

# AQA Physics GCSE

## 4.2.4 - Energy Transfers

### Flashcards



State two equations for the power of a circuit. Give appropriate units.



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$$P = IV$$

$$P = I^2 R$$

Power (Watts), Current (Amperes)  
Potential Difference (Volts), Resistance  
(Ohms)



State an equation linking energy transferred, power and time. Give appropriate units.



State an equation linking energy transferred, power and time. Give appropriate units.

$$E = P t$$

Energy (Joules), Power (Watts), Time  
(Seconds)



State an equation linking energy transferred, charge flow and potential difference. Give appropriate units.



State an equation linking energy transferred, power and time. Give appropriate units.

$$E = Q V$$

Energy (Joules), Charge (Coulombs),  
Potential Difference (Volts)



What two main factors does the amount of energy transferred by an appliance depend on?





What two main factors does the amount of energy transferred by an appliance depend on?

1. How long the appliance is being used for
2. The power of the appliance



Describe the energy transfers in a battery powered torch.



Describe the energy transfers in a battery powered torch.

- Battery converts chemical energy into electrical energy
- Bulb converts electrical energy into light as well as waste energy in the form of heating



Describe the energy transfers in a battery powered motor.



Describe the energy transfers in a battery powered motor.

- Battery converts chemical energy into electrical energy
- Motor converts electrical energy into kinetic energy as well as waste energy in the form of heating due to friction



What three things determine the power of a circuit device?



What three things determine the power of a circuit device?

1. The potential difference across the circuit
2. The current through the circuit
3. The amount of energy transferred in a given time



# What is the purpose of the National Grid?





What is the purpose of the National Grid?

To link power stations to consumers so that they have access to a source of electricity.



What are the two types of transformers used in the National Grid?



What are the two types of transformers used in the National Grid?

1. Step-Up Transformers
2. Step-Down Transformers



Where are step-up transformers found in the National Grid? What do they do?



Where are step-up transformers found in the National Grid? What do they do?

- Step-Up Transformers are used when connecting power stations to transmission cables
- They increase the potential difference



Where are step-down transformers found in the National Grid? What do they do?



Where are step-down transformers found in the National Grid? What do they do?

- Step-Down Transformers are used in connecting transmission cables to domestic buildings (like houses)
- They decrease the potential difference



# Why do transmission lines transfer electricity at high potentials?





## Why do transmission lines transfer electricity at high potentials?

- A high potential, results in a low current
- The lower the current, the less energy that is wasted as heat
  - Therefore it is more efficient



Why does the potential need to be decreased between transmission lines and houses?



Why does the potential need to be decreased between transmission lines and houses?

- Lower potentials are safer for domestic use and reduces the likelihood of severe electrocution
- Appliances are designed for 230V

