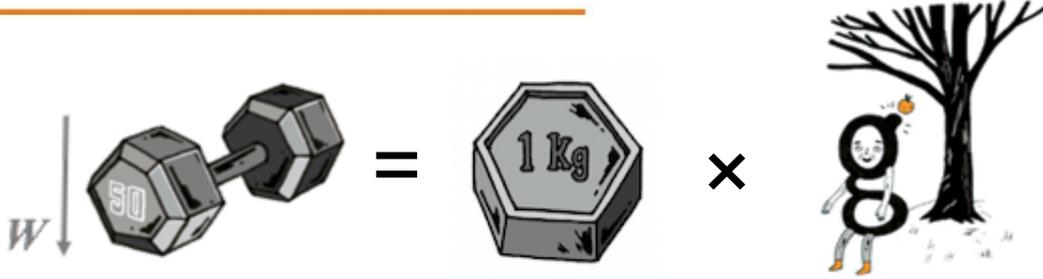


# weight





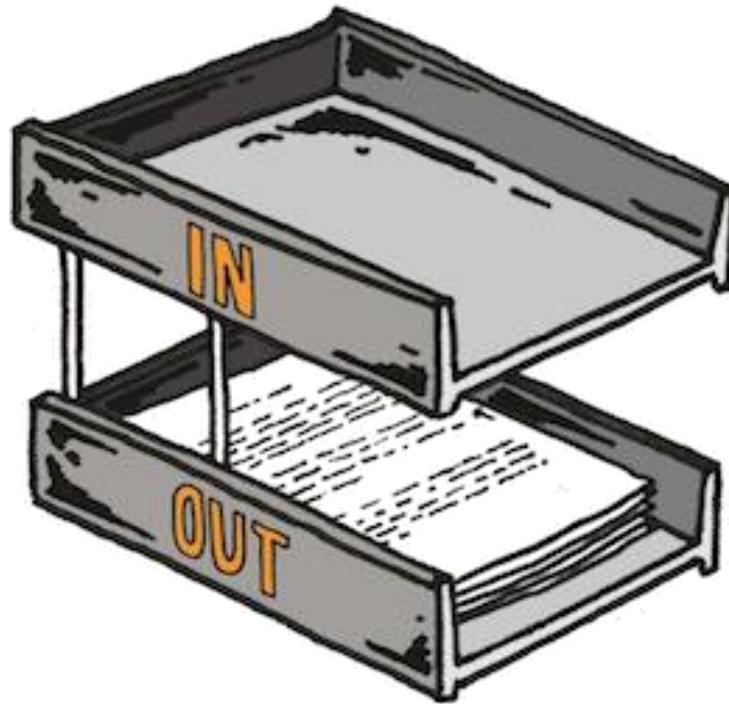
$$\text{weight} = \text{mass} \times \text{gravitational field strength}$$

$$W = m \times g$$

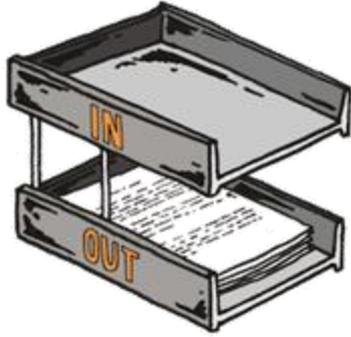
**N**                      kg                      N/kg

Don't forget the SI units

# work done



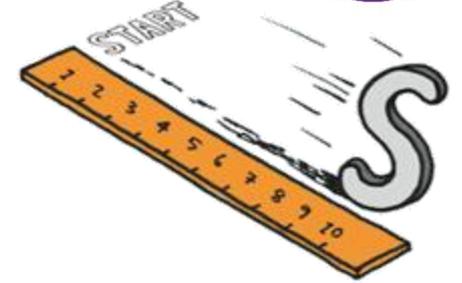
# Knowledge!



