

Isaac Physics Teacher CPD

Using Isaac COVID-19 lessons in class, for remote teaching and setting independent study

Ingrid Murray, Teacher Support Manager



This session's objectives:

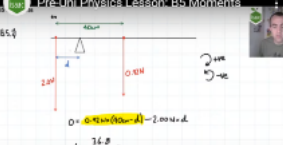
- › By the end of the session, you should be able to:
- › **Locate** the remote learning material quickly by a variety of routes
- › Feel familiar with the **layout** of the lessons for GCSE and A Level
- › Use the lessons for **live teaching**
- › Use the lessons for **independent study**
- › Use the **revision lessons**
- › **View your students' progress** in assignments and live lessons
- › ***You will be guided to explore the resources on Isaac for remote learning and ask questions by unmuting or via the chat function.***



Lessons for Remote Learning



Pre-Unit Physics Lesson: B5 Moments



Lessons for remote COVID-19 learning

Packaged by topic and ready for self-learning or teaching. Virtual lessons blending into videos, explanations, auto-marked questions and tutorials.

[Read more](#)

A Level*
Concept
Lessons

A Level*
Revision

GCSE
Live Lessons

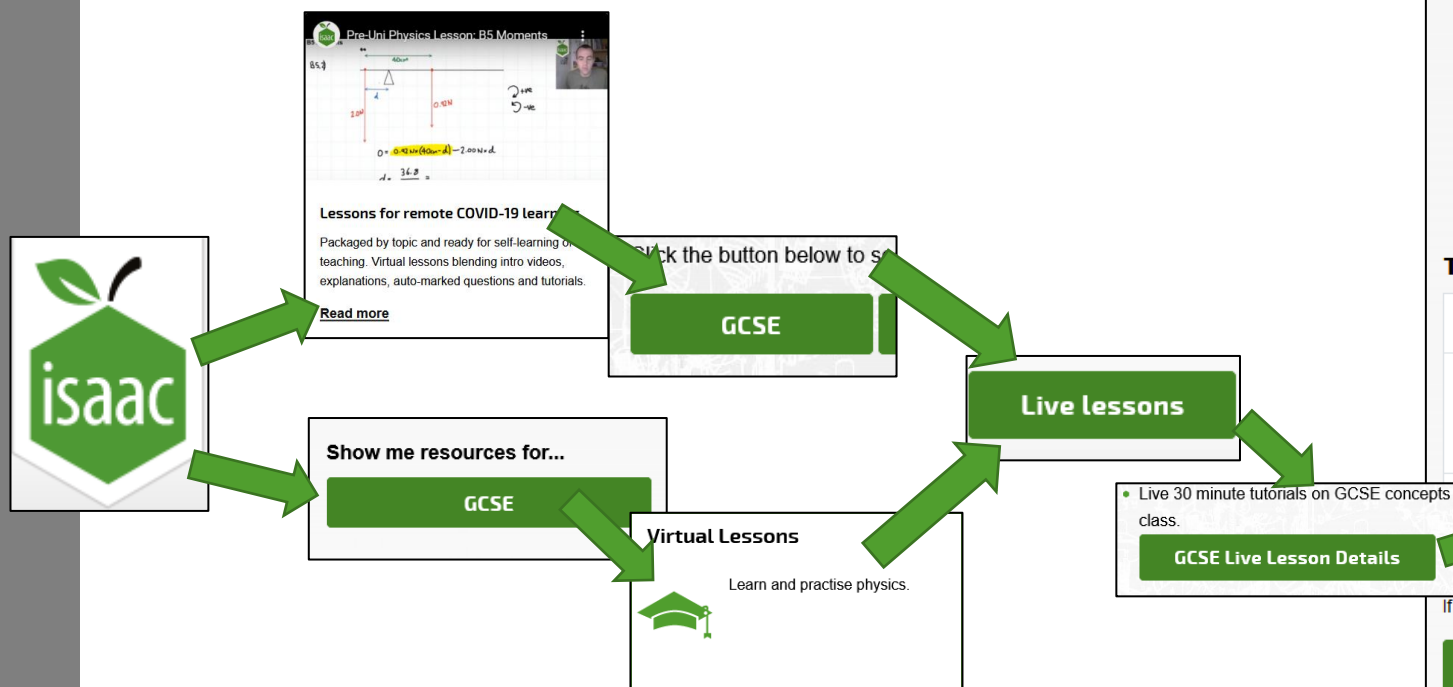
GCSE
Concept
Lessons

GCSE
Revision

*or equivalent



GCSE Live Lessons



Virtual weekly lessons to support GCSE students during school closures.

