**Average Force Formula**

The force applied by a body that's traveling at a definite velocity (rate of speed) for a definite period of time is the average force. The word *'average'* is made use of to specify that this velocity is not an accurately measured or *'instantaneous'* velocity. Therefore, the mass of the body multiplied by the average velocity over the definite time is equivalent to average force.

For a particular interval of time **t,** the force is described as the frequency of change of momentum. It is hard to compute the rate of change if the time interval is minor. There the term, average force makes an entrance.

Over a period of intervals (Δ t) the rate of change of momentum is Average force. It is given by

$$F = \frac{m(V_f - V_i)}{\Delta_t}$$

Where,
the mass of the body is m,
the final momentum is $v_f$,
the initial momentum is $v_i$,
the change in time is Δ t.

The **Average Force Formula** aids one in getting the rate of change of momentum for any number of time intervals (Δ t). Expressed in **Newton (N)**.

**Average Force – Samples**

**Problem 1:** A child throws bowling ball having a mass of 5 kg and it rolls with a velocity of 4 m/s for 1 s. Compute its average force?
**Answer:**

Known: Mass of bowling ball m = 5 kg,
Initial velocity $v_i$ = 0
Final velocity $v_f$ = 4 m/s

$$The\ Average\ Force\ is\ given\ by$$
$$F = \frac{m(V_f - V_i)}{\Delta_t}$$

$$= \frac{5(4-0)}{1}$$

$$= 20\,N$$

**Problem 2:** A rubber ball of mass 0.25 kg rolls over the gravel with velocity 1.5 m/s and halts after 2 s. Compute its average force?
**Answer:**

Known: m = 0.25 kg, (Mass of the ball)
v = 1.5 m/s, (Velocity of ball)

The Average force is given by

$$F = \frac{mv}{t} = \frac{0.25 \times 1.5}{2} = 0.1875\,N$$