=



×

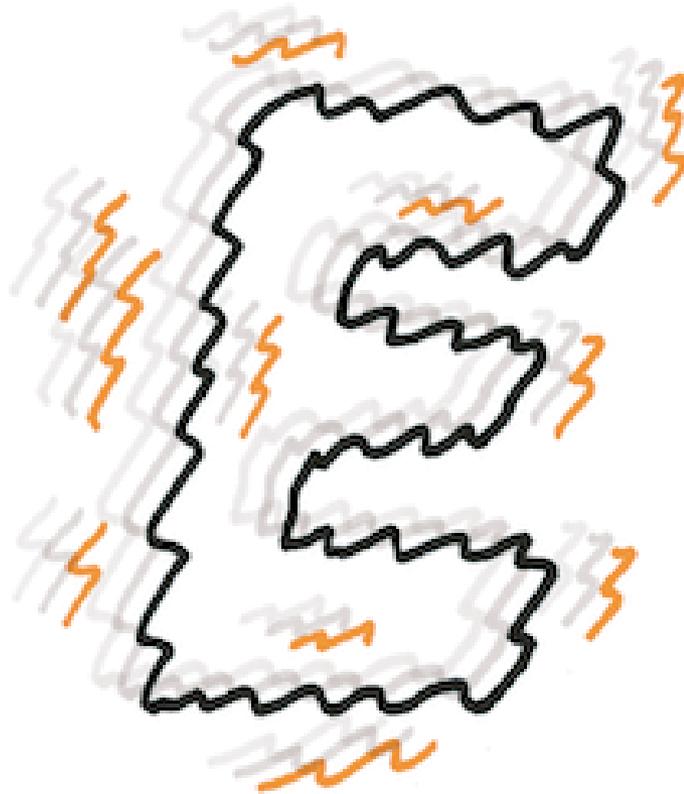


$$\text{work done} = \text{force} \times \text{distance}$$

$$\begin{array}{ccccc} \downarrow & & \downarrow & & \downarrow \\ \mathbf{W} & = & \mathbf{F} & \times & \mathbf{s} \\ \downarrow & & \downarrow & & \downarrow \\ \mathbf{J} & & \mathbf{N} & & \mathbf{m} \end{array}$$

Don't forget the SI units

# kinetic energy





# gravitational potential energy



# Knowledge!



=



×



×



gravitational  
potential  
energy

=

mass

×

gravitational field  
strength (g)

×

height



$E_p$

=

$m$

×

$g$

×

$h$

Don't  
forget  
the SI  
units



J



kg



N/kg



m

# power



ENERGY TRANSFERRED

# Knowledge!



J  
↑  
**E**  
↑

$$\text{power} = \frac{\text{energy transferred}}{\text{time}}$$



**P**



**W**

time



**t**



**s**

$$P = \frac{E}{t}$$

Don't forget the SI units



# power



WORK DONE

# Knowledge!



J  
↑  
**W**  
↑

$$\text{power} = \frac{\text{work done}}{\text{time}}$$

time

↓  
**P**  
↓  
**W**

$$P = \frac{W}{t}$$

↓  
**t**  
↓  
**s**

Don't forget the SI units

# efficiency



**POWER**



$$\text{efficiency} = \frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$$

J  
↑

↓  
J

Don't forget the SI units

# efficiency



POWER



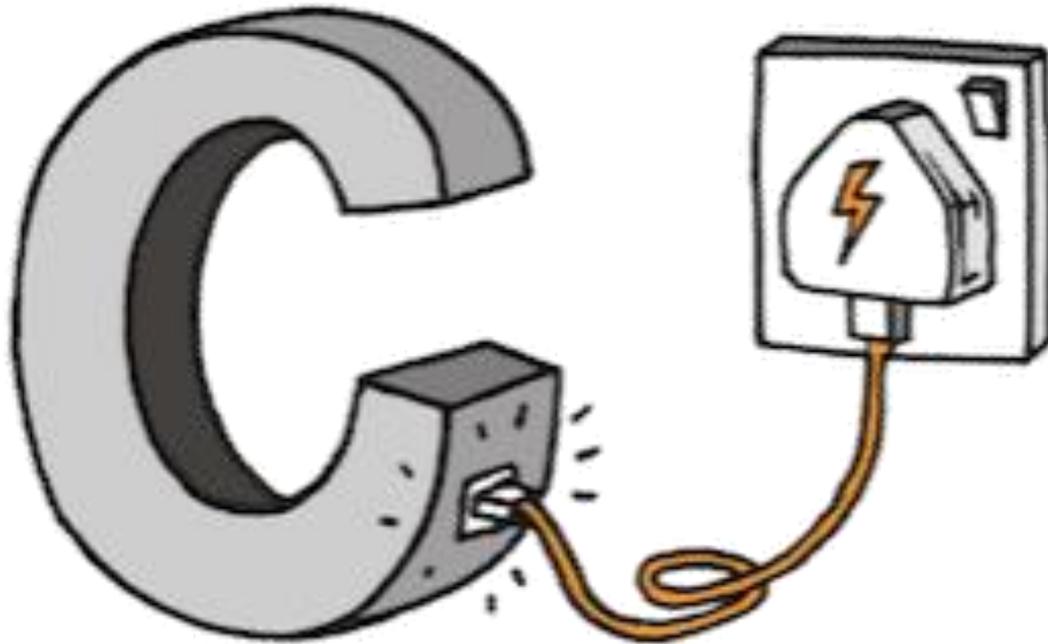
$$\text{efficiency} = \frac{\text{useful power output}}{\text{total power input}}$$