- The lessons will be based around our [Mastering Essential GCSE Physics book](#).
- Once a week, we will post one or two videos explaining the topic for that day.
- Then set some practice questions to do.
- As students work on questions throughout the day, they can send us questions using the text box in the tutorial section
- Questions will then be answered the following morning during a live tutorial
- Previous lessons are available [on our archive](#). You can fast forward through them!

Timetable

Wednesdays		Thursdays	
9:00am	Post the online video introducing the topic and an assignment is set	12:30pm	30-minute live tutorial responding to previous day's questions and going through a problem or two
Throughout the day	Students work on problems set and submit questions	1:30pm	Further practice questions set

If a tutorial is coming up, click here:

[It's Thursday! Join tutorial](#)

This week

Date	Notes on the Topic	Intro Videos	Homework/ Assignment	Extension Work	Online Tutorial
4th Feb	19. Introducing Momentum and	19.1 Introducing	19.1 Introducing Momentum and		Live tutorial will be on the

https://isaacphysics.org/pages/covid19_gcse



How students use GCSE Live Lessons

- › For **automatic** homework, join group
<https://isaacphysics.org/account?authToken=KTUKXP>
- › Every Wednesday:
 - Link appears to introduction videos
 - **Automatic:** at 9am, homework appears in their *My Assignments* page
 - **Manual:** Link to homework
 - Stuck? Log in and submit questions (click *It's Thursday!*, enter username...)
- › Every Thursday 12:30pm:
 - Join the live tutorial from the page (click *It's Thursday!* then play the video)
 - They can ask questions & get response live!
 - Extension exercise afterwards
 - If they miss the lesson, it stays there until Monday (and later on the Archive)

If a tutorial is coming up, click here:

It's Thursday! Join tutorial

This week

Date	Notes on the Topic	Intro Videos	Homework/ Assignment	Extension Work	Online Tutorial
4th Feb	19. Introducing Momentum and Impulse (notes from GCSE book)	19.1 Introducing Momentum 19.2 Introducing Change in momentum 19.3 Introducing impulse	19.1 Introducing Momentum and Impulse		Live tutorial will be on the Thursday from the tab below

Next week

Date	Notes on the Topic	Intro Videos	Homework/ Assignment	Extension Work	Online Tutorial
11th Feb	20. Momentum Conservation (notes from GCSE book)	Introduction for Section 20. Momentum Conservation	20. Momentum Conservation (questions)		Live tutorial will be on the Thursday from the tab below

Automatically receive homework

To automatically receive the weekly homework assignments:

- click on the group code **KTUKXP**
- grant Isaac Physics permission to see your progress so that we can tailor the tutorials to the group (we don't want to waste time on questions that everyone can do). We can only see these GCSE assignments.
- if you would like to be assigned **all of the 15 previous assignments** (available in the archive tab) then click on the group code **8M9PHC** and this will give you them **all in one go**. Or you can go to the archive and work through them one by one.

Archive

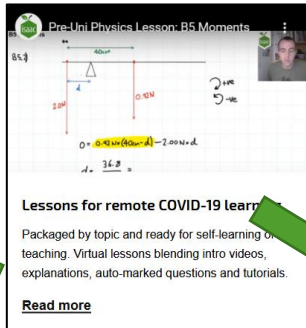
We keep an *archive* of previous lessons. Teachers can set these for their students at any time.

