

Newton's Laws

By Ms Toal

FIRST LAW OF MOTION:

- An object at rest will stay at rest and an object in motion remains in motion at constant speed and in a straight line unless acted upon by an unbalanced force. (28s → 48s; 1:04s → 1:10s; 2:48 → 3:10)
- <http://www.youtube.com/watch?v=7Ix-eywqUOq&NR=1&feature=fvwp>

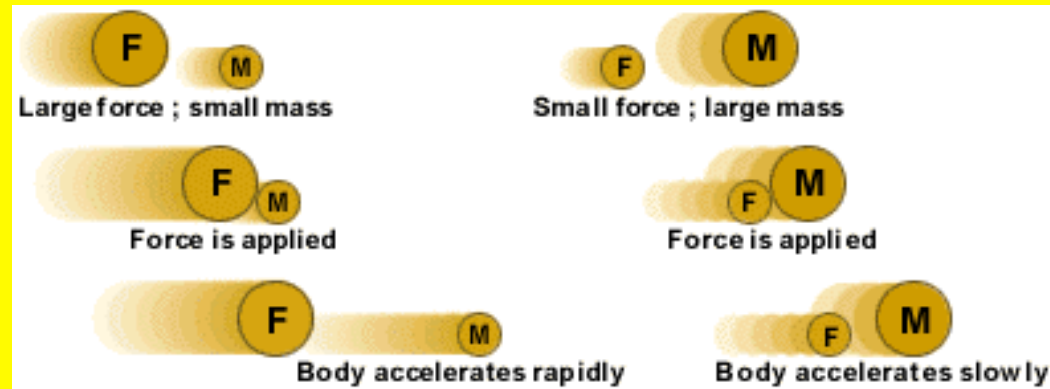


Inertia

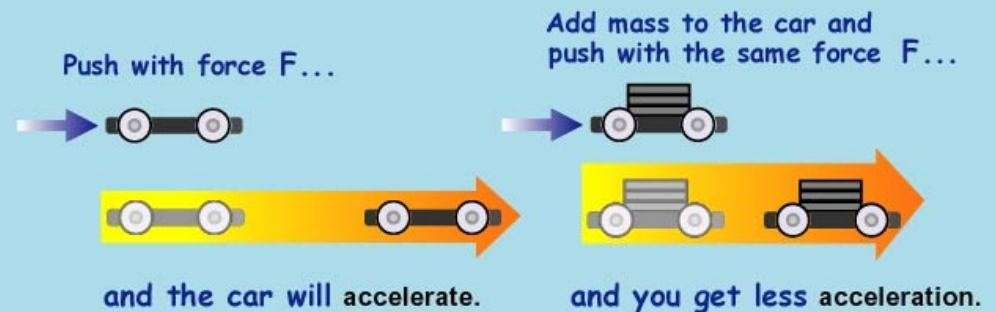
- The tendency of an object to resist a change in motion
- Inertia commonly described as Newton's 1st law
- Depends on the MASS of an object.
- The more mass an object has, the more inertia the object has.
 - [stack of rings](#)
 - [7 examples of inertia](#)

Newton's 2nd law

- The acceleration of an object depends on the mass of the object and the amount of force applied.
- $F = ma$
- <http://www.youtube.com/watch?v=UhCG0qoY9Dc>
- (0 → 18s; 27s → 51s)



Newton's Second Law of Motion



$$\text{Acceleration (m/sec}^2\text{)} \text{ — } a = \frac{F}{m} \text{ — Force (newtons, N) — Mass (kg)}$$

