Electricity CPD with Isaac Physics

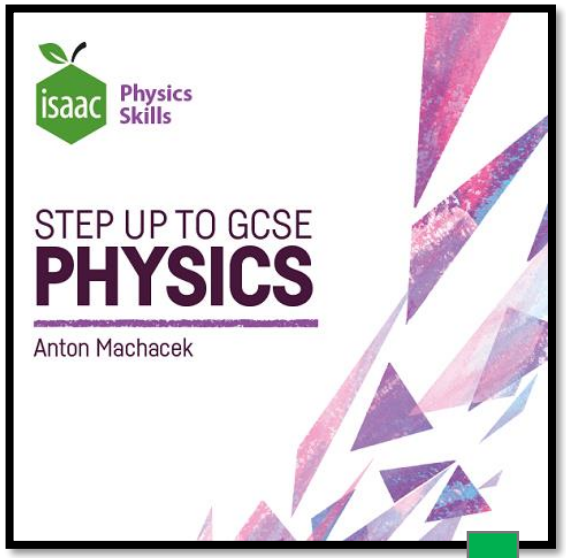
- In my varied role I am currently teaching my own A-level classes (having taught Y7-13 in my previous school), but also run masterclasses and CPD for students and teachers in feeder schools.

- The following slides have been ‘lifted’ from my lesson powerpoint on Electricity.

- Following a CPD session I’ll share this powerpoint with other teachers, which is why there is clear signposting to the level of difficulty.

Practice Questions: Ohm's Law

Physics. You work it out.

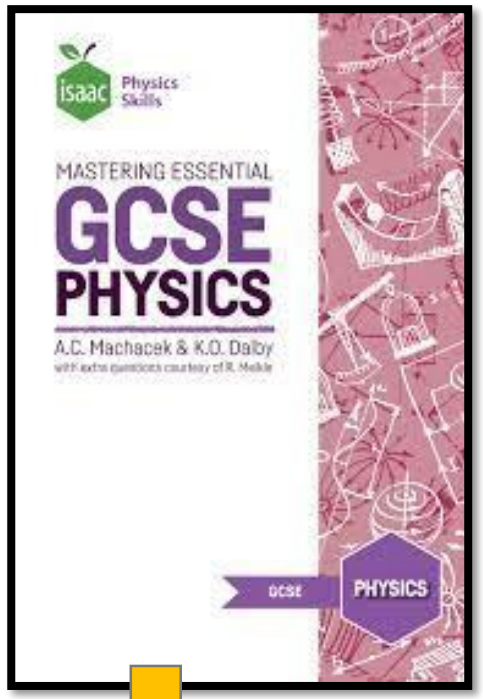


- Step up to GCSE

  Chapter 21: Resistance

- Essential GCSE

  Chapter 24: Resistance



Can you also use standard form and prefixes?

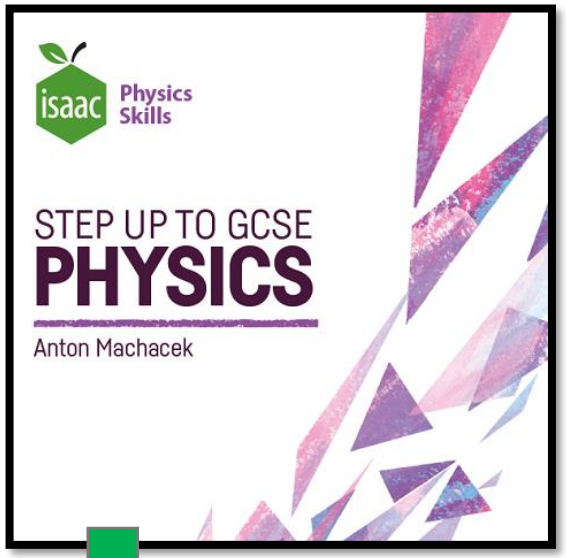
Can you rearrange and apply these equations?

