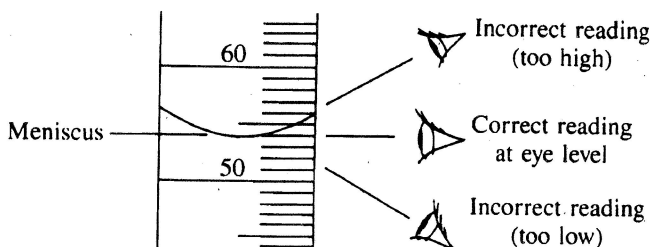


**Figure 2-1.** A 100-mL graduated cylinder with a plastic safety ring

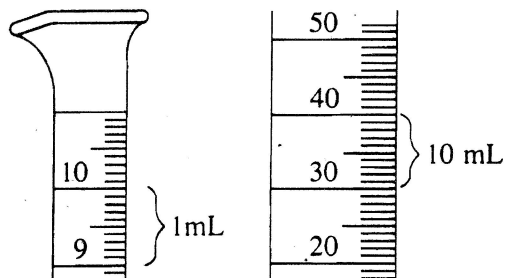
When water (or an aqueous solution) is contained in a narrow glass container such as a graduated cylinder, the liquid surface is not flat as might be expected. Rather, the liquid surface is curved downward (see Figure 2-3). This curved surface is called a **meniscus** and is caused by an interaction between the water molecules and the molecules of the glass container wall. When reading the volume of a liquid that makes a meniscus, hold the graduated cylinder so that the meniscus is at eye level, and read the liquid level at the *bottom* of the curved surface (that is, tangent to the curved surface).



**Figure 2-3.** Reading a meniscus. Read the location of the bottom of the meniscus while viewing at eye-level.

## B. Pipets

When a more precise determination of liquid volume is needed than can be provided by a graduated cylinder, a transfer pipet may be used. Pipets are especially useful if several measurements of the same volume are needed (such as in preparing similar-sized samples of a liquid substance). Two types of pipet are commonly available, as indicated in Figure 2-4. The Mohr pipet is calibrated at least at each milliliter and can be used to deliver any size sample (up to the capacity of the pipet). The volumetric transfer pipet can deliver only one size sample (as stamped on the barrel of the pipet), but generally it is easier to use and the results more reproducible.



**Figure 2-2.** Expanded view of 10-mL and 100-mL graduated cylinders. Greater precision is permitted with the 10-mL cylinder since each numbered scale division represents 1 mL.