Modern Physics

AP Physics 2 · Vocabulary in context

Word	Example
quanta /ˈkwɒntə/	Light energy comes in small packets called **quanta**.
photons /ˈfəʊtɒnz/	Light is made of tiny packets called **photons**.
Wave–particle duality /weɪv ˈpɑːtɪkl djuːˈælɪti/	**Wave–particle duality** means light acts as both a wave and a particle.
double-slit experiment /ˈdʌbl slɪt ekˈsperɪmənt/	The **double-slit experiment** shows that light is a wave.
de Broglie wavelength /də ˈbrəʊli ˈweɪvleŋθ/	A fast electron has a short **de Broglie wavelength**.
quantized /ˈkwɒntaɪzd/	Charge is **quantized**: it comes in whole multiples of e.
nucleon /ˈnjuːklɪən/	A proton or a neutron is a **nucleon**.
isotope /ˈaɪsətəʊp/	Carbon-14 is an **isotope** of carbon.
ion /ˈaɪɒn/	An **ion** is an atom that has gained or lost electrons.
Bohr model /ˈbəʊə ˈmɒdl/	In the **Bohr model**, electrons move only in fixed energy levels.
energy levels /ˈenədʒi ˈlevlz/	Electrons sit in **energy levels** around the nucleus.
emission spectrum /ɪˈmɪʃn ˈspektrəm/	A hot gas gives a bright-line **emission spectrum**.

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absorption spectrum /əb'sɔ:pʃn 'spektrəm/	An **absorption spectrum** has dark lines.
ground state /graʊnd steɪt/	The **ground state** is the lowest energy level.
excited state /ek'saɪtɪd steɪt/	An atom in an **excited state** has extra energy.
ionization energy /ˌaɪənaɪ'zeɪʃn 'enədʒi/	The **ionization energy** of hydrogen is 13.6 eV. 13.6 eV
blackbody /'blækbɒdi/	A **blackbody** absorbs all the light that hits it.
Wien's law /vi:nz lɔ:/	**Wien's law** says that hotter objects emit their peak radiation at shorter wavelengths.
Stefan–Boltzmann law /'stefən 'bɒltsmən lɔ:/	The **Stefan–Boltzmann law** gives the power of a star.
photoelectric effect /ˌfəʊtəʊɪ'lektrɪk ɪ'fekt/	In the **photoelectric effect**, light knocks electrons out of a metal.
work function /wɜ:k 'fʌŋkʃn/	A metal's **work function** is the energy needed to free an electron.
threshold frequency /'θreʃəʊld 'fri:kwənsi/	Light below the **threshold frequency** frees no electrons.
stopping potential /'stɒpɪŋ pə'tenʃl/	A **stopping potential** of 2 V stops the fastest electrons. 2 V
Compton scattering /'kɒmptn 'skætərɪŋ/	In **Compton scattering**, an X-ray loses energy to an electron. X

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nucleus /ˈnjuːklɪəs/	The **nucleus** is at the centre of an atom.
Fission /ˈfɪʃn/	**Fission** splits a big nucleus into two smaller ones.
Fusion /ˈfjuːʒn/	**Fusion** joins small nuclei into a bigger one, as in the Sun.
strong force	The **strong force** holds protons and neutrons together in the nucleus.
radioactive decay /ˌreɪdɪəʊˈæktɪv dɪˈkeɪ/	**Radioactive decay** changes one element into another.
Alpha decay /ˈælfə dɪˈkeɪ/	In **alpha decay**, a nucleus gives out two protons and two neutrons.
Beta decay /ˈbiːtə dɪˈkeɪ/	In **beta decay**, a neutron turns into a proton and gives out an electron.
antineutrino /ˌæntɪnjuːˈtriːnəʊ/	Beta-minus decay also gives out an **antineutrino**. β
positron /ˈpɒzɪtrɒn/	A **positron** is like an electron with a positive charge.
neutrino /njuːˈtriːnəʊ/	A **neutrino** has almost no mass.
Gamma decay /ˈgæmə dɪˈkeɪ/	In **gamma decay**, a nucleus gives out energy as a gamma ray.
half-life /hɑːf laɪf/	After one **half-life**, half the nuclei have decayed.
lepton number /ˈleptɒn ˈnʌmbə/	**Lepton number** stays the same before and after a reaction.

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↘ **decay constant** /dɪ'keɪ 'kɒnstənt/	A large **decay constant** means fast decay.

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