

Stopping of Two Blocks Due to Friction.

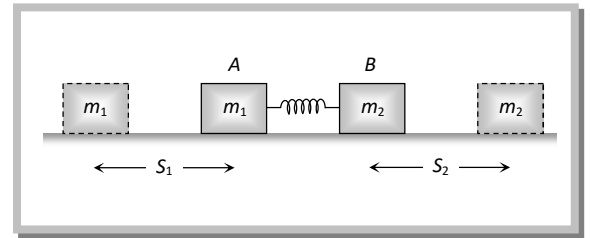
When two masses compressed towards each other and suddenly released then energy acquired by each block will be dissipated against friction and finally block comes to rest

i.e., $F \times S = E$ [Where F = Friction, S = Distance covered by block, E = Initial kinetic energy of the block]

$$\Rightarrow F \times S = \frac{P^2}{2m} \quad [\text{Where } P = \text{momentum of block}]$$

$$\Rightarrow \mu mg \times S = \frac{P^2}{2m} \quad [\text{As } F = \mu mg]$$

$$\Rightarrow S = \frac{P^2}{2\mu m^2 g}$$



In a given condition P and μ are same for both the blocks.

$$\text{So } S \propto \frac{1}{m^2} \therefore \frac{S_1}{S_2} = \left[\frac{m_2}{m_1} \right]^2$$