

WJEC (Eduqas) Physics GCSE

8.4: Microphones and Speakers

Detailed Notes

(Content in **bold** is for higher tier **only**)

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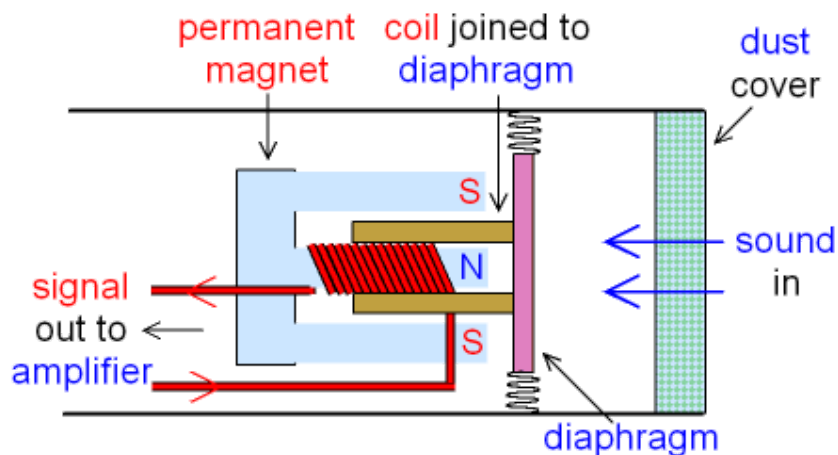




Dynamic Microphones

A microphone takes the input **sound vibrations** and produces a **current** which is proportional to the sound signal. A **fixed magnet** is at the centre, and the coil of wire around the magnet is **free to move**.

The **pressure** variations in the sound waves cause this **coil to move within the magnetic field**. As it moves, **current is induced** in the coil as it cuts the magnetic field. This induced current can then be transmitted to loudspeakers, amplifiers or a computer system for recording.



Internal components of a dynamic microphone (gcsescience.com).

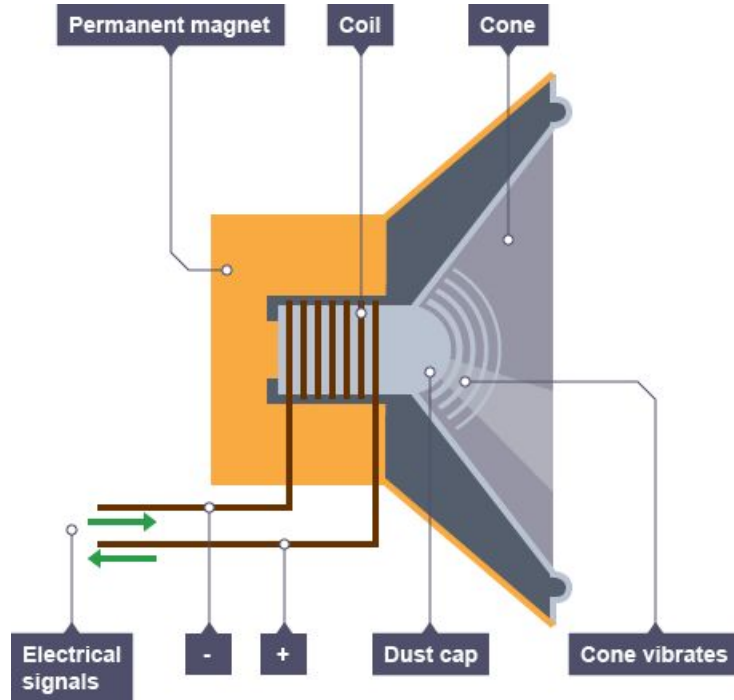
Electric Loudspeakers

These work in the opposite way to a dynamic microphone, taking an electrical signal and transforming it into sound wave vibrations of the air.

A loudspeaker contains a **coil of wire** and **permanent magnets**. This coil moves towards the permanent magnet when the speaker is switched on, as current flows through the coil an **electromagnetic field** is created around it.

This movement also **draws in the cone** of the speaker, creating **vibrations** which are then transmitted through the air as **sound waves**.





Internal components of a dynamic loudspeaker (bbc.co.uk).