Archive



GCSE Concept Lessons (Archive)

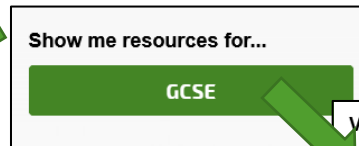
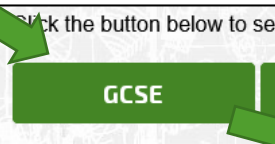
- › Concept lessons (e.g. Refraction)
- › Revision lessons (e.g. Waves and Optics)



Lessons for remote COVID-19 learning

Packaged by topic and ready for self-learning or teaching. Virtual lessons blending into videos, explanations, auto-marked questions and tutorials.

[Read more](#)



Topic revision material **Live lessons** **Online masterclasses**

Energy **Electricity** **Force & Motion** **Matter** **Radioactivity** **Waves and optics**

- 38 [Wave properties and equations](#) ($f = \frac{1}{T}$, $v = f\lambda$)
- 39 [Reflection in plane mirrors](#)
- 42 [Refraction](#)
- 43 [Total internal reflection](#)
- 45 [Seismic waves](#)
- 48 [Convex lenses](#)
- 49 [Concave lenses](#)
- Waves and optics topic revision**

Taking your Physics further:

Choose a topic

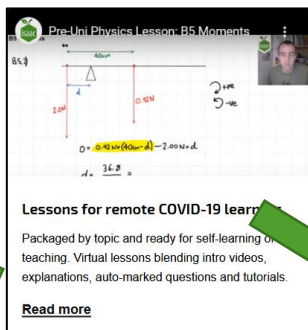
Choose a lesson

https://isaacphysics.org/pages/gcse_topic_index

GCSE Concept Lessons (Old archive)

- › One lesson for each section of our GCSE book
 - Green: live tutorial already available
 - Yellow: live tutorial coming soon

https://isaacphysics.org/pages/covid19_gcse_archive



Click the button below to see

GCSE

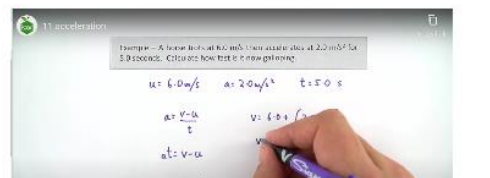
Show me resources for...

GCSE

Virtual Lessons

Learn and practise physics.

Remote lesson information in previous, table format

[illegible]



How to set GCSE Concept Lessons

- › Give your students a direct section link, e.g.
https://isaacphysics.org/pages/covid19_gcse_archive#22
- › *Tip: To monitor students' progress, duplicate the interactive board & set it to your group!*

The screenshot displays the '22. Charge and Current' section of the Isaac Physics website. Red arrows and text boxes provide instructions for setting up lessons:

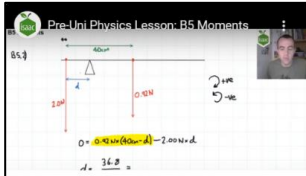
- 1. Watch the introduction video(s)**: Points to the 'Introduction 1' button in the 'Videos' section.
- 2. Try the questions (pdf or interactive format)**: Points to the 'Questions (pdf)' and 'Questions (interactive)' buttons.
- 3. Read more**: Points to the 'Concepts' button.
- 4. Watch tutorial for solutions of the toughest problems**: Points to the 'Tutorial' button.
- 5. Extension for higher achievers**: Points to the 'Extension Work' button.

The 'Videos' section shows a video player for '22.1 charge and current' with the title 'Mastering Essential GCSE Physics' and the equation $Q = It$.



GCSE Revision Lessons

› Revise a large topic, more quickly



Lessons for remote COVID-19 learning

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[Read more](#)

Click the button below to see

GCSE

Show me resources for...

GCSE

Virtual Lessons

Learn and practise physics.

Topic revision material

- [Electricity revision](#)
- [Energy revision](#)
- [Matter revision](#)
- [Force & Motion revision](#)
- [Radioactivity revision](#)
- [Waves revision](#)
- [Electromagnetism revision](#)

https://isaacphysics.org/pages/remote_revision_gcse

Energy

Video presentation

GCSE Energy Revision - Summary and Questions
Work and the joule

Not all forces require fuel. Those that do involve motion. The energy transfer caused by the force is called the work done.

