4 · Further Mechanics, Fields and Particles

Pearson Edexcel · International A-Level · Physics · Vocabulary in context

Word	Example
Momentum /məʊ'mentəm/	**Momentum** is mass times velocity.
Impulse /'ɪmpʌls/	**Impulse** is force times time.
isolated system /'aɪsəleɪtɪd 'sɪstəm/	A perfect flask is an **isolated system**: nothing goes in or out.
elastic collision /ɪ'læstɪk kə'lɪʒn/	In an **elastic collision**, no kinetic energy is lost.
inelastic collision /ɪnɪ'læstɪk kə'lɪʒn/	Two cars that stick together have an **inelastic collision**.
• **non-relativistic particle** /nɒn ˌrelətɪ'vɪstɪk 'paːtɪkl/	A slow electron is a **non-relativistic particle**, so $p = mv$ works.
radian /'reɪdɪən/	One full turn is an angle of 2π **radians**.
Angular velocity /'æŋgjʊlə və'lɒsɪti/	**Angular velocity** is the angle turned each second.
tangential speed /tæn'dʒenʃl spiːd/	The edge of a spinning disc has a high **tangential speed**.
centripetal force /sen'trɪpɪtl fɔːs/	The string gives the **centripetal force** to the spinning ball.
electric field /ɪ'lektrɪk fiːld/	A charged ball has an **electric field** around it.

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Electric field strength /ɪ'lektrɪk fiːld streŋθ/	**Electric field strength** is the force on each coulomb of charge.
Electric potential /ɪ'lektrɪk pə'tenʃl/	**Electric potential** is the energy per coulomb of charge at a point.
equipotential /ˌiːkwɪpə'tenʃl/	Every point on an **equipotential** has the same potential.
capacitor /kə'pæsɪtə/	A **capacitor** stores a small electric charge.
Capacitance /kə'pæsɪtəns/	**Capacitance** is charge divided by potential difference.
time constant /taɪm 'kɒnstənt/	The **time constant** is RC. RC
Magnetic flux density /mæg'netɪk flʌks 'densɪti/	A strong magnet has a high **magnetic flux density**.
Fleming's left-hand rule /'flemɪŋz left hænd ruːl/	Use **Fleming's left-hand rule** to find the force on the wire.
Magnetic flux /mæg'netɪk flʌks/	**Magnetic flux** is the field times the area it passes through.
Flux linkage /flʌks 'lɪŋkɪdʒ/	**Flux linkage** is the flux through one turn times the number of turns.
Electromagnetic induction /ɪˌlektrəʊməg'netɪk ɪn'dʌkʃn/	**Electromagnetic induction** makes a current when a magnet moves in a coil.
Faraday's law /'færədeɪ lɔː/	**Faraday's law** says a faster change of flux gives a bigger e.m.f.
Lenz's law /'lentsɪz lɔː/	**Lenz's law** says the current opposes the change.

Word	Example
# **proton number** /ˈprəʊtɒn ˈnʌmbə/	Carbon has a **proton number** of 6. 6
Σ **nucleon number** /ˈnjuːklɪən ˈnʌmbə/	The **nucleon number** counts protons and neutrons.
Thermionic emission /ˌθɜːmɪˈɒnɪk ɪˈmɪʃn/	**Thermionic emission** releases electrons from a hot metal wire.
linear accelerator /ˈlɪnɪə əkˈseləreɪtə/	A **linear accelerator** speeds up particles along a straight tube.
cyclotron /ˈsaɪklətrɒn/	A **cyclotron** speeds up particles along a spiral path.
quark–lepton model /kwɑːk ˈleptɒn ˈmɒdl/	The **quark–lepton model** puts protons in one group and electrons in another.
baryon /ˈbæriɒn/	A proton is a **baryon**: it is made of three quarks.
meson /ˈmiːzɒn/	A pion is a **meson**: one quark and one antiquark. π
• **lepton** /ˈleptɒn/	An electron is a **lepton**: it is not made of quarks.
± **antiparticle** /ˌæntɪˈpɑːtɪkl/	The positron is the **antiparticle** of the electron.
= **Mass–energy equivalence** /mæs ˈenədʒi ɪˈkwɪvələns/	**Mass–energy equivalence** is $E = mc^2$. $E = mc^2$
pair production /peə prəˈdʌkʃn/	In **pair production**, a photon turns into an electron and a positron.
annihilation /əˌnaɪəˈleɪʃn/	In **annihilation**, an electron and a positron turn into photons.

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