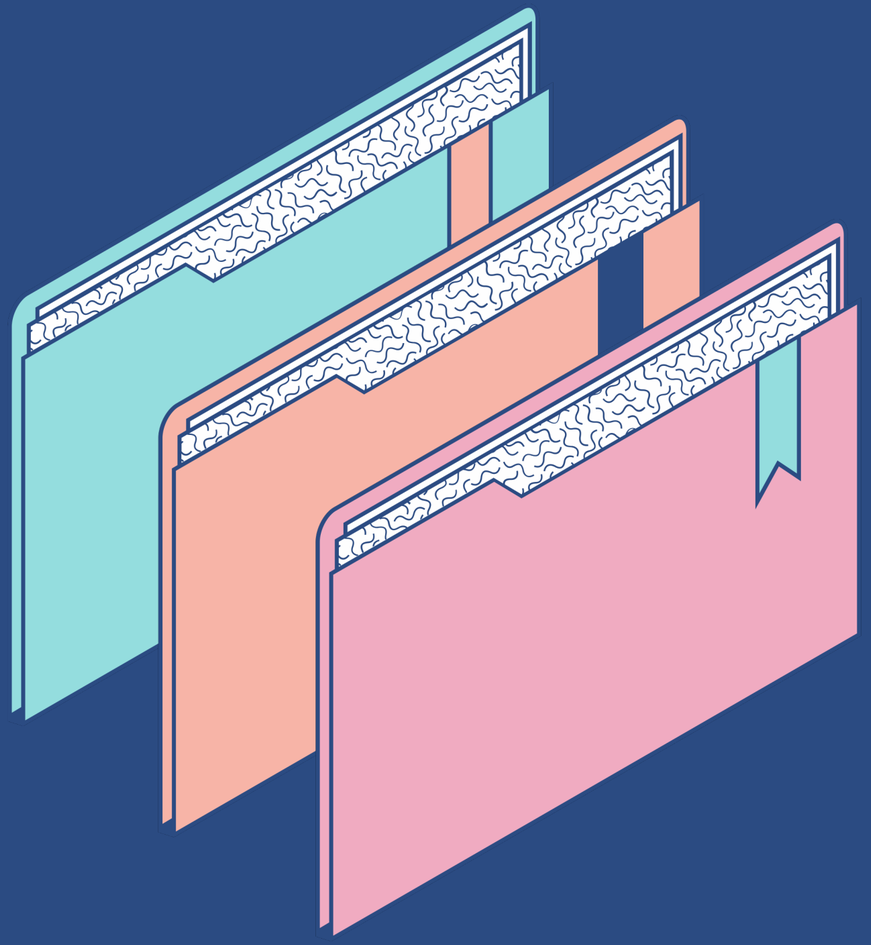
PhysiXplore

Session 1 - Newton’s Second Law

by Amanda Jiang

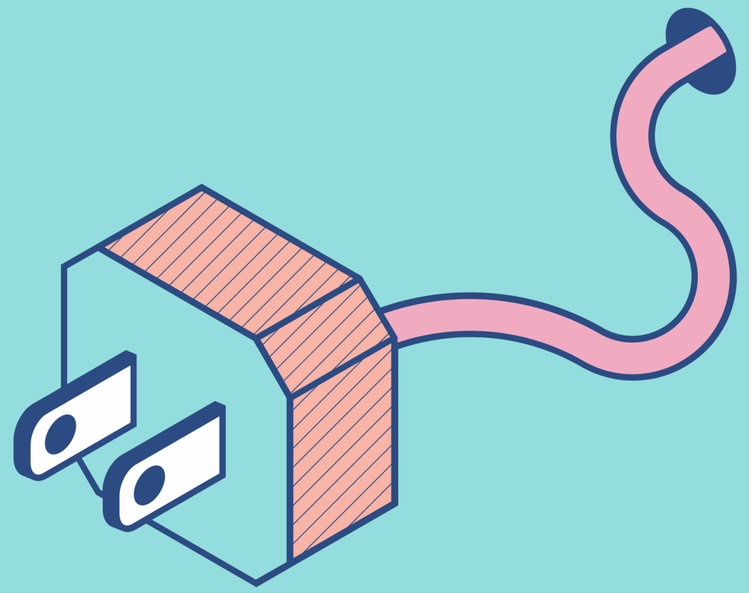


Agenda

- Introduction to Physics
- What we do in every session
- Start experiment - Newton’s Second Law

What is Physics?

