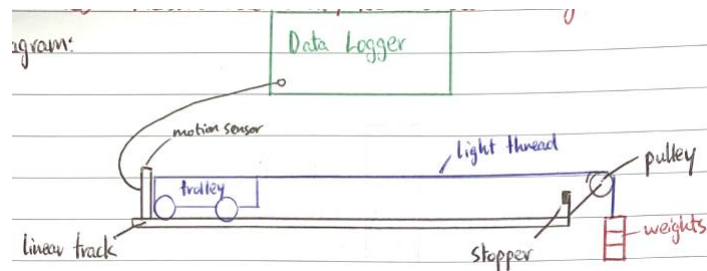


Mechanics Experiment #1

Measure Acceleration/Newton's Second Law of Motion

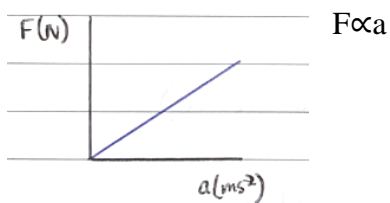
Diagram



Method: - Spirit level - horizontal track

- data logger - read average acceleration (ms^{-2})
- motion sensor - on - let go of car
 - off - hit stopper
- ignore last few results as car rebounds off stopper
- repeat with different weights.

Graph:



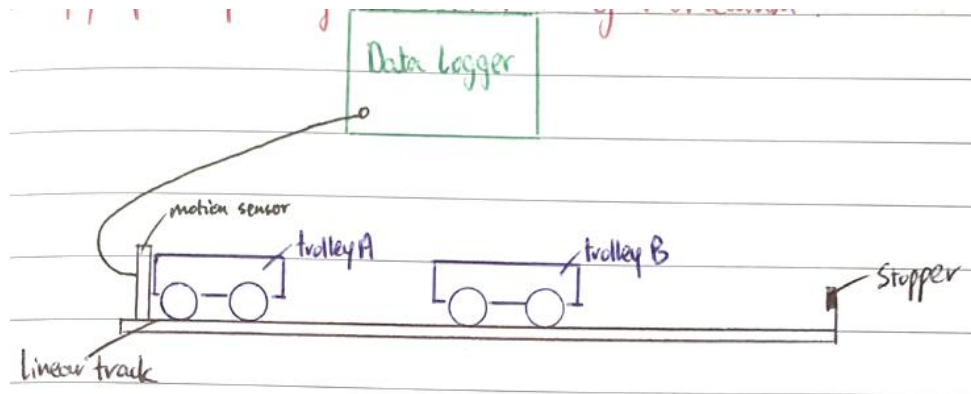
Errors + Precautions - linear track - levelling screws + spirit level

- well designed wheels - reduce friction
- frictionless pulley
- mass of car $>$ mass of weights

Mechanics Experiment #2

Verify principle of conservation of momentum

Diagram:



- Method:**
- ensure track is horizontal - spirit level
 - car A at motion sensor, car B half-way down track
 - data logger measure velocity
 - gentle push - constant velocity
 - velcro pads between cars to stick together
 - repeat with bigger pushes each time

Calculations:

$$m_1u_1 + m_2u_2 = m_1v_1 + m_2v_2$$

- Errors + Precautions:**
- linear track horizontal - leveling screws + spirit level
 - eliminate effect of gravity
 - well designed wheels reduce friction
 - velcro pads - ensure the cars stick together on collision