• $F =$

$$\underline{m \times a}$$

• $a =$

$$\frac{F}{M}$$

• $m =$

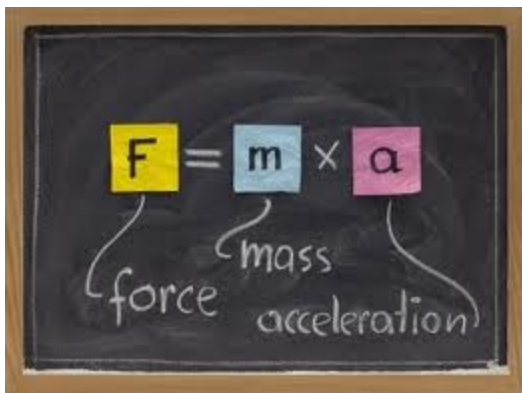
$$\frac{F}{a}$$

*UNITS

Force =

Acceleration =

Mass =





Question 2

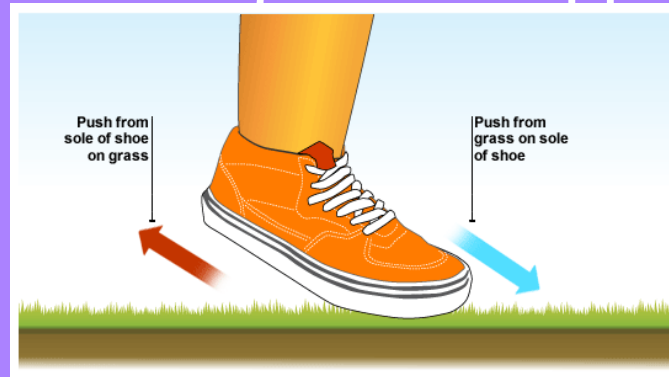
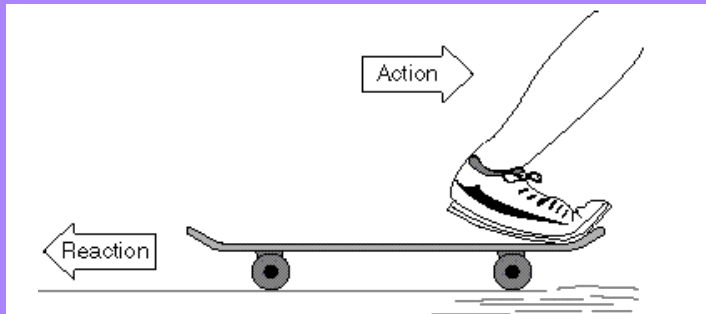
Two forces of 6 N and 3 N act upon an object in opposite directions. What would be the acceleration of this object if it has a mass of 100 kg?

- A) 0.03 m/s^2
- B) 0.09 m/s^2
- C) 0.3 m/s^2
- D) 0.9 m/s^2

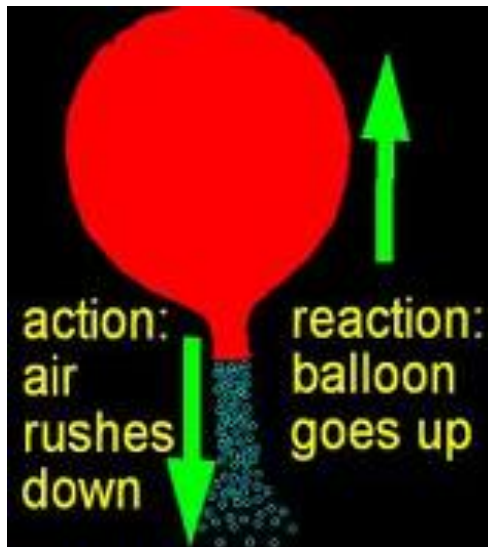
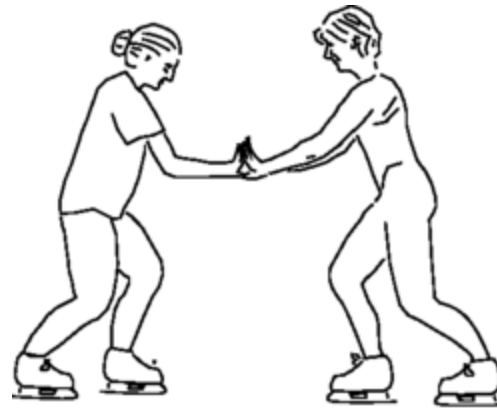
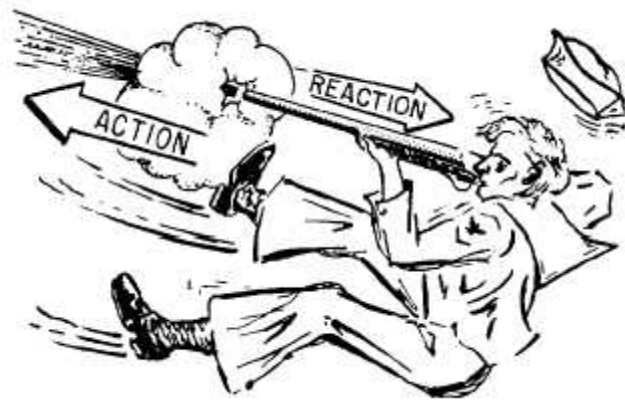


Newton's 3rd Law

- Whenever one object exerts a force on a second object, the second object exerts an equal and opposite force on the first.
- For every action, there is an equal and opposite reaction



- Example - walking, skateboarding
- <http://www.youtube.com/watch?v=Xx9kiF00rts>
- (3:41 → 4:00s)



[http://www.youtube.com/watch?
v=cWOv7NyOnhY&list=PL3E788EDA79
4CCE7B&index=7&feature=plpp_video](http://www.youtube.com/watch?v=cWOv7NyOnhY&list=PL3E788EDA794CCE7B&index=7&feature=plpp_video)