

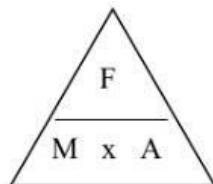
Newton's Second Law

A. Select the correct term to complete these sentences:

When a resultant force acts on a mass, its _____ increases in the direction of that force. This change of speed is called an _____. The greater the force acting on the mass, the _____ its acceleration.

The acceleration is related to the mass and force as shown:

$$\text{Force} = \text{Mass} \times \text{Acceleration}$$
$$(N) \quad (kg) \quad (m/s^2)$$



N = Newtons

kg = Kilograms

m/s² = metres per second squared

B. Answer these questions to 2 decimal places and select the appropriate units.

1. What force is needed to accelerate a 23Kg mass at a rate of 12 m/s²?
2. A 50g toy car is pushed with a force of 1N. Calculate its acceleration.
3. What is the weight (a force) of a 1Kg mass? (The acceleration due to gravity = 10m/s²)
4. What mass has a motorbike, if a force of 1,800N from the engine gives it an acceleration of 6m/s²?
5. A firework rocket has a mass of 120g. Immediately after lift off, the force created by the burning powder is 3.0N, but the friction due to air resistance equals 0.86N:
 - a. Calculate the acceleration of the rocket at this time.
 - b. As the speed of the rocket increases, the size of the friction force due to air resistance also increases. How would this affect the acceleration of the rocket?
 - c. The acceleration was found not to change as much as anticipated. What factor could be causing this to occur?