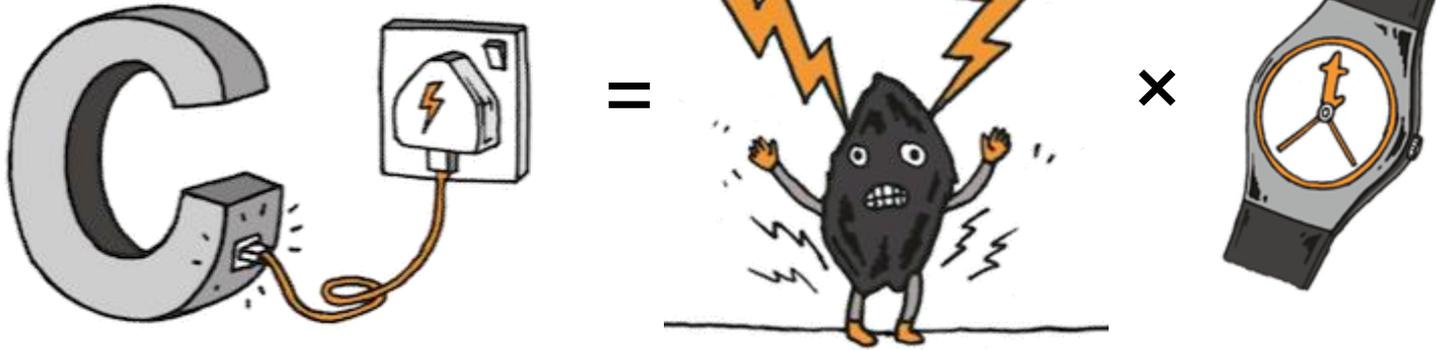
J  
↑

↓  
J

Don't forget the SI units

# charge flow





charge flow = current × time

↓ ↓ ↓

$$Q = I \times t$$

↓ ↓ ↓

C A S

Don't forget the SI units

# potential difference



# Knowledge!



×



$$\text{potential difference} = \text{current} \times \text{resistance}$$



***V***



***I***

×



***R***



**V**



**A**



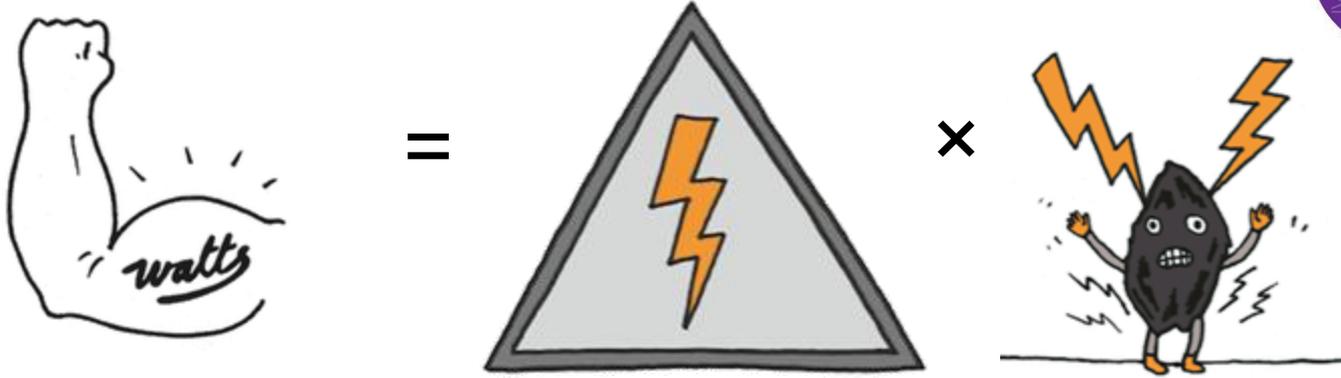
**Ω**

Don't forget the SI units

# power



POTENTIAL DIFFERENCE



$$\boxed{\text{power}} = \boxed{\text{potential difference}} \times \boxed{\text{current}}$$

$$\begin{array}{ccc} \downarrow & & \downarrow \\ \mathbf{P} & = & \mathbf{V} \times \mathbf{I} \\ \downarrow & & \downarrow \\ \mathbf{W} & & \mathbf{V} \quad \mathbf{A} \end{array}$$

