Electricity and magnetism

IGCSE Physics · Vocabulary in context

Word	Example
magnet /ˈmægnɪt/	The **magnet** attracts an iron nail.
poles /pəʊlz/	A magnet has two **poles**: north and south.
north pole /nɔːθ pəʊl/	Field lines leave a magnet at its **north pole**.
south pole /saʊθ pəʊl/	Field lines enter a magnet at its **south pole**.
repel /rɪˈpel/	Two positive charges **repel** each other.
repulsion /rɪˈpʌlʃn/	Two north poles show **repulsion**.
attract /əˈtrækt/	A positive and a negative charge **attract** each other.
attraction /əˈtrækʃn/	A north and a south pole show **attraction**.
magnetic material /mægˈnetɪk məˈtɪərɪəl/	Iron is a **magnetic material**.
induced magnetism /ɪnˈdjuːst ˈmægnɪtɪzəm/	A magnet makes a nail magnetic by **induced magnetism**.
soft iron /sɒft ˈaɪən/	**Soft iron** is easy to magnetise and loses its magnetism quickly.
magnetise /ˈmægnɪtaɪz/	Stroke a needle with a magnet to **magnetise** it.
temporary magnet /ˈtemprəri ˈmægnɪt/	A soft iron nail is a **temporary magnet**.

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Word	Example
steel /stiːl/	**Steel** is stronger than iron.
permanent magnet /ˈpɜːmənənt ˈmægnɪt/	A fridge magnet is a **permanent magnet**.
unmagnetised /ʌnˈmægnɪtaɪzd/	An **unmagnetised** iron bar has no poles.
magnetic field /mægˈnetɪk fiːld/	A magnet has a **magnetic field** around it.
region /ˈriːdʒn/	The inequality $y > x^2$ describes a **region** above the curve. $y > x^2$
magnetic field lines /mægˈnetɪk fiːld laɪnz/	**Magnetic field lines** go from north to south.
iron filings /ˈaɪən ˈfaɪlɪŋz/	**Iron filings** show the field around a magnet.
compass /ˈkʌmpəs/	A **compass** shows sailors which way is north.
electromagnet /ɪˌlektrəʊˈmægnɪt/	An **electromagnet** picks up scrap iron.
electric charge /ɪˈlektrɪk tʃɑːdʒ/	A rubbed balloon has an **electric charge**.
positive charge /ˈpɒzɪtɪv tʃɑːdʒ/	A proton carries a **positive charge**.
negative charge /ˈnegətɪv tʃɑːdʒ/	An electron carries a **negative charge**.
electron /ɪˈlektrɒn/	An **electron** has a negative charge.
charging by friction /ˈtʃɑːdʒɪŋ baɪ ˈfrɪkʃn/	**Charging by friction** happens when you rub a balloon on your hair.
conductor /kənˈdʌktə/	Copper is a good **conductor** of electricity.

Word	Example
insulator /ˈɪnsjuːleɪtə/	Plastic is an **insulator**.
coulomb /ˈkuːlɒm/	The **coulomb** is the unit of charge.
electric field /ɪˈlektrɪk fiːld/	A charged ball has an **electric field** around it.
point charge /pɔɪnt tʃɑːdʒ/	Treat the small ball as a **point charge**.
ion /ˈaɪɒn/	An **ion** is an atom that has gained or lost electrons.
electric current /ɪˈlektrɪk ˈkʌrənt/	An **electric current** flows when the switch is closed.
ampere /ˈæmpeə/	The **ampere** is the unit of electric current.
ammeter /ˈæmiːtə/	Connect the **ammeter** in series.
analogue /ˈænəlɒg/	An **analogue** signal changes smoothly.
digital /ˈdɪdʒɪtl/	A **digital** signal uses only 0 and 1. 0 1
ranges /ˈreɪndʒɪz/	Choose meter **ranges** large enough for your readings.
free electrons /friː ɪˈlektrɒnz/	**Free electrons** carry current in a metal wire.
conventional current /kənˈvenʃənl ˈkʌrənt/	**Conventional current** flows from + to −. + −
direct current /daɪˈrekt ˈkʌrənt/	A battery gives **direct current**.
alternating current /ˈɔːltəneɪtɪŋ ˈkʌrənt/	The mains gives **alternating current**.

