1 · Mechanics and Materials

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

Word	Example
Mechanics and Materials /mɪˈkænɪks ænd məˈtɪərɪəlz/	**Mechanics and Materials** covers motion, forces and how materials stretch.
asterisk /ˈæstərɪsk/	Look for an **asterisk** beside the question needing extended writing.
trigonometry /ˌtrɪgəˈnɒmətri/	**Trigonometry** connects angles with ratios of lengths.
unit /ˈjuːnɪt/	The metre is the **unit** of length.
significant figures /sɪgˈnɪfɪkənt ˈfɪgəz/	The number 0.0450 has three **significant figures**. 0.0450
vectors /ˈvektəz/	Fields are **vectors** and must be added by direction.
forces /ˈfɔːsɪz/	Unbalanced **forces** can change an object's velocity.
momentum /məʊˈmentəm/	A heavy truck has a lot of **momentum**.
energy /ˈenədʒi/	Food gives your body the **energy** it needs to move.
materials /məˈtɪərɪəlz/	Steel and rubber are very different **materials**.
displacement /dɪˈspleɪsmənt/	After walking 3 km east, your **displacement** is 3 km east. 3 km 3 km
distance /ˈdɪstəns/	The **distance** from home to school is 2 km. 2 km
scalar /ˈskeɪlə/	Mass is a **scalar** because it has no direction.

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velocity /vəˈlɒsɪti/	The ball's **velocity** is 5 m/s to the left.
speed /spiːd/	The bus moves at a **speed** of 15 m/s.
acceleration /əkˌseləˈreɪʃn/	The car speeds up quickly, so its **acceleration** is large.
gradient /ˈgreɪdɪənt/	The **gradient** of a distance-time graph gives the speed.
tangent /ˈtændʒənt/	Draw a **tangent** to the curve to find the gradient at one point.
area /ˈeərɪə/	The integral gives the **area** under the curve.
parabola /pəˈræbələ/	A thrown ball follows a **parabola**.
uniform acceleration /ˈjuːnɪfɔːm əkˌseləˈreɪʃn/	A car with **uniform acceleration** gains the same speed every second.
negligible /ˈneglɪdʒəbl/	For a heavy stone, air resistance is **negligible**.
light gate /laɪt geɪt/	A **light gate** measures the time when a card passes through it.
systematic offset /ˌsɪstəˈmætɪk ˈɒfset/	A balance always reading too high has a **systematic offset**.
perpendicular /ˌpɜːpənˈdɪkjʊlə/	Two **perpendicular** directions meet at a right angle.
scale diagram /skeɪl ˈdaɪəgræm/	A **scale diagram** represents larger forces with longer arrows.
equilibrium /ˌiːkwɪˈlɪbrɪəm/	The book is in **equilibrium** because the forces balance.

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Word	Example
projectile /prəˈdʒektaɪl/	A thrown ball is a **projectile**.
free-body diagram /fri: ˈbɒdi ˈdaɪəgræm/	Draw a **free-body diagram** with an arrow for each force.
centre of gravity /ˈsentə ɒv ˈgrævɪti/	A bus tips over if its **centre of gravity** is too high.
Newton's first law /ˈnju:tnz fɜ:st lɔ:/	**Newton's first law** says an object keeps moving unless a force acts.
Newton's second law /ˈnju:tnz ˈsekənd lɔ:/	**Newton's second law** says F = ma. $F = ma$
Newton's third law /ˈnju:tnz θɜ:d lɔ:/	**Newton's third law** says forces come in equal and opposite pairs.
weight /weɪt/	An object's **weight** is the gravitational force acting on it.
gravitational field strength /ˌgrævɪˈteɪʃənl fi:ld streŋθ/	The **gravitational field strength** on Earth is 9.81 N/kg. $9.81\ \mathrm{N/kg}$
terminal velocity /ˈtɜ:mɪnl vəˈlɒsɪti/	At **terminal velocity**, the falling object stops speeding up.
drag /dræg/	**Drag** slows down a boat in the water.
conservation of linear momentum /ˌkɒnsəˈveɪʃn ɒv ˈlɪnɪə məʊˈmentəm/	**Conservation of linear momentum** applies when no resultant external force acts.
isolated system /ˈaɪsəleɪtɪd ˈsɪstəm/	A perfect flask is an **isolated system**: nothing goes in or out.