Don't forget the SI units

# power



CURRENT



$$\text{power} = (\text{current})^2 \times \text{resistance}$$

$$P = I^2 \times R$$

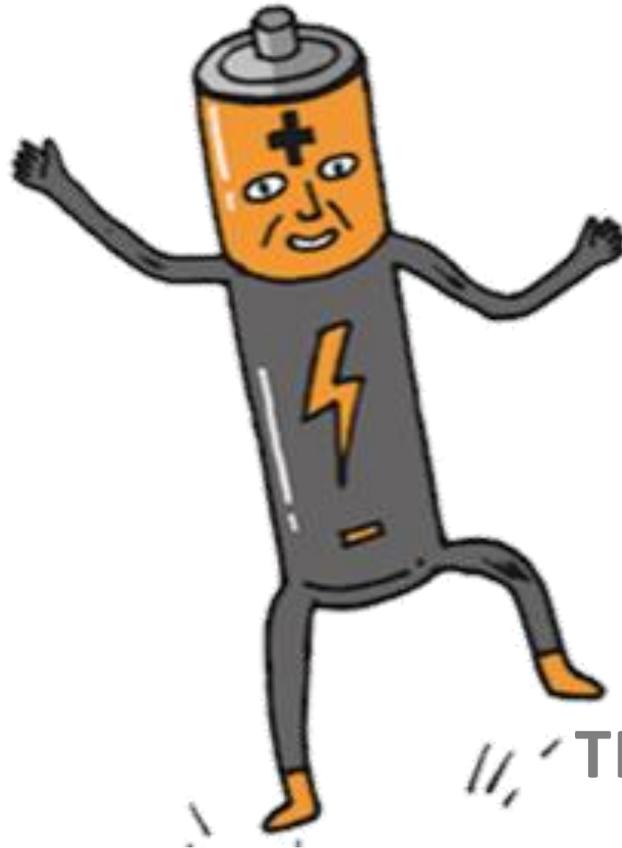
↓  
**W**

↓  
**A**

↓  
**Ω**

Don't forget the SI units

# energy transferred



TRANSFERRED  
POWER



$$\boxed{\text{energy transferred}} = \boxed{\text{power}} \times \boxed{\text{time}}$$

$$\begin{array}{ccc} \downarrow & & \downarrow \\ \mathbf{E} & = & \mathbf{P} \times \mathbf{t} \end{array}$$

Don't forget the SI units

$$\begin{array}{ccc} \downarrow & & \downarrow \\ \mathbf{J} & & \mathbf{W} \times \mathbf{S} \end{array}$$

