

# Newton's 3rd Law

## Newton's 3rd Law

### Objective:

State Newton's 3rd Law.

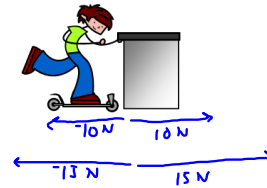
Identify pairs of equal & opposite forces.

Calculate the resulting accelerations when equal & opposite forces are applied to objects with different masses.



## Newton's 3rd Law

for every action force, there is an equal and opposite reaction force

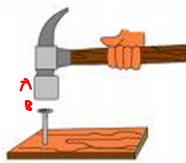


## Force - Interaction

Force occurs in PAIRS

$$F_A \text{ due to B} = -F_B \text{ due to A}$$

$$F_{AB} = -F_{BA}$$



## Action - Reactions



$$a = \frac{F}{m} = \frac{15\text{N}}{50\text{kg}} = \boxed{.3 \frac{\text{m}}{\text{s}^2}}$$

$$a = \frac{F}{m} = \frac{15\text{N}}{100\text{kg}} = \boxed{.15 \frac{\text{m}}{\text{s}^2}}$$

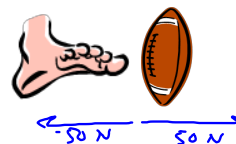
## Action - Reactions

Force amount is always equal  
accelerations are not equal

$$F = ma$$



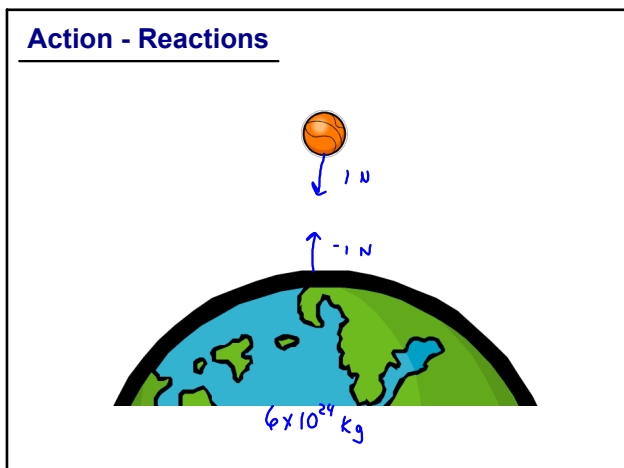
## Action - Reactions



$$a = \frac{F}{m} = \frac{50\text{N}}{50\text{kg}} = \boxed{1 \frac{\text{m}}{\text{s}^2}}$$

$$\frac{50\text{N}}{1\text{kg}} = \boxed{50 \frac{\text{m}}{\text{s}^2}}$$

## Newton's 3rd Law



## Assignments . . .



- Begin Chapter 5 Homework # 1 - 10

