**2.2 Newton's Law of motion**

AIM: Validate Newton's second law.

1. Find the relationship between acceleration and external force and draw a graph with acceleration against force.

2. Find the relationship between acceleration and total mass of the system and draw a graph with acceleration against the reciprocal of total mass.

EQUIPMENTS:

1. Air track,

2. air pump,

3. light gates,

4. digital timer,

5. glider,

6. weights,

7. little bucket, string,

8. digital balance.
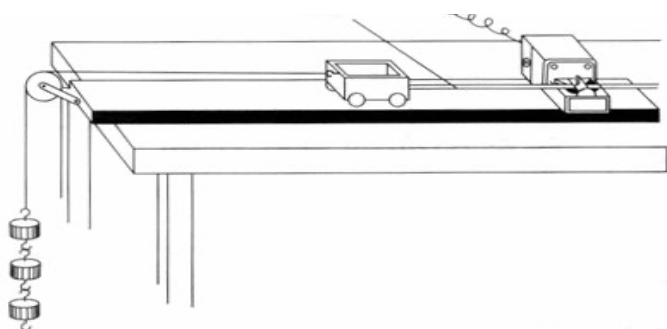
REQUIREMENTS:

1. Data collecting

- 1.1 Set up the equipments as the diagram.

- 1.2 Remain the mass of the glider as constant and change the number of the masses.

- 1.3 Collect the acceleration and the external force of the glider each time.

- 1.4 Organize the raw data in a data table with units and uncertainties.

- 1.5 (optional): Remain the number of the masses constant and change the mass of the glider.

- **2. Data processing**

- 2.1. Use the digital balance the measure the weight of the glider.

- 2.2 Calculate the weight of the masses as the external force.

- 2.3 Find the relation between acceleration and the external force.

- 2.4 Draw an acceleration Vs Force graph with error bars.

- 2.5. Find the relation between acceleration and the mass.

The LAB REPORT:

1. You should have:

- 1.1 Raw data with units and uncertainties;

- 1.2 Sample of the progress to calculate external force.

- 1.3 Processed data with units and uncertainties.

- 1.4 Sample of the progress to calculate uncertainties of F.

- 1.5 a-F graph with error bars.

- 1.6 Evaluation.