

AQA GCSE Physics – Equations & Formulae (specification 8463 & 8464)

Unit 1: Energy

Equations to Learn	
kinetic energy = $\frac{1}{2} \times \text{mass} \times \text{speed}^2$	$E_k = \frac{1}{2}mv^2$
GPE = mass $\times$ gravitational field strength $\times$ height	$E_p = mgh$
power = $\frac{\text{work done}}{\text{time taken}} = \frac{\text{energy transferred}}{\text{time taken}}$	$P = \frac{W}{t} = \frac{E}{t}$
efficiency = $\frac{\text{useful energy output}}{\text{total energy input}}$	
efficiency = $\frac{\text{useful power output}}{\text{total power input}}$	
Equations shown in the exam	
elastic potential energy = $0.5 \times \text{spring constant} \times (\text{extension})^2$	$E_e = \frac{1}{2}kx^2$
change in thermal energy = mass $\times$ specific heat capacity $\times$ temperature change	$\Delta E = mc\Delta\theta$

Unit 2: Electricity

Equations to Learn	
charge flow = current $\times$ time	$Q = It$
potential difference = current $\times$ resistance	$V = IR$
total resistance = resistance of component 1 + resistance of component 2	$R_t = R_1 + R_2$
power = current $\times$ potential difference	$P = IV$
power = (current) <sup>2</sup> $\times$ resistance	$P = I^2R$
energy transferred = power $\times$ time	$E = Pt$
energy transferred = charge flow $\times$ potential difference	$E = QV$

\* Higher tier only

\* Separate Physics only

Unit 3: Particle Model of Matter

Equations to Learn	
density = $\frac{\text{mass}}{\text{volume}}$	$\rho = \frac{m}{V}$
Equations shown in the exam	
change in thermal energy = mass $\times$ specific heat capacity $\times$ temperature change	$\Delta E = mc\Delta\theta$
thermal energy for a change in state = mass $\times$ specific latent heat	$E = mL$
* for a gas, pressure $\times$ volume = constant	$pV = \text{constant}$

Unit 6: Waves

Equations to Learn	
wave speed = frequency $\times$ wavelength	$v = f\lambda$
Equations shown in the exam	
time period = $\frac{1}{\text{frequency}}$	$T = \frac{1}{f}$
* magnification = $\frac{\text{image height}}{\text{object height}}$	$M = \frac{h_{\text{image}}}{h_{\text{object}}}$

Unit 7: Magnetism and Electromagnetism

Equations shown in the exam	
* Force = magnetic flux density $\times$ current $\times$ length of conductor in magnetic field	$F = BIL$
$\frac{\text{potential difference across primary coil}}{\text{potential difference across secondary coil}} = \frac{\text{number of turns in primary coil}}{\text{number of turns in secondary coil}}$	$\frac{V_p}{V_s} = \frac{N_p}{N_s}$
* * p.d. across primary $\times$ current in primary = p.d. across secondary $\times$ current in secondary	$V_p I_p = V_s I_s$

Unit 5: Forces

Equations to Learn	
weight = mass $\times$ gravitational field strength	$W = mg$
work done = force $\times$ distance (moved along the line of action of the force)	$W = Fs$
force = spring constant $\times$ extension	$F = kx$
moment of a force = force $\times$ distance (perpendicular to the direction of the force)	$M = Fd$
pressure = $\frac{\text{force normal to a surface}}{\text{area of that surface}}$	$P = \frac{F}{A}$
distance travelled = speed $\times$ time	$s = vt$
acceleration = $\frac{\text{change in velocity}}{\text{time taken}}$	$a = \frac{\Delta v}{t}$
$= \frac{\text{final velocity} - \text{initial velocity}}{\text{time taken}}$	$= \frac{v - u}{t}$
resultant force = mass $\times$ acceleration	$F = ma$
* momentum = mass $\times$ velocity	$p = mv$
Equations shown in the exam	
* * Pressure = height of column $\times$ density of liquid $\times$ gravitational field strength	$p = h\rho g$
* final velocity <sup>2</sup> - (initial velocity) <sup>2</sup> = 2 $\times$ acceleration $\times$ distance	$v^2 - u^2 = 2as$
* * Force = $\frac{\text{change in momentum}}{\text{time taken}}$	$F = \frac{m\Delta v}{t}$

