straw, having a slightly larger diameter, to a length (**L**) that is a less than the distance from the base of the pipette tip to the folded end of the straw. Make one end into a very flat oval by pressing in on the sides.
5. Firmly push the folded end of the smaller diameter straw into the flat oval opening created in step 4. Persistence may be needed, as the fit will be tight.
6. Once the folded end goes into the larger straw keep sliding the straw or pushing on the end. Continue until the larger straw touches the base of the pipette tip.
7. Push firmly on the folded end of the smaller straw, which should extend beyond the end of the larger straw, to ensure a tight fit. Repeat as needed during use.

To Do and Notice

1. Squeeze the straw section sides together and insert the pipette tip into a liquid.
2. Relax the squeeze enough to draw liquid into the pipette tip and straw sections.
3. Dispense the liquid as required by squeezing on the straw section sides.

The Science Behind the Activity

Pressing on the sides of the straw sections forces air out of the inner straw through the opening in the pipette tip. Releasing the squeeze allows the straws to return to their cylindrical shape and causes a drop in the air pressure inside the straw. The greater air pressure on the liquid outside the pipette tip forces some liquid to enter the pipette tip until the pressure is equalized. When the straw sections are squeezed again the liquid in the straw is pressurized to a higher pressure than the pressure outside the pipette tip. The liquid is then pushed out of the straw section and through the pipette tip opening until the pressure is again equalized.

Taking it Further

The straw dropper can be used to measure how many drops can fit on a penny (see RAFT Idea sheet ***Drops on a Penny***), for drop races on wax paper or plastic wrap, explorations of the cohesion of liquids, and microchemistry using tiny amounts of chemicals.

Web Resources (Visit www.raft.net/raft-idea?isid=418 for more resources!)

This activity can be used to teach:

- Science & Engineering Practices (Next Generation Science Standards: Grades 3-12)

Designed and written by Michael Pollock (RAFT)