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Word	Example
mains supply /meɪnz səˈplaɪ/	The **mains supply** in China is 220 V. 220 V
energy /ˈenədʒi/	Food gives your body the **energy** it needs to move.
volt /vəʊlt/	The **volt** is the unit of potential difference.
electromotive force /ɪˌlektrəʊˈməʊtɪv fɔːs/	The battery has an **electromotive force** of 9 V. 9 V
circuit /ˈsɜːkɪt/	A closed **circuit** lets steady current flow through the lamp.
potential difference /pəˈtenʃl ˈdɪfrəns/	The **potential difference** across the lamp is 6 V. 6 V
voltmeter /ˈvəʊltmiːtə/	Connect the **voltmeter** across the lamp.
resistance /rɪˈzɪstəns/	A thin wire has a high **resistance**.
ohm /əʊm/	The **ohm** is the unit of resistance.
variable resistor /ˈveərɪəbl rɪˈzɪstə/	A **variable resistor** changes the current in a circuit.
directly proportional /daɪˈrektli prəˈpɔːʃənl/	Current is **directly proportional** to voltage for a resistor.
inversely proportional /ɪnˈvɜːsli prəˈpɔːʃənl/	Pressure is **inversely proportional** to volume.
cross-sectional area /krɒs ˈsekʃənl ˈeərɪə/	A thick wire has a large **cross-sectional area**.
resistor /rɪˈzɪstə/	The **resistor** limits the current.

Word	Example
filament lamp /ˈfɪləmənt læmp/	A **filament lamp** gets hot when it lights up.
diode /ˈdaɪəʊd/	The **diode** stops current flowing the wrong way.
electrical power /ɪˈlektrɪkl ˈpaʊə/	**Electrical power** is current times voltage.
watt /wɒt/	One **watt** means one joule every second.
electrical energy /ɪˈlektrɪkl ˈenədʒi/	A battery gives **electrical energy** to the lamp.
joule /dʒuːl/	Lifting an apple by one metre takes about one **joule** of energy.
kilowatt-hour /ˈkɪləwɒt ˈaʊə/	One **kilowatt-hour** is the energy a 1 kW heater uses in one hour. 1 kW
appliance /əˈplaɪəns/	A kettle is an electrical **appliance**.
heater /ˈhiːtə/	The **heater** warms the water.
cell /sel/	One **cell** gives 1.5 V. 1.5 V
battery /ˈbætəri/	A **battery** is two or more cells joined together.
power supply /ˈpaʊə səˈplaɪ/	The **power supply** gives 6 V. 6 V
switch /swɪtʃ/	Press the **switch** to turn on the lamp.
fuse /fjuːz/	The **fuse** melts if the current is too big.
thermistor /ˈθɜːmɪstə/	A **thermistor** measures the temperature.

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Word	Example
light-dependent resistor /laɪt dɪˈpendənt rɪˈzɪstə/	A **light-dependent resistor** has a low resistance in bright light.
light-emitting diode /laɪt ɪˈmɪtɪŋ ˈdaɪəʊd/	A **light-emitting diode** glows when current flows the right way.
relay /ˈriːleɪ/	A **relay** uses a small current to switch a large one.
motor /ˈməʊtə/	An electric **motor** turns the fan.
bell /bel/	An electric **bell** rings when you press the button.
transformer /trænsˈfɔːmə/	A **transformer** changes the voltage.
series /ˈsɪəriːz/	Springs in **series** stretch more than one spring.
parallel /ˈpærəlel/	Two springs side by side, in **parallel**, are stiffer.
total resistance /ˈtəʊtl rɪˈzɪstəns/	Two 5 Ω resistors in series have a **total resistance** of 10 Ω. 5 Ω 10 Ω
junction /ˈdʒʌŋkʃn/	At a **junction**, the current splits.
potential divider /pəˈtenʃl dɪˈvaɪdə/	Two resistors in a **potential divider** share the voltage.
hazard /ˈhæzəd/	Falling masses are a **hazard** to your feet.
insulation /ˌɪnsjuːˈleɪʃn/	Plastic **insulation** covers the copper wire.
overheating /ˌəʊvəˈhiːtɪŋ/	**Overheating** can cause a fire.
damp /dæmp/	Never touch a switch with **damp** hands.