$$R = \frac{V}{I} \leftrightarrow V = IR \leftrightarrow I = \frac{V}{R}$$

Prefix (symbol)	In words	Multiply by
tera (T)	Trillion	100000000000
giga (G)	Billion	1000000000
mega (M)	Million	1000000
kilo (k)	Thousand	1000
		1
centi (c)	Hundredth	1/100
milli (m)	Thousandth	1/1000
micro (μ)	Millionth	1/1000000
nano (n)	Billionth	1/1000000000

Practice Questions: Kirchhoff's Laws

Physics. You work it out.



Can you apply Kirchhoff's two laws to either parallel or series circuits?

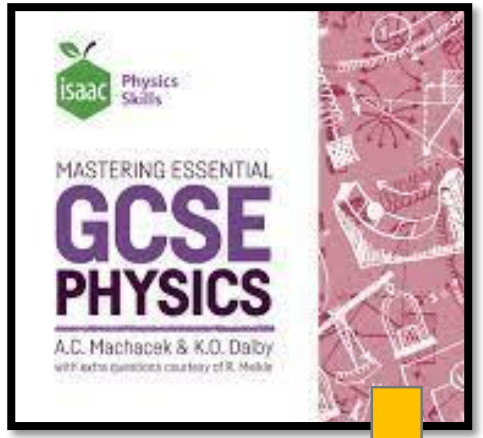
- Step up to GCSE

Chapter 20: Current in Circuits

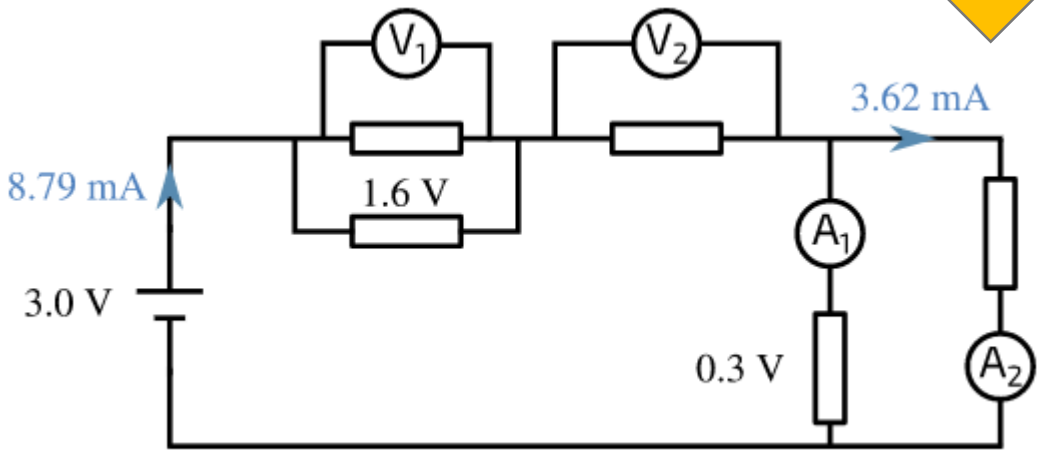
Chapter 23: Sharing Voltage

- Essential GCSE

Chapter 23: Current and Voltage – Circuit Rules

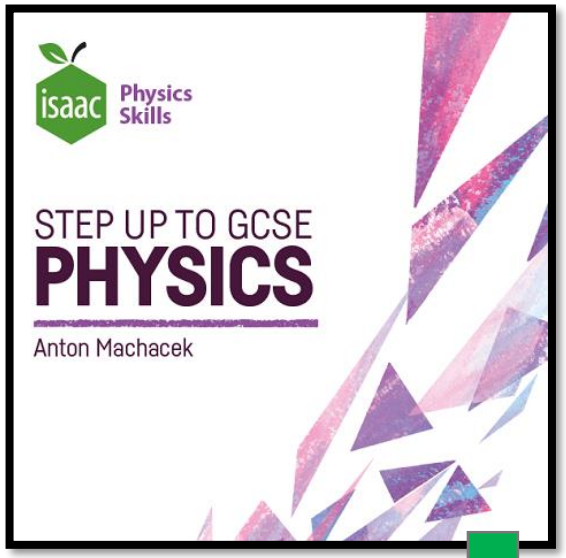


Can you handle combined circuits? *For example…*



Practice Questions: Power

Physics. You work it out.