# energy transferred

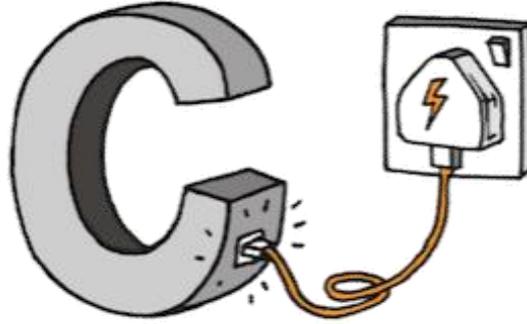


TRANSFERRED  
CHARGE FLOW

# Knowledge!



=



×

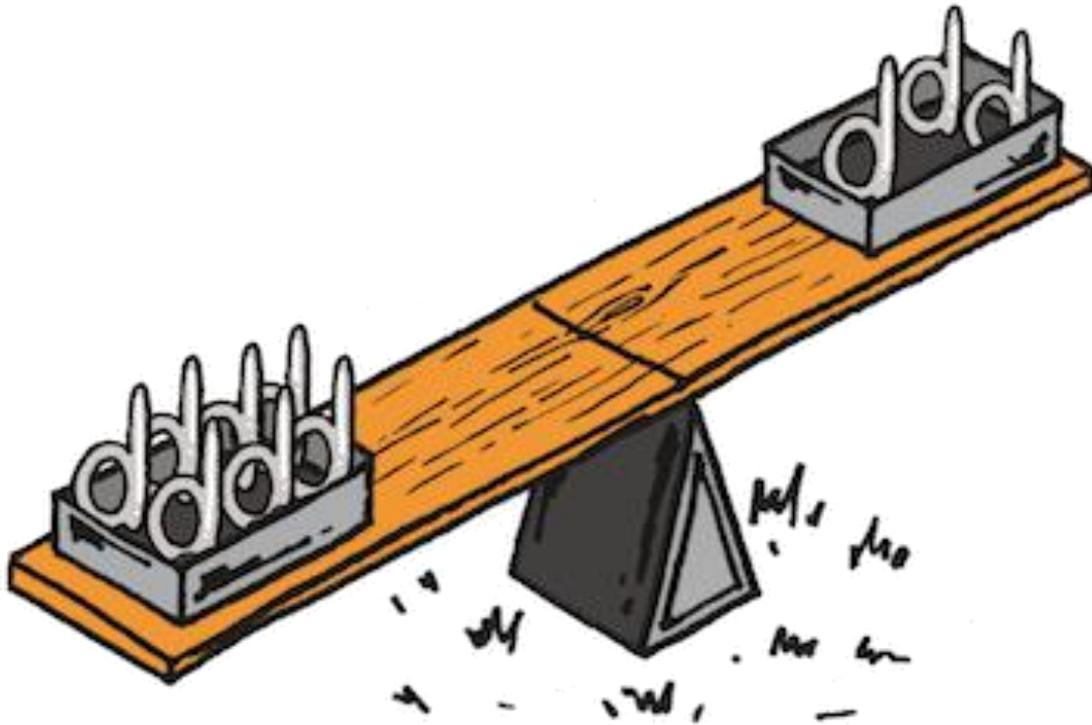


energy transferred = charge flow × potential difference

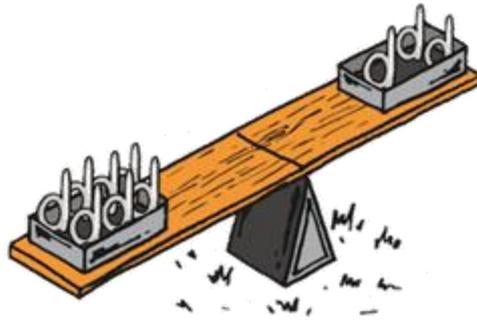
$$\begin{array}{ccccc} \downarrow & & \downarrow & & \downarrow \\ \mathbf{E} & = & \mathbf{Q} & \times & \mathbf{V} \\ \downarrow & & \downarrow & & \downarrow \\ \mathbf{J} & & \mathbf{C} & & \mathbf{V} \end{array}$$

