

# OCR A Physics GCSE

## 7.2 - Power and Efficiency

### Flashcards



# What is the definition of 'Power'?



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The rate at which energy is transferred  
(or rate at which work is done).



State **two** equations for power. Give SI units for all quantities involved.



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

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

Energy (J), Work Done (J), Time (s)



What is the unit of power?



# What is the unit of power?

Watt (W)



What is one Watt equivalent to?



# What is one Watt equivalent to?

An energy transfer of 1 joule per second.

$$1 \text{ W} = 1 \text{ J/s}$$



Two motors lift the same mass through the same height. Motor A does this in half the time of Motor B. Which dissipates the most power?



Two motors lift the same mass through the same height. Motor A does this in half the time of Motor B.  
Which dissipates the most power?

Motor A.

The energy transferred is the same but the time taken is less ( $P=E/t$ ).



# What is efficiency?



## What is efficiency?

The ratio of useful work done to energy supplied. It is often given as a percentage, i.e. the percentage of energy which is converted to a useful form.



Give the equation for efficiency.



Give the equation for efficiency.

$$\text{Efficiency} = \frac{\text{Useful energy output}}{\text{Total energy input}}$$

You can convert this to a percentage by multiplying the answer by 100.



How can the efficiency of a system be increased? (Higher)



How can the efficiency of a system be increased?  
(Higher)

1. **Reducing** waste output (by lubrication, thermal insulation etc.)
2. **Recycling** waste output (eg. recycling thermal waste energy as input energy).



State the consequence for energy transfer of a material with a high thermal conductivity.



State the consequence for energy transfer of a material with a high thermal conductivity.

The rate of energy transfer through the material is higher than for a material with a lower thermal conductivity.



Do double-glazed windows have a higher or lower thermal conductivity than single-glazed windows?



Do double-glazed windows have a higher or lower thermal conductivity than single-glazed windows?

Lower, meaning less energy transfers through them.



State **three** methods of reducing heat loss in a building.



State **three** methods of reducing heat loss in a building.

1. Double glazing
2. Loft and wall insulation
3. Thicker walls



Describe the useful and waste energy for a kettle.



Describe the useful and waste energy for a kettle.

- Useful: Heating the water.
- Waste: Sound energy and infrared radiation into the surroundings.



Describe the useful and waste energy for a hair dryer.



Describe the useful and waste energy for a hair dryer.

- Useful: Heating the air and turning the motor to blow the air.
- Waste: Sound energy, heating the motor and releasing infrared radiation into surroundings.