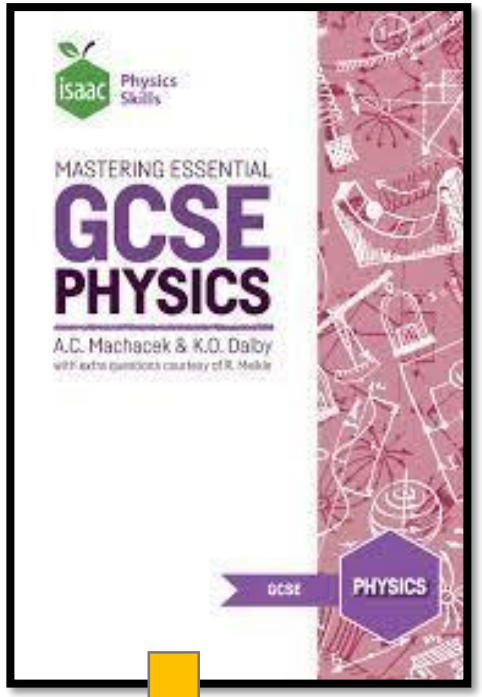
- Step up to GCSE

Chapter 22: Electrical Power

- Essential GCSE

Chapter 26: Power Calculations

27: Resistance and Power



Can you rearrange and apply these equations?

… and also…

- use prefixes M and k
- read data from graphs

Pick the best option

$$V = \frac{P}{I} \leftrightarrow P = IV \leftrightarrow I = \frac{P}{V}$$

$$P = IV = I^2R = \frac{V^2}{R}$$

End of Topic Revision

A Level or equivalent

A Level Physics Lessons

Resources for learning and consolidation

Remote Revision Lessons: A level / IB...

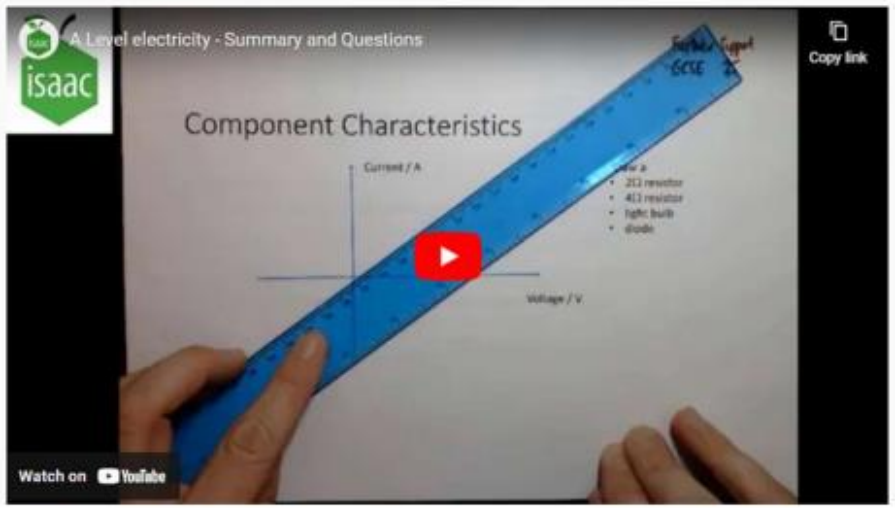
These resources consist of:

- an introductory lesson explaining and revising all key concepts in a topic. Periodically questions are set during the course of the lesson, which appear on screen. Usually a question is worked through as an example first.
- in many cases, a one-side summary reference sheet with the essential equations
- videos giving worked answers to all the questions set during the lesson
- links to relevant **individual concept lessons** for students to follow up areas requiring further revision. These concept lessons comprise introductory explanation videos, sets of practice questions which will be automatically marked, and a 30-minute tutorial video showing how these practice questions can be answered.