Work done = Force x distance moved
in the force's direction

As the same energy is gained by one object and lost by the other, the total amount of energy does not change.

Watch on YouTube

Images courtesy of pexels.com (copyright free)

Summary | [Answers](#) | [Q & A](#) | [Resources](#)

Know your energy formulae

Name of store	Formula	Depends on	Book section
All	Energy $E = Fd$	F = force (N) d = distance moved	33



How to use GCSE Revision Lessons

- › Give your students a direct section link, e.g.
https://isaacphysics.org/pages/remote_revision_gcse#force_motion

Video presentation

GCSE Force and Motion - Summary and Questions

Displacement – time graphs

Graph shows distance of object from the starting point at each moment in time.

Force and Motion is a large topic, and this video is 66 minutes long. If you only need one section, you may wish to fast forward to the points listed here:

Topic	Time (mm:ss)	Topic	Time (h:mm:ss)
Vectors	0:00	Momentum	38:27
Velocity and acceleration	4:03	Road physics	49:25
Motion graphs	12:41	Moments	56:36

1. Revision video with built-in exercises

3. Summary of facts and equations

4. Answer videos for each exercise

2. Skip to a topic

Questions or comments? Contact us

Summary | [Answers](#) | [Q & A](#) | [Resources](#)

Vectors, like velocity, displacement and force have magnitude (size) and also direction
Scalars, like mass, time, distance and speed only have magnitude
To add vectors, draw the arrows to scale for example $2\text{ N} \rightarrow 1\text{ cm}$, and join them **nose to tail**

[Summary](#) | **Answers** | [Q & A](#) | [Resources](#)

Contents

The videos below are worked solutions to the practice questions:

- Vectors
- Acceleration
- $s-t$ graphs
- $v-t$ graphs
- Constant acceleration
- Resultant force
- Drag
- Momentum
- Moments
- Springs

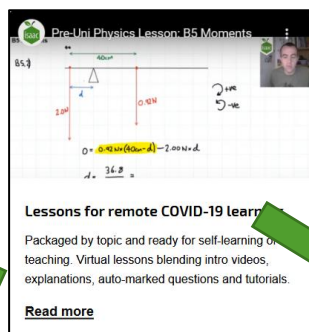
Vectors

GCSE Force and Motion Answer 1 - Vectors



GCSE Online Masterclasses

- › Live events (~1/month) aimed at one year group



Lessons for remote COVID-19 learning
Packaged by topic and ready for self-learning or teaching. Virtual lessons blending into videos, explanations, auto-marked questions and tutorials.
[Read more](#)

Click the button below to see
GCSE

Show me resources for...
GCSE


Virtual Lessons
Learn and practise physics.

Online masterclasses

Timetable		
Masterclass	Date	Topic
Year 10 Masterclass	12th December 2020	Energy, electricity and vectors
Year 11 Masterclass	27th February 2021	Force and motion, pressure, and optics
Year 10 Masterclass	13th March 2021	Circuits, thermal physics and introduction to radioactivity
Year 11 Masterclass	24th April 2021	Electromagnetism, nuclear reactions, proportionality and practical

Y10 Physics Virtual Masterclass


3 hour event to practise GCSE Physics



When: Sat, 22 May 2021, 10:00 — 13:00

Availability: 139 spaces
- Waiting list booking is available!

