

Newton's Third Law

November-22-16 2:13 PM

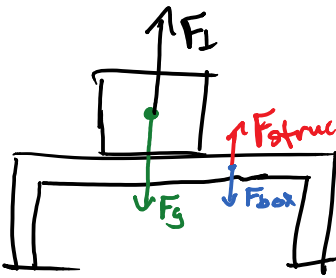
Every action force has an equal and opposite reaction force.

Example:

Shove the person next to you



In pushing that person they passively pushed back through your hands.

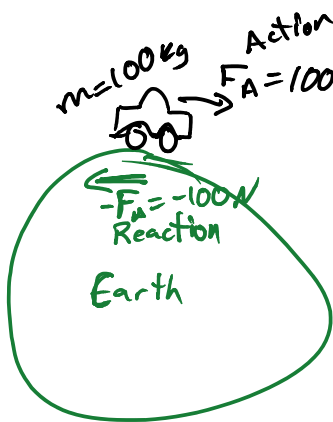


The Force of gravity pulls down on the box) action

↳ The box pushes down on the table.

↳ The structure of the table has to push up to balance the box force

↳ The table then pushes back on this box which is the F_{\perp} Reaction



• The car pushes on the Earth and drives clockwise (according to this picture)

• The Earth is pushed back, rotating counter-clockwise.

$$F_{car} = m_{car} \times a_{car}$$

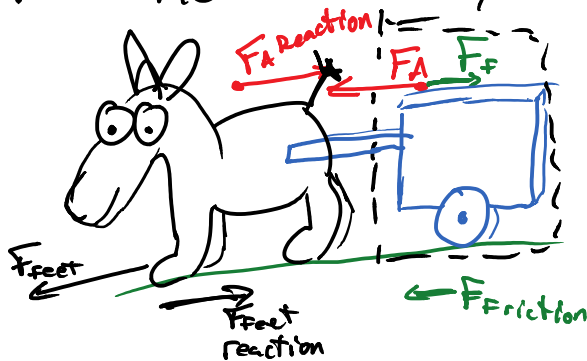
$$100 = 100 a_{car} \Rightarrow a_{car} = 1 \text{ m/s}^2$$

$$F_{earth} = m_{earth} \times a_{earth}$$

$$100 = 5 \times 10^{24} \text{ kg} \times a_{earth}$$

$$\approx 2 \times 10^{-22} \text{ m/s}^2$$

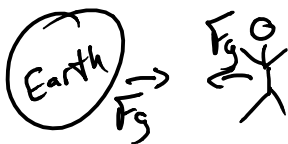
A smart ass is hooked up to a cart. The donkey says "According to Newton's Third Law every force I exert will have an equal and opposite reaction force. So this means we should get balanced forces and no acceleration, so I shouldn't even try to pull the cart." How could you respond?



When we are determining the motion of an object we look at the forces on the one object. And reaction forces can act on other objects.

Defend this statement

The Earth weighs exactly as much you do.
 Force of gravity



While the Earth pulls on you with a force, you pull on the Earth with an equal and opposite force.