

Introduction

Metric Lab

1. Draw and Label the biological tools and equipment located at your lab station.

2. Safety Check:

- Use common sense.
- Always work with your partner.
- Hold glassware firmly.
- Don't use fast or sudden movement while handling glassware.
- Alert your teacher immediately of glass breakage.



3. Volume measurement. Measure out 50 mL of tap water in a beaker. Pour the water from the beaker into a graduated cylinder and record the data. Make sure you use the proper way to view the meniscus as indicated in the figure to the right.

_____ mL

What is the difference between the measurement of the beaker and the graduated cylinder?

_____ mL

If there is a difference which one do you think is the most accurate reading of the two?

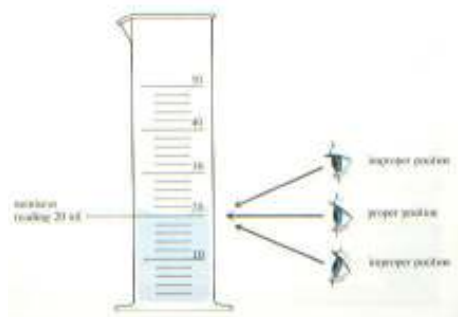


Figure 1. The proper way to view the meniscus.
From: Mader, S.S. (1998). Biology Laboratory Manual. 6th ed. WCB/McGrqwhill: Boston, MA.

4. Mass Measurement.

a. Use a balance to determine the mass in grams of 5 items. Record data below.

1. _____ 2. _____ 3. _____ 4. _____ 5. _____

b. Find the mass of the small (50 mL) beaker _____ G.

c. Find the mass of the beaker $\frac{3}{4}$ full of water _____ G.

d. Find the weight of the water (the difference between b&c) _____ G.

5. Temperature Measurement.

Find the following:

Unit	Value
Freezing	0 °C
Room Temperature	23 °C
Boiling	100 °C

Conversions:

$$^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32)$$

$$^{\circ}\text{F} = (9/5 ^{\circ}\text{C}) + 32$$

- Water freezes at either _____ °F or _____ °C.
- Water boils at either _____ °F or _____ °C.
- A room temperature of 68°F is what temperature in Celsius? _____

6. Length Measurement.

Measure the following using the proper tool. Convert units as indicated.

- The length of your index finger _____ cm, _____ mm.
- The width of your hand at the knuckles _____ cm, _____ m.
- The length from the wrist to the tip of your middle finger _____ cm, _____ mm.
- The length from the elbow to the tip of your middle finger _____ cm, _____ m.
- Select 5 large or long objects in the room. Have your partner estimate the length in meters. Then measure the distance. Record the difference between the two in the following spaces.

1. _____ 2. _____ 3. _____ 4. _____ 5. _____

6. Time Measurement. Convert units as indicated.

- How many hours are there 1 year? _____ (hrs.) _____ (days).
- How many seconds are there in 2 years? _____ (s). _____ (min.).