Word	Example
overloading /ˌəʊvəˈləʊdɪŋ/	**Overloading** a socket with too many plugs is dangerous.
socket /ˈsɒkɪt/	Plug the kettle into the **socket**.
live wire /laɪv ˈwaɪə/	The **live wire** carries the high voltage.
neutral wire /ˈnjuːtrəl ˈwaɪə/	The **neutral wire** completes the circuit.
earth wire /ɜːθ ˈwaɪə/	The **earth wire** protects you if the metal case becomes live.
fuse rating /fjuːz ˈreɪtɪŋ/	A kettle needs a 13 A **fuse rating**. 13 A
trip switch /trɪp swɪtʃ/	A **trip switch** cuts the power when there is a fault.
casing /ˈkeɪsɪŋ/	The **casing** of the hair dryer is plastic.
earthed /ɜːθt/	The metal case is **earthed** for safety.
double-insulated /ˈdʌbl ˈɪnsjuːleɪtɪd/	A **double-insulated** appliance needs no earth wire.
solenoid /ˈsəʊlənɔɪd/	A **solenoid** is a long coil of wire.
coil /kɔɪl/	Wrap the wire into a **coil**.
loudspeaker /ˈlaʊdspiːkə/	A **loudspeaker** turns electrical signals into sound.
electromagnetic induction /ɪˌlektrəʊməgˈnetɪk ɪnˈdʌkʃn/	Moving a magnet in a coil causes **electromagnetic induction**.

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Word	Example
Fleming's right-hand rule /ˈflemɪŋz raɪt hænd ruːl/	**Fleming's right-hand rule** gives the direction of the induced current.
a.c. generator /ˌeɪ ˈsiː ˈdʒenəreɪtə/	An **a.c. generator** gives a current that changes direction.
slip rings /slɪp rɪŋz/	**Slip rings** connect the spinning coil to the outside wires.
brushes /ˈbrʌʃɪz/	Carbon **brushes** press against the slip rings.
Fleming's left-hand rule /ˈflemɪŋz left hænd ruːl/	Use **Fleming's left-hand rule** to find the force on the wire.
deflect /dɪˈflekt/	A magnet can **deflect** a beam of electrons.
turning effect /ˈtɜːnɪŋ ɪˈfekt/	A longer spanner gives a bigger **turning effect**.
d.c. motor /ˌdiː ˈsiː ˈməʊtə/	A **d.c. motor** spins a coil in a magnetic field.
split-ring commutator /splɪt rɪŋ ˈkɒmjuːteɪtə/	The **split-ring commutator** reverses the current every half-turn.
soft-iron core /sɒft ˈaɪən kɔː/	A **soft-iron core** makes an electromagnet stronger.
primary coil /ˈpraɪməri kɔɪl/	The **primary coil** is joined to the input supply.
secondary coil /ˈsekəndəri kɔɪl/	The **secondary coil** gives the output voltage.
step-up /step ʌp/	A **step-up** transformer raises the voltage.
step-down /step daʊn/	A **step-down** transformer lowers the voltage.

Word	Example
high-voltage transmission /haɪ ˈvəʊltɪdʒ trænˈsmɪʃn/	**High-voltage transmission** wastes less energy in the cables.

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