



Who transfers the most energy and why?



But which is the most powerful? Mo or the truck if they both travel 10 km?

# To summarise...

- Mo transfers more energy than Usain because he travels **further** and **for longer** compared to the size of the **force** needed.
- The truck transfers more energy as it needs a much **bigger force** to push it.
- The truck is more powerful as it transfers **more energy** and does it **quicker**.

# Work and Power

I

Identify the units for work and power

D

Describe the meaning of work and power

E

A

Apply the work done and power equations discretely

L

Link equations to combined questions



...inspiring success




Churchdown  
School Academy

# Work done



Work is done whenever a force is used to make something move.

- Doing work requires energy or is a transfer of energy
- As you do this work, energy is transferred.



**Work done = Energy Transferred**



# Work done

Work done = Force x distance (in direction of force)

$$W = F \times s$$

## Units

Work done - Joules (J)

Force - Newtons (N)

Distance - metres (m)

**REMEMBER -  
Weight is a  
force**

A

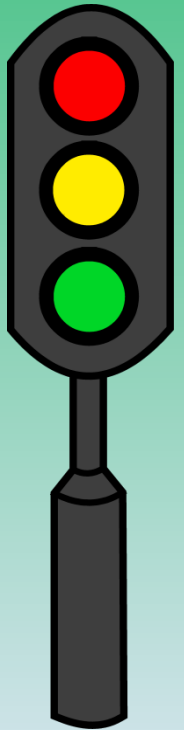
We do:

- **Example 1:** A builder pushes a wheel barrow a distance of 5.0 m across a flat ground with a force of 50 N. How much work does he do?

A

You do:

- **Example 2:** Paula lifts a laptop 2m into the air with a force of 10N. How much work does she do?







# Power

- Power is the rate of work being done or the rate of energy transferred. [rate of means how quickly]
- It is measured in watts where 1 W is 1 J/s

$$\bullet \text{ Power (W)} = \frac{\text{Work done (J)}}{\text{time taken (s)}}$$

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

A

We do:

- **Example 1:** Barry does 300 J of work lifting his school bag in 2 s. What power did he have?



A

L

# You do

- Check you are happy by doing a standard question
- Then move to the challenge and super challenge Qs when you are confident.

## Core

1. 75J

2. 60W

3. 160J

4. 14300J

## Challenge

5. 175m

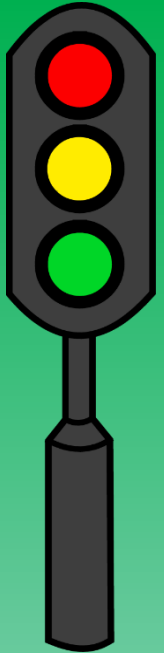
6. 20W

7. 0.83W

8. 3kN



# Identify the units for...



Work done

- A. Watts    B. Kilograms    C. Joules

Power

- A. Watts    B. Kilograms    C. Joules

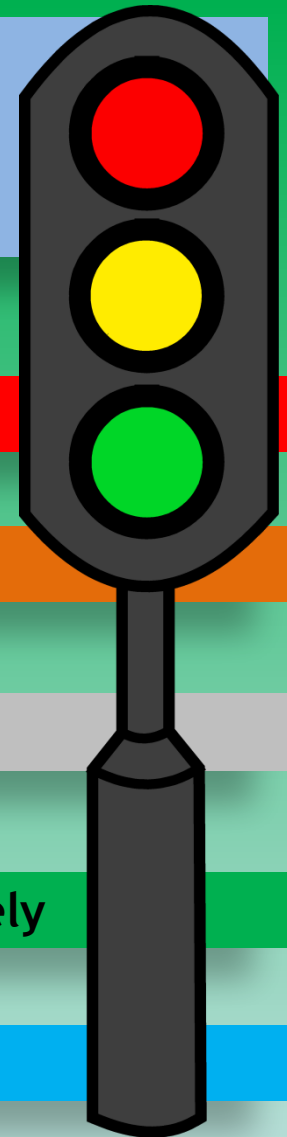
Weight

- A. Kilograms    B. Newtons    C. Watts

Time

- A. Minutes                      B. Seconds  
C. Hours

# Work and Power



I

Identify the units for work and power

D

Describe the meaning of work and power

E

A

Apply the work done and power equations discretely

L

Link equations to combined questions



...inspiring success



Churchdown  
School Academy