If you have any queries following your use of these resources, please do contact us.

Electricity

Video presentation



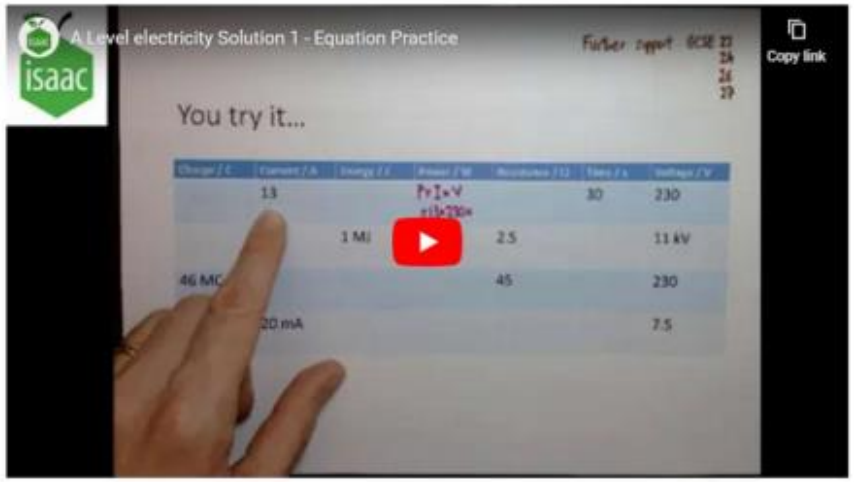
Summary | **Answers** | Q & A | Resources

Contents

The videos below are worked solutions to the practice questions:

- Equation practice
- Charge carriers
- Resistor combinations
- Resistivity
- Characteristics
- Potential divider
- Potential divider with parallel
- Solved circuit