Don't forget the SI units

# density



# Knowledge!



kg

$m$

density

= mass

volume

$\rho$

$\text{Kg}/\text{m}^3$

$$\rho = \frac{m}{V}$$

$V$

$\text{m}^3$

Don't forget the SI units

# force applied to a spring





=



×



force applied to a spring = spring constant × extension

$F$

=

$k$

×

$e$



**N**



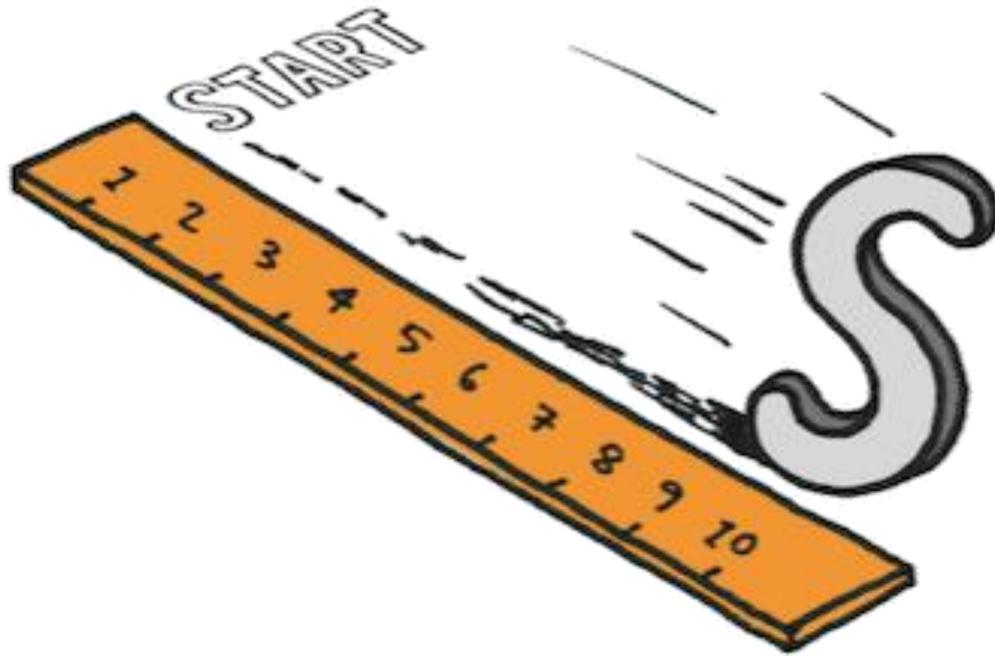
**N/m**



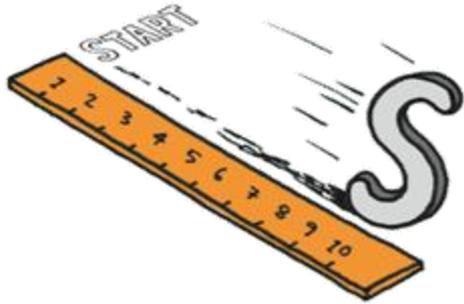
**m**

Don't forget the SI units

# distance travelled



# Knowledge!



=



×



$$\text{distance travelled} = \text{speed} \times \text{time}$$



***s***

=



***v***

×



***t***

Don't forget  
the SI units



**m**



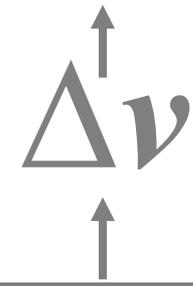
**m/s**



**s**

**acceleration**





**acceleration** =  $\frac{\text{change in velocity}}{\text{time taken}}$

$a$   
↓  
 $m/s^2$