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moment of a force /ˈməʊmənt əvə fɔːs/	The **moment of a force** is the force times its distance from the pivot.
pivot /ˈpɪvət/	The see-saw turns about its **pivot**.
perpendicular distance /ˌpɜːpənˈdɪkjʊlə ˈdɪstəns/	Measure the **perpendicular distance** from the pivot to the force.
principle of moments /ˈprɪnsɪpl ɒv ˈməʊmənts/	The see-saw balances, as the **principle of moments** says.
uniform /ˈjuːnɪfɔːm/	The rod is **uniform**: its mass is spread evenly.
work /wɜːk/	You do **work** when you push a box across the floor.
kinetic energy /kɪˈnetɪk ˈenədʒi/	A fast car has a lot of **kinetic energy**.
gravitational potential energy /ˌgrævɪˈteɪʃənl pəˈtenʃl ˈenədʒi/	A book on a high shelf has more **gravitational potential energy**.
conservation of energy /ˌkɒnsəˈveɪʃn ɒv ˈenədʒi/	**Conservation of energy** means energy is never made or destroyed.
power /ˈpaʊə/	A 60 W lamp has a **power** of 60 watts. 60 W 60
efficiency /ɪˈfɪʃənsi/	A lamp with 20% **efficiency** turns only a fifth of its energy into light. 20%
density /ˈdensɪti/	Iron has a higher **density** than wood, so it sinks in water.
upthrust /ˈʌpθrʌst/	**Upthrust** from the water holds up a boat.

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fluid displaced /ˈfluːɪd dɪˈspleɪst/	The **fluid displaced** is the water pushed aside by the object.
Stokes' law /stəʊks lɔː/	**Stokes' law** gives the drag on a small ball falling through oil.
laminar flow /ˈlæmɪnɑː fləʊ/	In **laminar flow**, neighbouring fluid layers move smoothly.
viscosity /vɪˈskɒsɪti/	Oil has a higher **viscosity** than water.
turbulence /ˈtɜːbjʊləns/	Swirling, irregular fluid motion is **turbulence**.
Hooke's law /hʊks lɔː/	**Hooke's law** says the extension is proportional to the force.
stiffness /ˈstɪfnəs/	Greater **stiffness** means more force for the same extension.
spring constant /sprɪŋ ˈkɒnstənt/	A stiff spring has a large **spring constant**.
stress /stres/	The **stress** in the wire is the force divided by its area.
strain /streɪn/	**Strain** is the extension divided by the original length.
Young modulus /jʌŋ ˈmɒdjʊləs/	Steel has a high **Young modulus**, so it is hard to stretch.
limit of proportionality /ˈlɪmɪt ɒv prəˌpɔːʃəˈnælɪti/	After the **limit of proportionality**, the graph is no longer straight.
elastic limit /ɪˈlæstɪk ˈlɪmɪt/	Past its **elastic limit**, the spring stays longer.
elastic deformation /ɪˈlæstɪk ˌdiːfɔːˈmeɪʃn/	**Elastic deformation** disappears after the force is removed.

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Word	Example
plastic deformation /ˈplæstɪk ˌdiːfoːˈmeɪʃn/	**Plastic deformation** remains after the force is removed.
yield point /jiːld pɔɪnt/	At the **yield point**, a material starts substantial plastic deformation.
breaking stress /ˈbreɪkɪŋ stres/	The **breaking stress** is the tensile stress at fracture.
elastic strain energy /ɪˈlæstɪk streɪn ˈenədʒi/	A stretched spring stores **elastic strain energy**.
per unit volume /pɜː ˈjuːnɪt ˈvɒljuːm/	Energy **per unit volume** means energy divided by volume.
micrometer /maɪˈkrɒmɪtə/	Use a **micrometer** to measure the thickness of a coin.

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