

# Newton's Laws of Motion

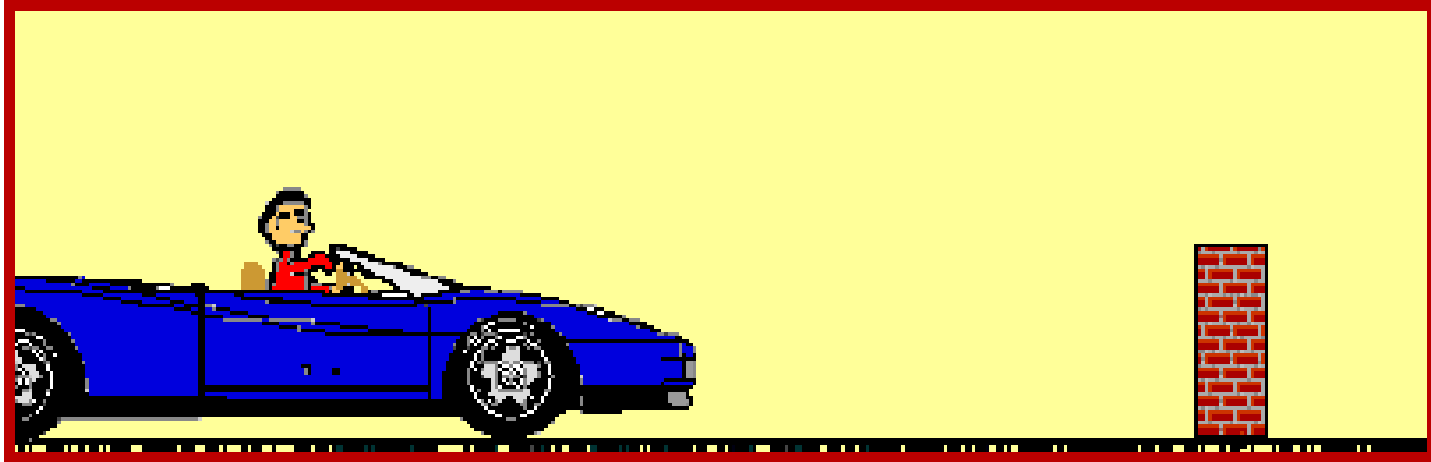


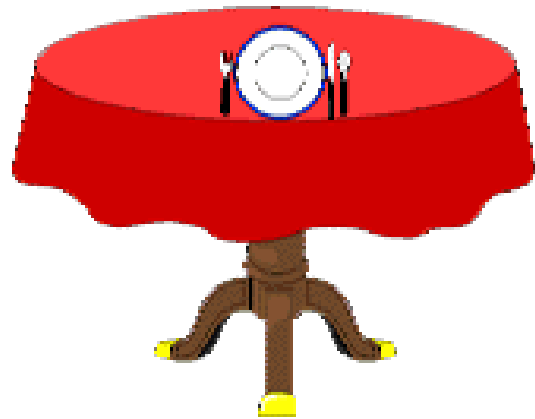
# Sir Issac Newton 1643-1727

- Attended private schools and Cambridge University in England
- Worked as an alchemist
- *Principles of Mathematics* published in 1687 is considered the most influential book in the history of science
- Died of possible mercury poisoning
- Said to be more influential than Einstein

# First Law of Motion (Galileo's Law of Inertia)

“If no net force acts on an object, it maintains its state of rest or its constant speed in a straight line”



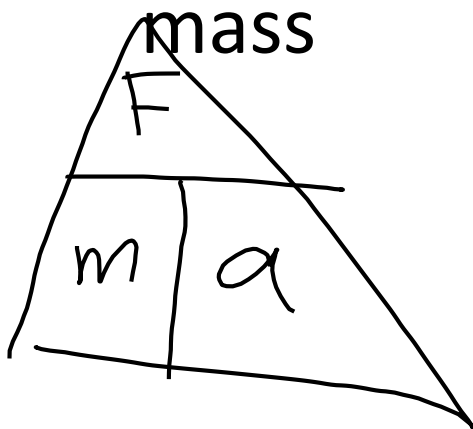


# Second Law of Motion

If an unbalanced force acts on an object, the object will accelerate in the direction of the net force

The acceleration is proportional to the net force

The acceleration is inversely proportional to the



$$\vec{F}_{net} = m\vec{a}$$

Ex. What is the acceleration of an 80 kg skier, acted upon by an unbalanced force of 173 N [S]?

$$a = ?$$

$$m = 80 \text{ kg}$$

$$F_{\text{net}} = 173 \text{ N [S]}$$

$$F_{\text{net}}$$

$$a = \frac{F_{\text{net}}}{m}$$

$$a = \frac{173}{80} = 2.1625 \text{ m/s}^2 \text{ [S]}$$

p. 42 # 2, 3, 5



# Third Law of Motion

“For every action force, there exists a reaction force that is equal in magnitude but opposite in direction”



