Physical quantities and units

A-Level Physics · Vocabulary in context

Word	Example
physical quantity /ˈfɪzɪkl ˈkwɒntɪti/	Length is a **physical quantity** because we can measure it.
magnitude /ˈmægnɪtjuːd/	The force has a **magnitude** of 20 N.
unit /juːnɪt/	The metre is the **unit** of length.
estimate /ˈestɪmət/	**Estimate** the height of the door before you measure it.
mass /mæs/	The **mass** of this bag of rice is 5 kg.
weight /weɪt/	Your **weight** is the pull of the Earth on you.
vacuum /ˈvækjuːm/	There is no air in a **vacuum**, so sound cannot travel through it.
acceleration /əkˌseləˈreɪʃn/	The car speeds up quickly, so its **acceleration** is large.
free fall /friː fɔːl/	A stone dropped from a bridge is in **free fall**.
density /ˈdensɪti/	Iron has a higher **density** than wood, so it sinks in water.
atmospheric pressure /ˌætməsˈferɪk ˈpreʃə/	**Atmospheric pressure** is the push of the air around us.
order of magnitude /ˈɔːdə ɒv ˈmægnɪtjuːd/	A car is about 1000 kg, so its mass has an **order of magnitude** of 1000 kg.
SI units /ˌes ˈaɪ ˈjuːnɪts/	Metres, kilograms and seconds are **SI units**.

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Word	Example
base quantity /beɪs ˈkwɒntɪti/	Length is a **base quantity**, but speed is not.
length /leŋθ/	Measure the **length** of the table with a ruler.
current /ˈkʌrənt/	The **current** in the lamp is 0.5 A. 0.5 A
ampere /ˈæmpeə/	The **ampere** is the unit of electric current.
temperature /ˈtemprɪtʃə/	The thermometer shows the water's **temperature**.
kelvin /ˈkelvɪn/	Water freezes at 273 **kelvin**. 273
mole /məʊl/	One **mole** of carbon has a mass of 12 g. 12 g
derived unit /dɪˈraɪvd ˈjuːnɪt/	The metre per second is a **derived unit**.
speed /spiːd/	The bus moves at a **speed** of 15 m/s. 15 m/s
velocity /vəˈlɒsɪti/	The ball's **velocity** is 5 m/s to the left. 5 m/s
force /fɔːs/	You use a **force** to push a door open.
newton /ˈnjuːtn/	The **newton** is the unit of force.
work /wɜːk/	You do **work** when you push a box across the floor.
energy /ˈenədʒi/	Food gives your body the **energy** it needs to move.
joule /dʒuːl/	Lifting an apple by one metre takes about one **joule** of energy.
power /ˈpaʊə/	A 60 W lamp has a **power** of 60 watts. 60 W 60

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Word	Example
watt /wɒt/	One **watt** means one joule every second.
pressure /'preʃə/	A sharp knife puts a large **pressure** on the bread.
stress /stres/	The **stress** in the wire is the force divided by its area.
pascal /'pæskl/	The **pascal** is the unit of pressure.
homogeneous /ˌhɒmə'dʒi:niəs/	Both sides of the equation have the same units, so it is **homogeneous**.
prefix /'pri:fɪks/	The **prefix** "kilo" means one thousand. "kilo"
measurement /'meʒəmənt/	Repeat each **measurement** three times.
uncertainty /ʌn'sɜ:tənti/	The length is 25.0 cm with an **uncertainty** of 0.1 cm. 25.0 cm 0.1 cm
systematic error /ˌsɪstə'mætɪk 'erə/	A scale that reads too high gives a **systematic error**.
zero error /'zɪərəʊ 'erə/	The meter shows 0.2 V with nothing connected: a **zero error**. 0.2 V
calibration /ˌkælɪ'breɪʃn/	**Calibration** checks a thermometer against known temperatures.
parallax /'pærəlæks/	Look straight at the scale to avoid **parallax** errors.
accuracy /'ækjʊrəsi/	**Accuracy** tells you how close a result is to the true value.
precision /prɪ'sɪʒn/	Readings with high **precision** are all very close to each other.