The Impact of Technology on Teaching and Learning



What We Do in Each Session

1 STEP

Introduce a specific physics concept

2 STEP

Introduce the experiment

3 STEP

Reading procedues

4 STEP

Start doing experiments

5 STEP

Analyze the results and compare to the concept we first introduced

Newton’s Second Law of Motion

Kinematics

DISPLACEMENT,
VELOCITY, ACCELERATION

Displacement

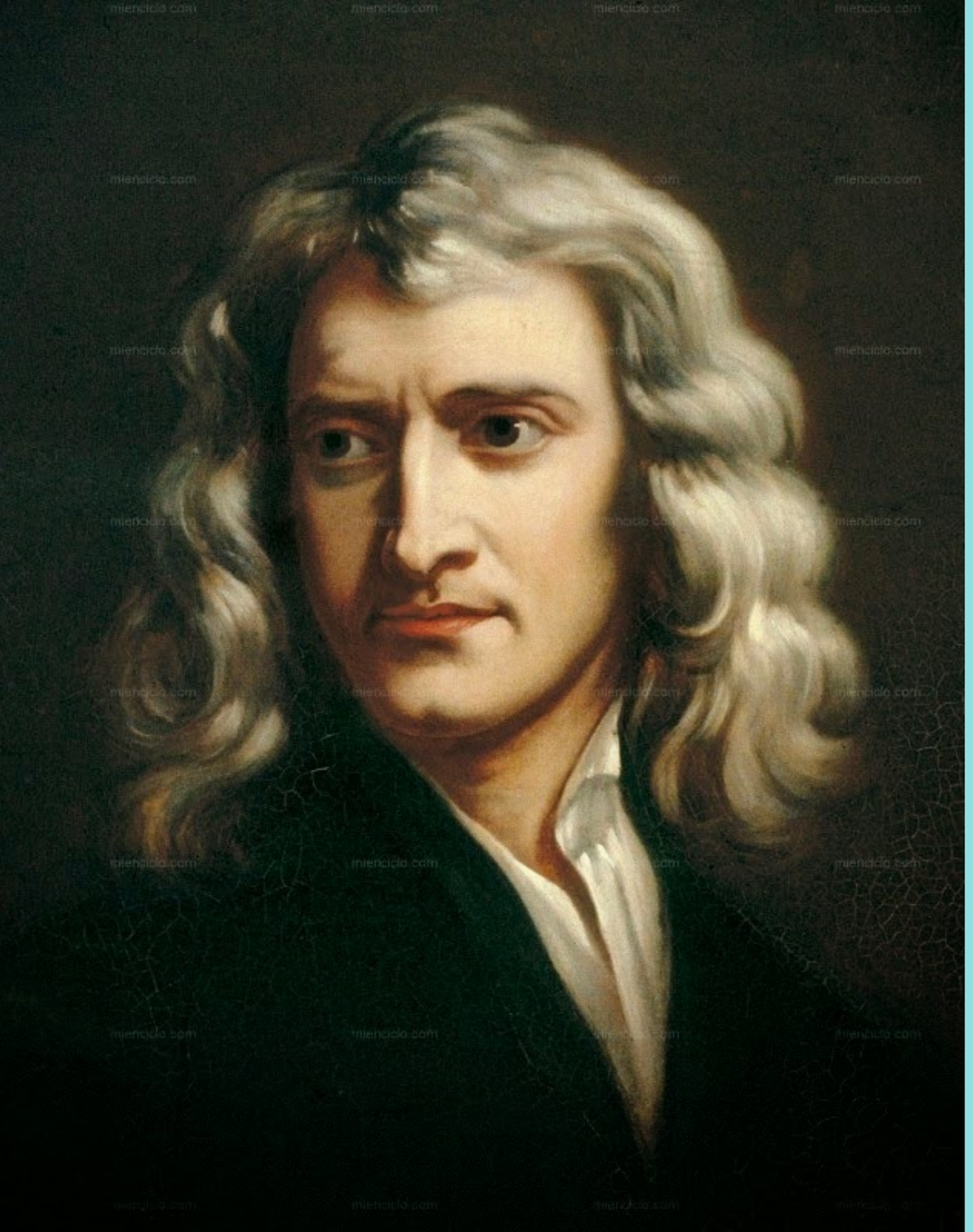
change in position

Velocity

rate of change of position

Acceleration

rate of change in velocity



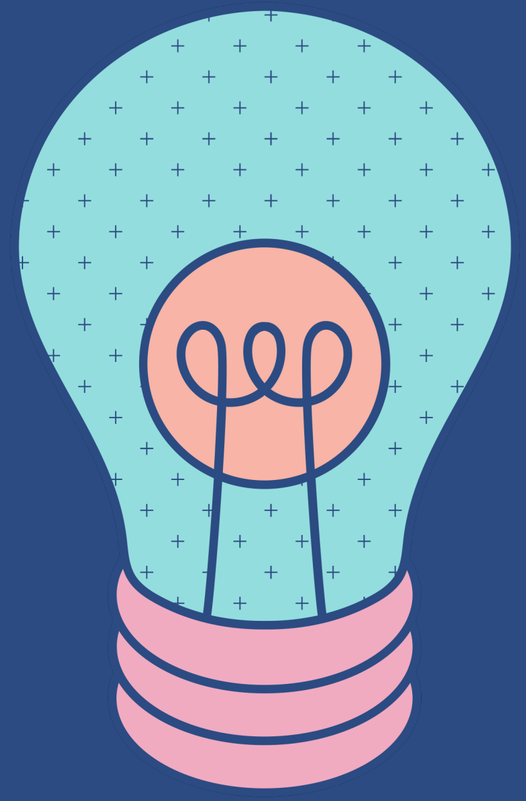
Newton’s Second Law of Motion

F=ma

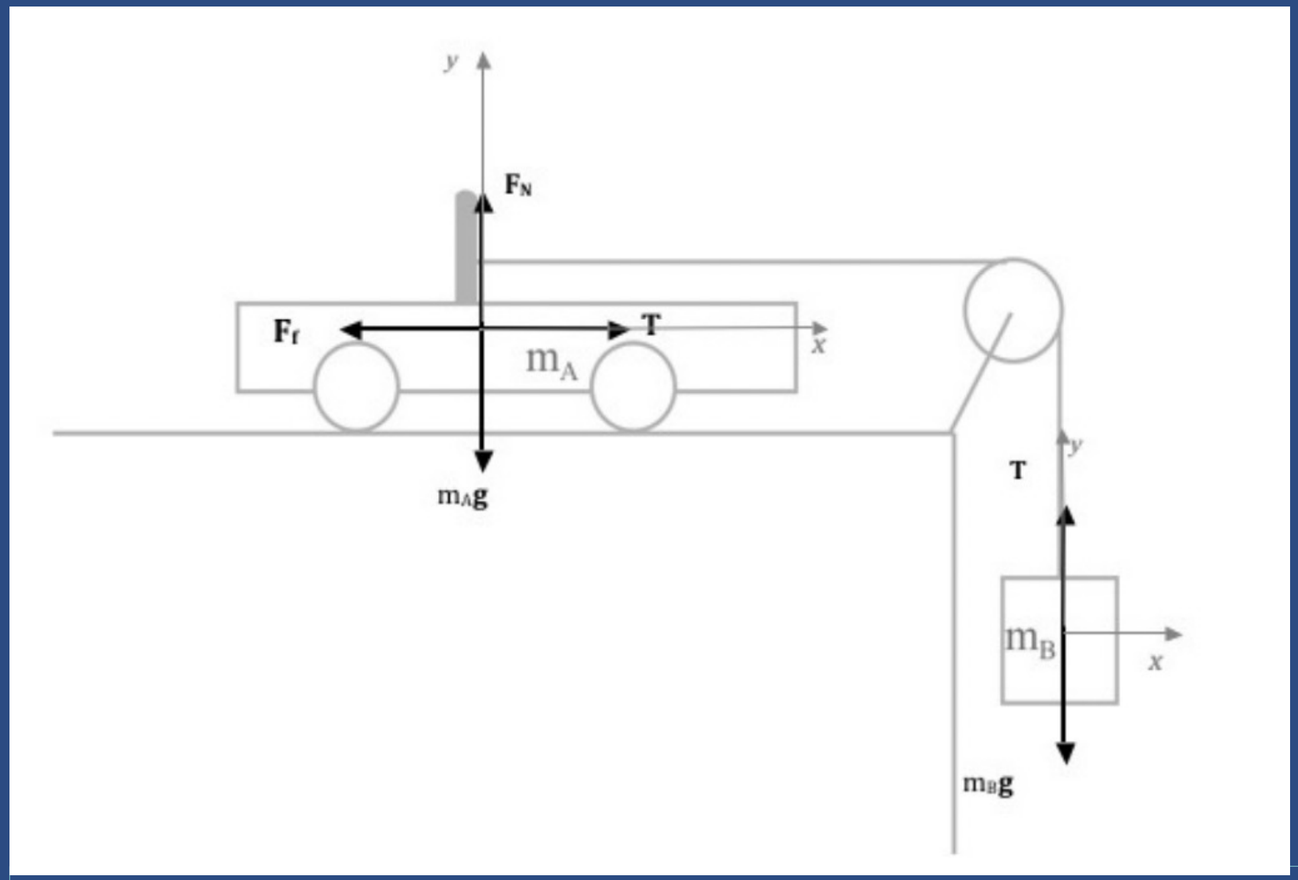
- Force is proportional to acceleration

Key Objective:

- Finding the Tension
- Compare your experimental results with theoretical value



Principle Behind



Step 1: cart-mass system

- Force: gravitational force (Fg=mg)
- Mass: cart + hanging mass

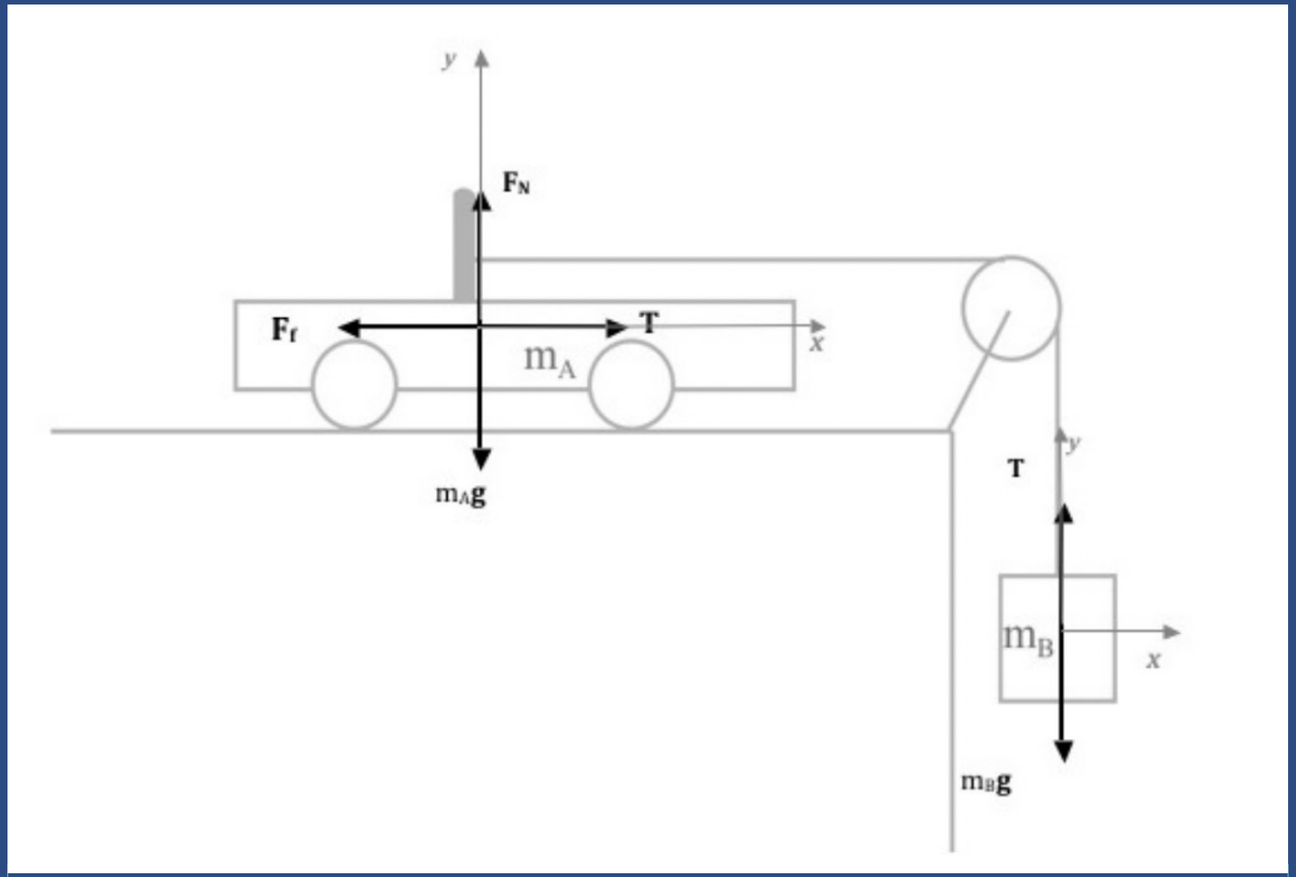
Step 2: cart system

- Force: tension (same as gravitational force)
- Mass: cart

Hint: same acceleration

Theoretical Calculation

(more in AP Physics)



$$a = \frac{m_B g}{m_A + m_B}$$

$$T = m_A a = m_A \frac{m_B g}{m_A + m_B}$$