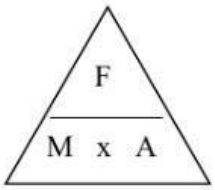
Newton's Second Law

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:

Force =	Mass x	Acceleration
(N)	(kg)	(m/s^2)



N = Newtons kg = Kilograms m/s^2 = 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/s^2?

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 = $10m/s^2$)

4. What mass has a motorbike, if a force of 1,800N from the engine gives it an acceleration of $6m/s^2$?

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?