The Balance

The balance is a device used to measure the mass of an object.

❖ Types of balance

balances are designed to measure small masses from around 320g to sub-milligram. There are many types of balances, we will take the main types of laboratory balance are:

1- **Top-pan balance** (200g – 0.001g)

2- **Analytical balance** (320g – 0.0001g)

3- **Microbalance** (6g – 0.000001g)

4- **Ultra microbalance** (6g – 0.0000001g)

❖ The principle of balance:

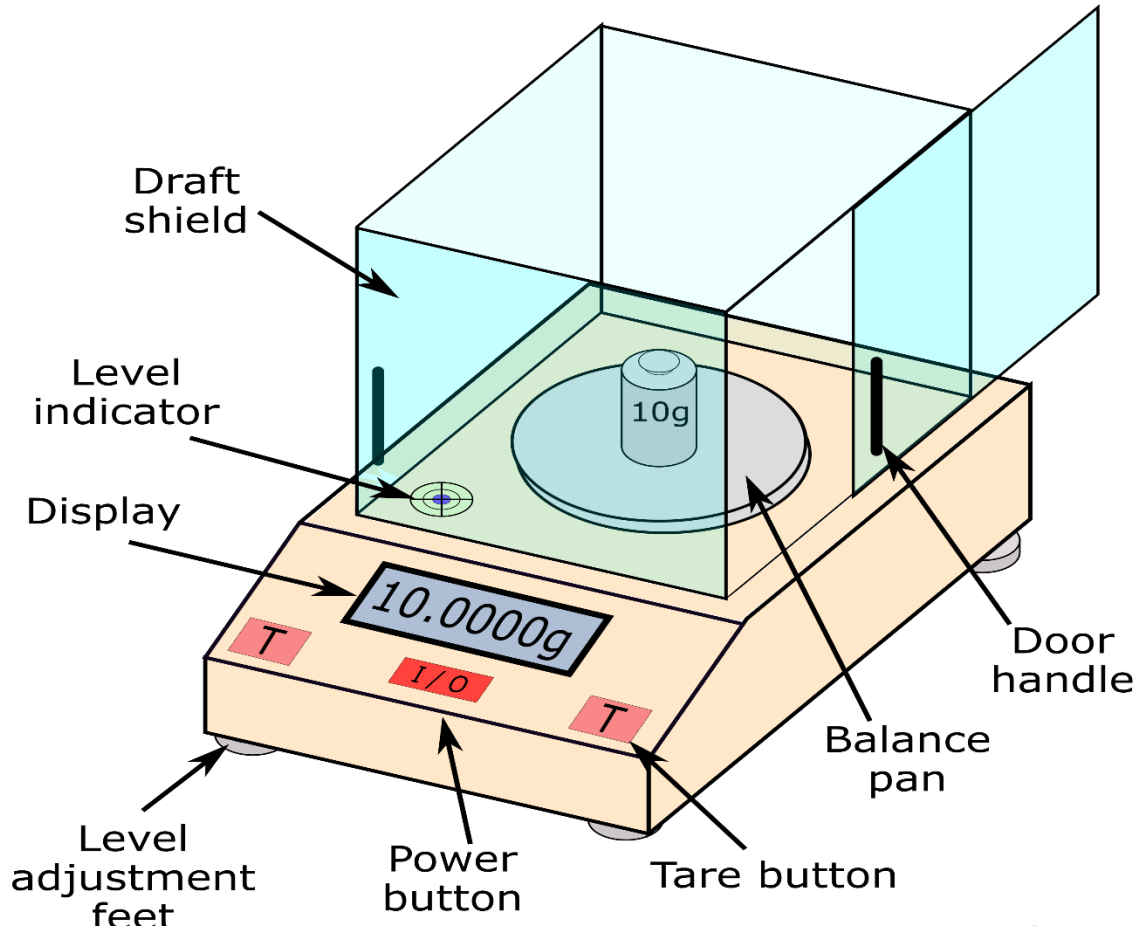
Balances do not directly measure mass; they measure the force (weight) that acts downward on the balance pan. Most analytical balances are electromagnetic balances and so measure this weight using an electromagnet.

In the lab for daily weighing the Analytical Balance, it is considered the most used.

❖ Analytical Balance

Very accurate balances, called analytical balances, are used in scientific fields. An analytical balance is a class of balance designed to measure small mass in the sub-milligram range.

- **The part of the Analytical Balance**:



The operate of analytic balance:

1. Ensure that the instrument is clean and free from dust with smooth brush or lint-free duster.
2. Adjusting the bubble at the center (To put the balance in a balanced way).
3. Before using ensure that the balance is calibrated.
4. While weighing any sample use butter paper & spatula.
5. Carefully remove any sample residue / spilt powder.
6. Take special care during weighing of liquids.
7. Before closure ensure that the pan is empty.

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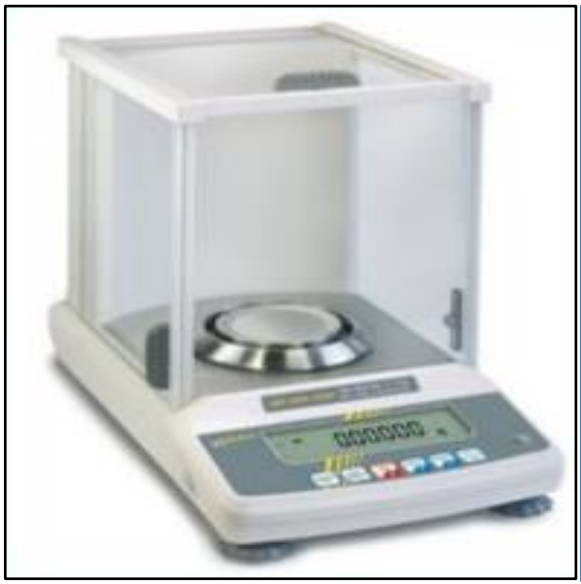
Analytical Balance:It is used to measure mass to a very high degree of precision.

The weighing pans of analytical balance are inside see-through enclosure with doors so that
dust does not collect and so any air currents in the room do not affect the delicate
balance

These balances are used:

1. To weigh small quantities usually in milligram(mg) range.
2. When great accuracy is required .



Analytical Balance

Parts of analytical balance:

- **Pan :** Flat rigid support on which the specimen is placed .
- **Glass doors** : Sliding door that provide easy access to the inside of the glass case.
- **Digital readout** : To show various numeric information .
- **Zero button**.
- **Calibration button** .

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Uses of balances:

1. Read carefully the manufacturer's instructions.
2. Always handle a balance with care.
3. Before starting to weigh, zero the balance as directed by the manufacturer. If using a beam balance, check the position of the beam.
4. Weight the chemicals at room temperature in a weighing scoop or small beaker.
5. When adding or removing a chemical, remove the container to avoid spilling any chemical on the balance.
6. When using an analytical double pan balance, bring the pans to rest before adding or removing a chemical.
7. Always use forceps to add or remove weights.

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Care of balances:

1. Keep the balance clean and don't let dirt accumulate near the pivots and bearings.
2. Silica gel should be kept inside the analytical balance case to remove any moisture present in the atmosphere.
3. Protect the weights from dust, moisture and fungal growth.
4. Position the balance on a firm bench away from vibration and direct sunlight.
5. Never put the chemicals directly on the balance pan.
6. Use small brush to remove any chemical, which may have been spilt on the balance.