$$a = \frac{\Delta v}{t}$$

$t$   
↓  
 $s$

Don't forget the SI units

Remember!  $\Delta$  means change in

# resultant force



# Knowledge!



=



×



$$\text{resultant force} = \text{mass} \times \text{acceleration}$$



$$F = m \times a$$



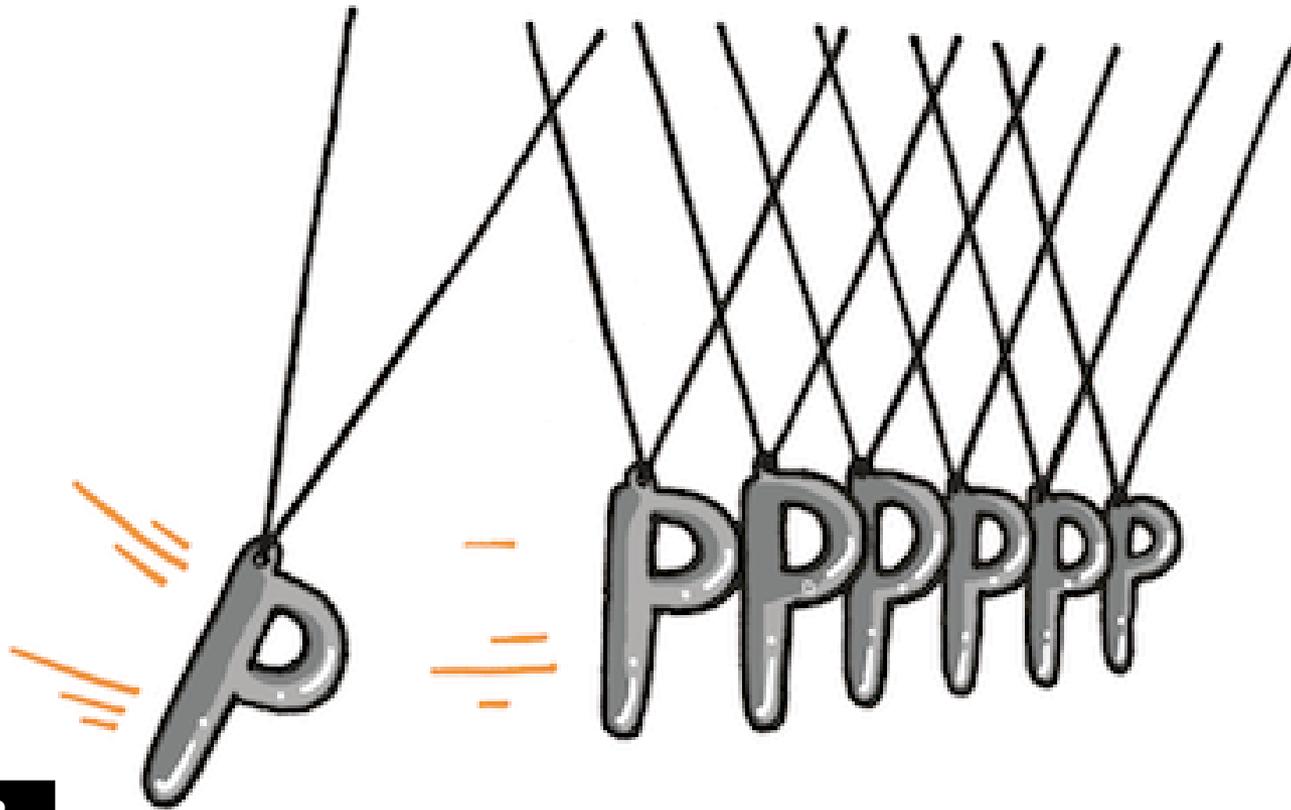
N

kg

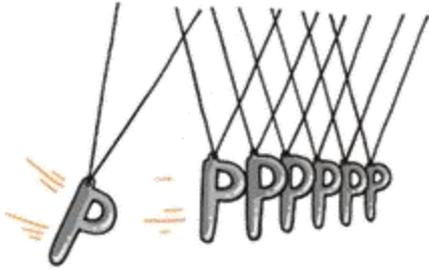
m/s<sup>2</sup>

Don't forget the SI units

# momentum



HIGHER  
TIER ONLY



=



×



momentum

=

mass

×

velocity



*p*

=

*m*

×

*v*



kgm/s



kg



m/s

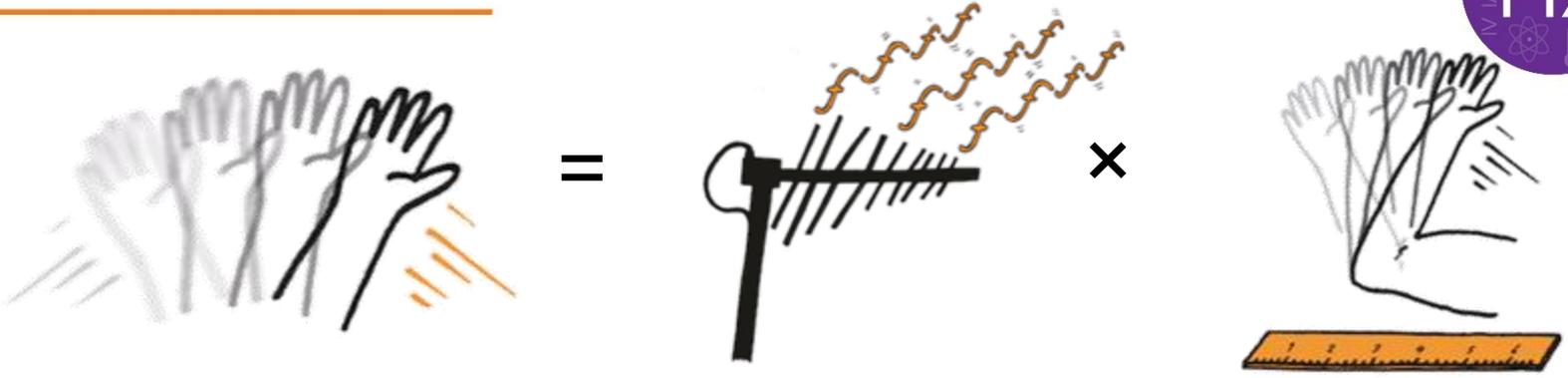
HIGHER  
TIER ONLY

Don't forget  
the SI units

# wave speed



# Knowledge!



$$\text{wave speed} = \text{frequency} \times \text{wavelength}$$

$$v = f \times \lambda$$

$v$  is in **m/s**  
 $f$  is in **Hz**  
 $\lambda$  is in **m**

Don't forget the SI units