Equation practice



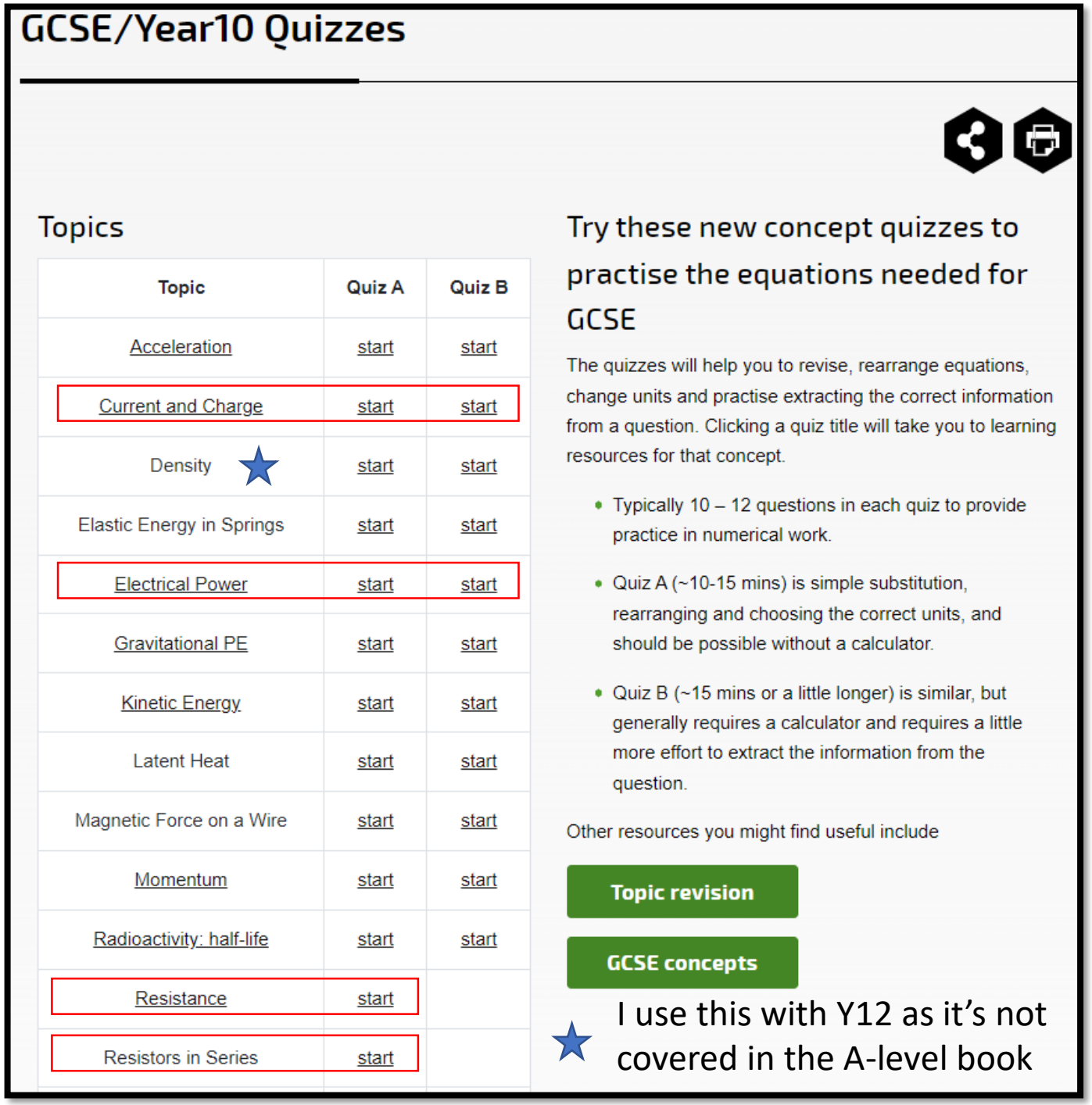
See also:

Concept lesson 22 - Charge and Current
Concept lesson 24 - Resistance
Concept lesson 26 - Power Calculations
Concept lesson 27 - Resistance and Power

I find these quizzes a useful ‘gateway’ into moving from science being qualitative to quantitative, and with worked examples use them from Y7.

At Y10 I would:

- (re-)introduce the equation in class
- do a worked example
- Set quiz A&B
- 15-min timer, circulate, fire-fight, appoint peer ambassadors etc.
- Move on to the next task…
- Finish the rest for homework.



GCSE/Year10 Quizzes

Topics

Topic	Quiz A	Quiz B
Acceleration	start	start
Current and Charge	start	start
Density ★	start	start
Elastic Energy in Springs	start	start
Electrical Power	start	start
Gravitational PE	start	start
Kinetic Energy	start	start
Latent Heat	start	start
Magnetic Force on a Wire	start	start
Momentum	start	start
Radioactivity: half-life	start	start
Resistance	start	
Resistors in Series	start	

Try these new concept quizzes to practise the equations needed for GCSE

The quizzes will help you to revise, rearrange equations, change units and practise extracting the correct information from a question. Clicking a quiz title will take you to learning resources for that concept.

- Typically 10 – 12 questions in each quiz to provide practice in numerical work.
- Quiz A (~10-15 mins) is simple substitution, rearranging and choosing the correct units, and should be possible without a calculator.
- Quiz B (~15 mins or a little longer) is similar, but generally requires a calculator and requires a little more effort to extract the information from the question.

Other resources you might find useful include

Topic revision

GCSE concepts

★ I use this with Y12 as it’s not covered in the A-level book