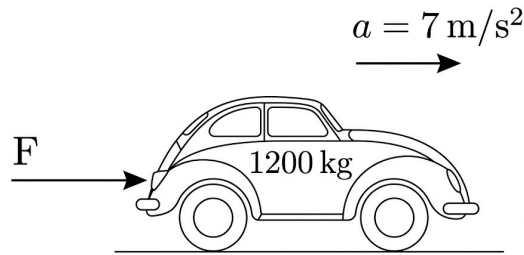


1. An automobile has a 1,200 kg mass and is accelerated to 7 m/s^2 . Determine the force required to perform acceleration.



This problem is solved using **Newton's Second Law of Motion (Law of Acceleration)**, which states that an object will accelerate in a direction directly proportional to the unbalanced force acting on it.

$$F = m \left(\frac{a_o}{g_c} \right)$$

$$F = 1,200 \text{ kg} \left(\frac{7 \frac{\text{m}}{\text{s}^2}}{1 \frac{\text{kg-m}}{\text{N-s}^2}} \right)$$

$$F = 8,400 \text{ N}$$

To make a heavy 1,200 kg vehicle change its velocity rapidly—specifically increasing its speed by 7 meters per second every single second—it requires a continuous push of **8,400 N** of net force. If the car were lighter, or if the desired acceleration were lower, less force would be required.