

# OCR (B) Physics GCSE

Topic 3.7 - What is the process inside an electric generator?

(Physics only)

Flashcards

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# How is mains electricity produced?



# How is mains electricity produced?

## Using electromagnetic induction.



# What is electromagnetic induction?



# What is electromagnetic induction?

The production of a potential difference when there is relative movement between a conductor and a magnetic field.



In what direction is the potential difference induced?



In what direction is the potential difference induced?

In the opposite direction to the movement which produced it.



# When is a current produced?





When is a current produced?

When the ends of the coil are connected to a complete circuit.



# How are electrical generators set up? (Higher)



How are electric generators set up? (Higher)

In the same way as a motor, with a rectangular loop of wire between permanent magnets. The main difference is the presence of a turbine to spin the coil.



# Describe how an electrical generator works (Higher)



## Describe how an electrical generator works (Higher)

- A turbine spins the coil of wire between the magnets.
- The wire cuts through the magnetic field, experiencing a changing magnetic field.
- A potential difference is induced.
- A current is produced.



What kind of current is produced by an ordinary generator? (Higher)



What kind of current is produced by an ordinary generator? (Higher)

An alternating current.



How can a direct current be produced?  
(Higher)





How can a direct current be produced? (Higher)

Using a split ring commutator; this disconnects and reconnects the wires every half rotation, switching the current so the motor spins continuously.



# What is a dynamo? (Higher)



What is a dynamo? (Higher)

A system which produces direct current by continuously spinning a coil in a permanent magnetic field.



# How do transformers work? (Higher)



## How do transformers work? (Higher)

- An alternating current flows through the primary coil, producing an alternating magnetic field.
- This causes the secondary coil to experience a changing magnetic field, inducing a potential difference, which produces an alternating current in the secondary coil.



Why do step up transformers increase voltage? (Higher)



Why do step up transformers increase voltage?  
(Higher)

There are more coils experiencing the change, so a larger p.d. is induced.



State one assumption used in transformer calculations (Higher)





State one assumption used in transformer calculations (**Higher**)

The transformer is 100% efficient (the power is assumed to be the same in both coils).



Give the transformer equations linking number of coils, p.d. and current (**Higher**)



Give the transformer equations linking the number of coils, p.d. and current (**Higher**)

$$\frac{N_1}{N_2} = \frac{V_1}{V_2} = \frac{I_2}{I_1}$$



# How do microphones work? (Higher)



## How do microphones work? (Higher)

- A current is produced which is proportional to the signal strength of the sound.
- There is a fixed magnet in the centre, with the coil around it free to move.
- Pressure variations from the sound waves cause the coil to move, cutting the magnetic field lines and inducing a p.d. and therefore a current.
- The current is transmitted to a loudspeaker.

