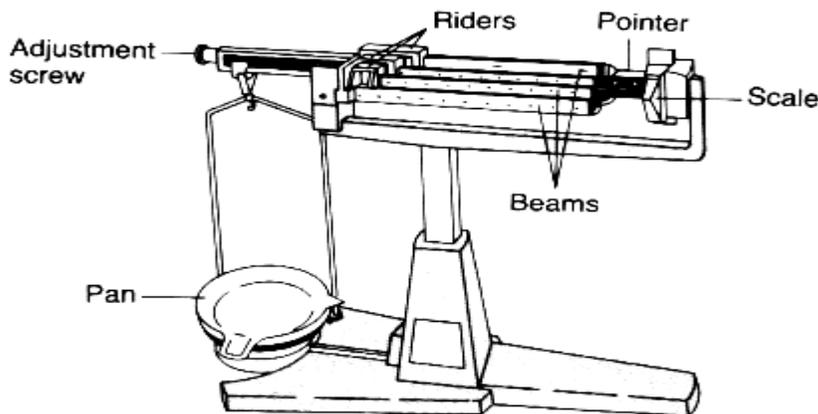


# Triple Beam Balance

## MEASURING MASS

There are various types of laboratory balances. The triple beam balance you use may look somewhat different from the one in the Figure below; however all beam balances have some common features.



### Carrying the Balance

1. Be sure all riders are back to the zero point.
2. Now, slide the 100 gram rider ALL THE WAY TO THE END to avoid rattling the beams.
3. Place one hand under the balance and the other hand on the support (arm) to carry the balance.

### Using the Balance

1. **Zero the balance** before you determine the mass of any substance.
  - a) Slide all of the riders back to the zero point.
  - b) Check to see that the pointer swings freely along the scale.
  - c) Use the adjustment screw to obtain an equal swing of the beams, if necessary. You do not have to wait for the pointer to stop at the zero point. The beam should swing an equal distance above and below the zero point.

You must repeat this procedure to "zero" the balance every time you use it.

2. *Never put a hot object directly on the balance pan.* Any dry chemical that is to be massed should be placed on paper or in a container. *Never pour chemicals directly on the balance pan.* Remember to mass the paper or container before adding the substance.

3. Once you have placed the object to be massed on the pan, move the riders along the beams beginning with the largest mass first. If the beams are notched, make sure all riders are in a notch before you take a reading. Remember; the pointer does not have to stop swinging, but the swing should be an equal distance above and below the zero point on the scale.

# MEASURING MASS WITH THE TRIPLE BEAM BALANCE LAB

## Objectives:

- to learn the correct way to use a Triple Beam Balance
- to learn the parts of a Triple Beam Balance.
- to take precise measurements when finding the mass of an object
- to find the mass of known and unknown quantities

## Materials:

- Film canisters labeled A - Z filled with different masses.
- Triple Beam Balances

## Procedure:

1. Listen and watch carefully to the demonstration on how to use the Triple Beam Balance.
2. You and your partner will share a triple beam balance.
3. Check to see that the **Pointer** is pointing to zero.
4. If it is not, check to see that all the **Riders** are all the way to the left at the Zero mark.
5. Adjust the balance by turning the **Adjustment Screw** *slowly* until it points to zero.
6. Find the mass of the unknown film canisters.
7. Record canister letter and mass in **Table 1**.

## Part 1: finding the mass of a substance

**Table 1.**

Canister Letter												
Measured Mass												
Actual Mass												
Error: (Actual) - (Measured)												

**Table 1 continued**

Canister Letter												
Measured Mass												
Actual Mass												
Error: (Actual) - (Measured)												

**NOW: ADD UP ALL OF YOUR ERRORS, AND DIVIDE BY THE TOTAL # OF CANNISTERS THAT YOU MEASURED. THIS IS YOUR AVERAGE ERROR. RECORD THIS NUMBER IN THE BLANK BELOW:**

\_\_\_\_\_

**Part 2: Gathering a given Mass of a solid.** *Remember to use weighing papers.*

You need 2.2 grams of paper clips. How many paper clips is this?

You need 10 grams of paper clips. How many paper clips is this?

**Part 3: Mass of water.** *Remember to use a beaker.*

You need 100 grams of water. How many mL is this?

**Questions:**

1. How should you hold a triple beam balance?
2. What is the range of measurement on the triple beam balance?
3. Is it easier to measure a small mass or a large mass and why?
4. What number is the metric system based on?
5. In part 3 what did you notice about the relationship between the volume and mass of water?
6. Choose one of the canisters and convert your answer to the following units:
  - kg –
  - mg-
  - dag-
  - dg-
  - cg-
  - hg-

Visit the following site for practice measuring mass:

<http://www.sd54.k12.il.us/schools/mead/teams/encores/krs/Meas/meas.htm>