Unit 4: Atomic Structure & Unit 8: Space

There are no equations in these sections of the course

# As Physics Edexcel

**R Sandford**



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**Edexcel AS Physics** Ann Fullick, Edexcel (Organization), Patrick Fullick, Sue Howarth, Keith Gibbs, 2008-01-01 Edexcel's own resources for the GCE 2008 specifications [Edexcel AS Physics](#) Mike Benn, 2012 **As Physics Edexcel Revision Guide** CGP Books, 2008-07 **Edexcel AS Physics Revision Guide** Tim Tuggey, Richard Laird, Pauline C. Anning, Keith Bridgeman, 2009 Written by experienced examiners this revision guide for AS and A2 provides tailored support for the 2008 specification **Implementation and assessment guide for teachers and technicians** Ann Fullick, Patrick Fullick, Sue Howarth, Miles Hudson, 2008 Edexcel's own resources for the GCE 2008 specifications *Edexcel AS Physics* Mike Benn (Physics teacher), 2009 [Edexcel AS Physics Student Unit Guide: Unit 1 Physics on the Go](#) Mike Benn, 2009-05-29 Student Unit Guides are perfect for revision Each guide is written by an examiner and explains the unit requirements summarises the relevant unit content and includes a series of specimen questions and answers There are three sections to each guide Introduction includes advice on how to use the guide an explanation of the skills being tested by the assessment objectives an outline of the unit or module and depending on the unit suggestions for how to revise effectively and prepare for the examination questions Content Guidance provides an examiner's overview of the module's key terms and concepts and identifies opportunities to exhibit the skills required by the unit It is designed to help students to structure their revision and make them aware of the concepts they need to understand the exam and how they might analyse and evaluate topics Question and Answers sample questions and with graded answers which have been carefully written to reflect the style of the unit All responses are accompanied by commentaries which highlight their respective strengths and weaknesses giving students an insight into the mind of the examiner **Edexcel AS Physics Student Unit Guide** Mike Benn, 2012-08-01 Perfect for revision these guides explain the unit requirements summarise the content and include specimen questions with graded answers Each full colour New Edition Student Unit Guide provides ideal preparation for your unit exam Feel confident you understand the unit each guide comprehensively covers the unit content and includes topic summaries knowledge check questions and a reference index Get to grips with the exam requirements the specific skills on which you will be tested are explored and explained Analyse exam style questions graded student responses will help you focus on areas where you can improve your exam technique and performance **Edexcel AS Physics Revision Guide**, 2009 **Edexcel AS/A Level Physics** Miles Hudson, 2015 Created for the new 2015 Edexcel AS and A level specifications our new Student Books cover the topics comprehensively developing scientific thinking in your students providing them with a deep understanding of the subject and creating confident independent scientists *Edexcel AS Physics Student Unit Guide: Unit 2 Physics at Work* Mike Benn, 2009-08-28 Improve your grades by focusing revision and build confidence and strengthen exam technique Student Unit Guides are perfect for revision Each guide is written by an examiner and explains the unit requirements summarises the relevant unit content and includes a series of specimen questions and answers There are three

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**Edexcel AS Physics** Ann Fullick,2008

**Edexcel as Physics Student Unit Guide** Mike Benn,2012 Focused revision for your best possible grade

**Edexcel AS Physics Student Unit Guide New Edition: Unit 2 Physics at Work** Mike Benn,2012-10-26 Written by a senior examiner Mike Benn this Edexcel AS Physics Student Unit Guide is the essential study companion for Unit 2 Physics at Work This full colour book includes all you need to know to prepare for your unit exam clear guidance on the content of the unit with topic summaries knowledge check questions and a quick reference index examiner s advice throughout so you will know what to expect in the exam and will be able to demonstrate the skills required exam style questions with graded student responses so you can see clearly what is required to get a better grade

[Physics at Work](#) Graham George, Mike Benn,2009-08-01 Each of the books in the Student Unit Guide series are written by an examiner and explain the unit requirements summarise the relevant unit content and include a series of specimen questions and answers

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[Edexcel AS Physics](#) Mike Benn (Physics teacher),2009

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## **Table of Contents As Physics Edexcel**

1. Understanding the eBook As Physics Edexcel
  - The Rise of Digital Reading As Physics Edexcel
  - Advantages of eBooks Over Traditional Books
2. Identifying As Physics Edexcel
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an As Physics Edexcel
  - User-Friendly Interface
4. Exploring eBook Recommendations from As Physics Edexcel
  - Personalized Recommendations
  - As Physics Edexcel User Reviews and Ratings
  - As Physics Edexcel and Bestseller Lists
5. Accessing As Physics Edexcel Free and Paid eBooks
  - As Physics Edexcel Public Domain eBooks
  - As Physics Edexcel eBook Subscription Services
  - As Physics Edexcel Budget-Friendly Options
6. Navigating As Physics Edexcel eBook Formats

- ePub, PDF, MOBI, and More
  - As Physics Edexcel Compatibility with Devices
  - As Physics Edexcel Enhanced eBook Features
7. Enhancing Your Reading Experience
    - Adjustable Fonts and Text Sizes of As Physics Edexcel
    - Highlighting and Note-Taking As Physics Edexcel
    - Interactive Elements As Physics Edexcel
  8. Staying Engaged with As Physics Edexcel
    - Joining Online Reading Communities
    - Participating in Virtual Book Clubs
    - Following Authors and Publishers As Physics Edexcel
  9. Balancing eBooks and Physical Books As Physics Edexcel
    - Benefits of a Digital Library
    - Creating a Diverse Reading Collection As Physics Edexcel
  10. Overcoming Reading Challenges
    - Dealing with Digital Eye Strain
    - Minimizing Distractions
    - Managing Screen Time
  11. Cultivating a Reading Routine As Physics Edexcel
    - Setting Reading Goals As Physics Edexcel
    - Carving Out Dedicated Reading Time
  12. Sourcing Reliable Information of As Physics Edexcel
    - Fact-Checking eBook Content of As Physics Edexcel
    - Distinguishing Credible Sources
  13. Promoting Lifelong Learning
    - Utilizing eBooks for Skill Development
    - Exploring Educational eBooks
  14. Embracing eBook Trends
    - Integration of Multimedia Elements
    - Interactive and Gamified eBooks

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