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random error /ˈrændəm ˈerə/	Small changes in your reaction time cause a **random error**.
instrument /ˈɪnstrəmənt/	A ruler is a simple measuring **instrument**.
mean /miːn/	Add the three readings and divide by three to find the **mean**.
intercept /ˌɪntəˈsept/	The line crosses the y-axis at the **intercept**. y
division /dɪˈvɪʒn/	One **division** on this ruler is 1 mm. 1 mm
reaction time /rɪˈækʃn taɪm/	Your **reaction time** is the delay before you press the stopwatch.
half the range /hɑːf ðə reɪndʒ/	Take **half the range** of the readings as the uncertainty.
absolute uncertainty /ˈæbsəluːt ʌnˈsɜːtənti/	The **absolute uncertainty** in 25.0 ± 0.1 cm is 0.1 cm. 25.0 ± 0.1 cm 0.1 cm
percentage uncertainty /pəˈsentɪdʒ ʌnˈsɜːtənti/	0.1 cm out of 25.0 cm is a **percentage uncertainty** of 0.4%. 0.1 cm 25.0 cm 0.4%
derived quantity /dɪˈraɪvd ˈkwɒntɪti/	Speed is a **derived quantity**, found from distance and time.
diameter /daɪˈæmɪtə/	Measure the **diameter** of the wire with a micrometer.
volume /ˈvɒljuːm/	The **volume** of the box is $2\ \text{m} \times 1\ \text{m} \times 1\ \text{m} = 2\ \text{m}^3$. $2\ \text{m} \times 1\ \text{m} \times 1\ \text{m} = 2\ \text{m}^3$
percentage difference /pəˈsentɪdʒ ˈdɪfrəns/	The two answers have a **percentage difference** of 5%. 5%

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significant figures /sɪgˈnɪfɪkənt ˈfɪgəz/	The number 0.0450 has three **significant figures**. 0.0450
same number of significant figures /seɪm ˈnʌmbə ɒv sɪgˈnɪfɪkənt ˈfɪgəz/	Give the answer to the **same number of significant figures** as the data.
error bar /ˈerə bɑː/	Each point on the graph has an **error bar** to show its uncertainty.
line of best fit /laɪn ɒv best fɪt/	Draw a **line of best fit** through the points.
worst acceptable line /wɜːst əkˈseptəbl laɪn/	The **worst acceptable line** still passes through all the error bars.
independent variable /ˌɪndɪˈpendənt ˈveərɪəbl/	The **independent variable** is the one you change.
dependent variable /dɪˈpendənt ˈveərɪəbl/	The **dependent variable** is the one you measure.
control variables /kənˈtrəʊl ˈveərɪəblz/	Keep the **control variables**, such as the temperature, the same.
micrometer /maɪˈkrɒmɪtə/	Use a **micrometer** to measure the thickness of a coin.
scalar /ˈskeɪlə/	Mass is a **scalar** because it has no direction.
vector /ˈvektə/	Velocity is a **vector** because it has a direction.
electric charge /ɪˈlektrɪk tʃɑːdʒ/	A rubbed balloon has an **electric charge**.
displacement /dɪˈspleɪsmənt/	After walking 3 km east, your **displacement** is 3 km east. 3 km 3 km

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Word	Example
momentum /məʊˈmentəm/	A heavy truck has a lot of **momentum**.
coplanar /ˌkəʊˈpleɪnə/	All three forces lie on the same flat page: they are **coplanar**.
resultant /rɪˈzʌltənt/	The **resultant** of 3 N and 4 N at right angles is 5 N. 3 N 4 N 5 N
scale drawing /skeɪl ˈdrɔːɪŋ/	In the **scale drawing**, 1 cm stands for 10 N. 1 cm 10 N
perpendicular /ˌpɜːpənˈdɪkjʊlə/	The wall is **perpendicular** to the floor.
component /kəmˈpəʊnənt/	Find the vertical **component** of the ball's velocity.
horizontal /ˌhɒrɪˈzɒntl/	The floor is **horizontal**.
vertical /ˈvɜːtɪkl/	A falling stone moves in a **vertical** line.
inclined plane /ɪnˈklaɪnd pleɪn/	A box slides down an **inclined plane**.

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