Booking Deadline: Fri, 14 May 2021, 11:59



Add to Calendar

Y10 Physics Virtual Masterclass

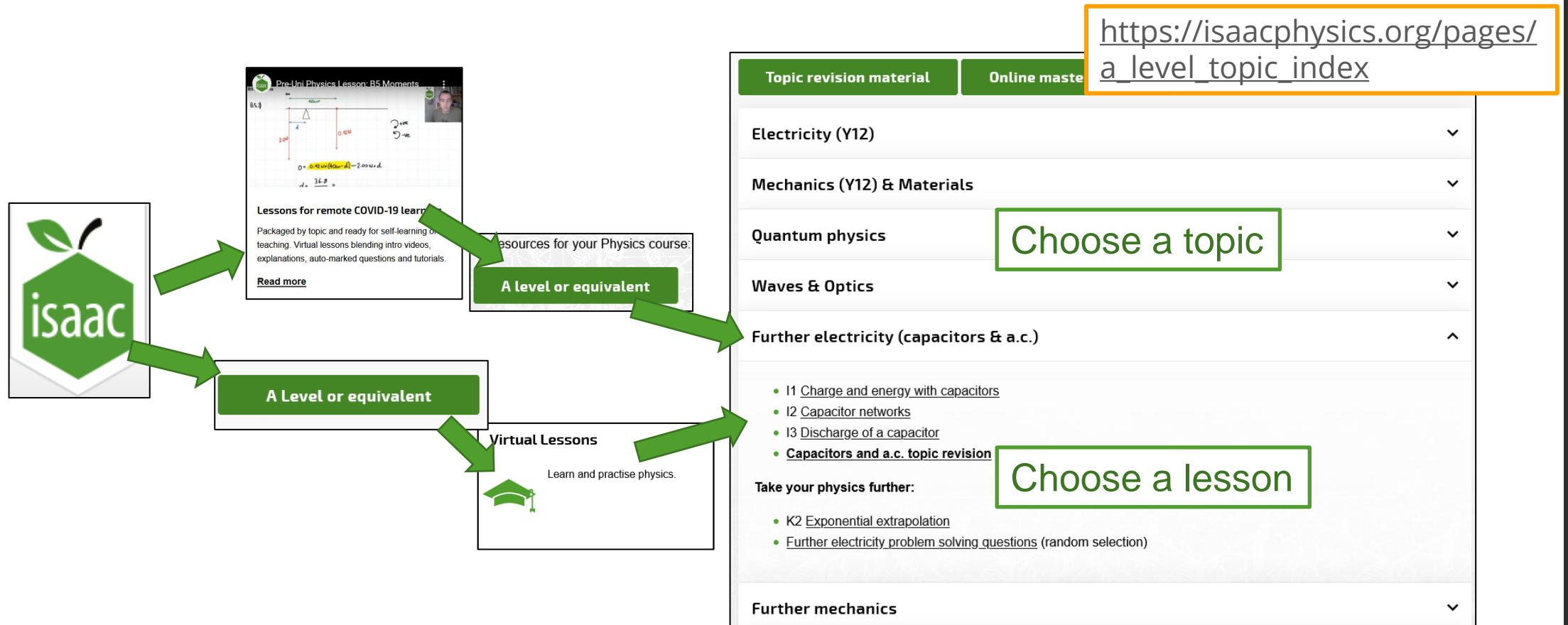
Event details

This **free** 3 hour masterclass will be an **intense workout** to practise the physics concepts that you **will** need to get good grades in your GCSE exams. The masterclass will be delivered online via Zoom. You will revise 3 topics by watching an introductory video and trying questions in small groups with a tutor.



A Level Concept Lessons

- › Concept lessons (e.g. Capacitor discharge)
- › Revision lessons (e.g. Further Electricity)

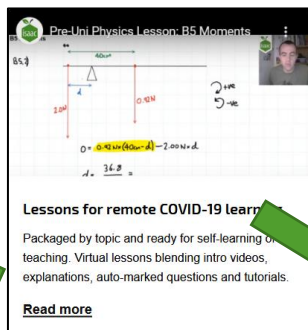




A Level Concept Lessons (Old archive)

- › One lesson for each section of our pre-university Physics book
 - Tutorials available for all sections!

https://isaacphysics.org/pages/covid19_alevel_archive

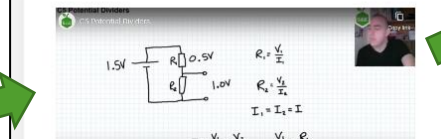


Resources for your Physics course:
A level or equivalent

A Level or equivalent

Virtual Lessons
Learn and practise physics.

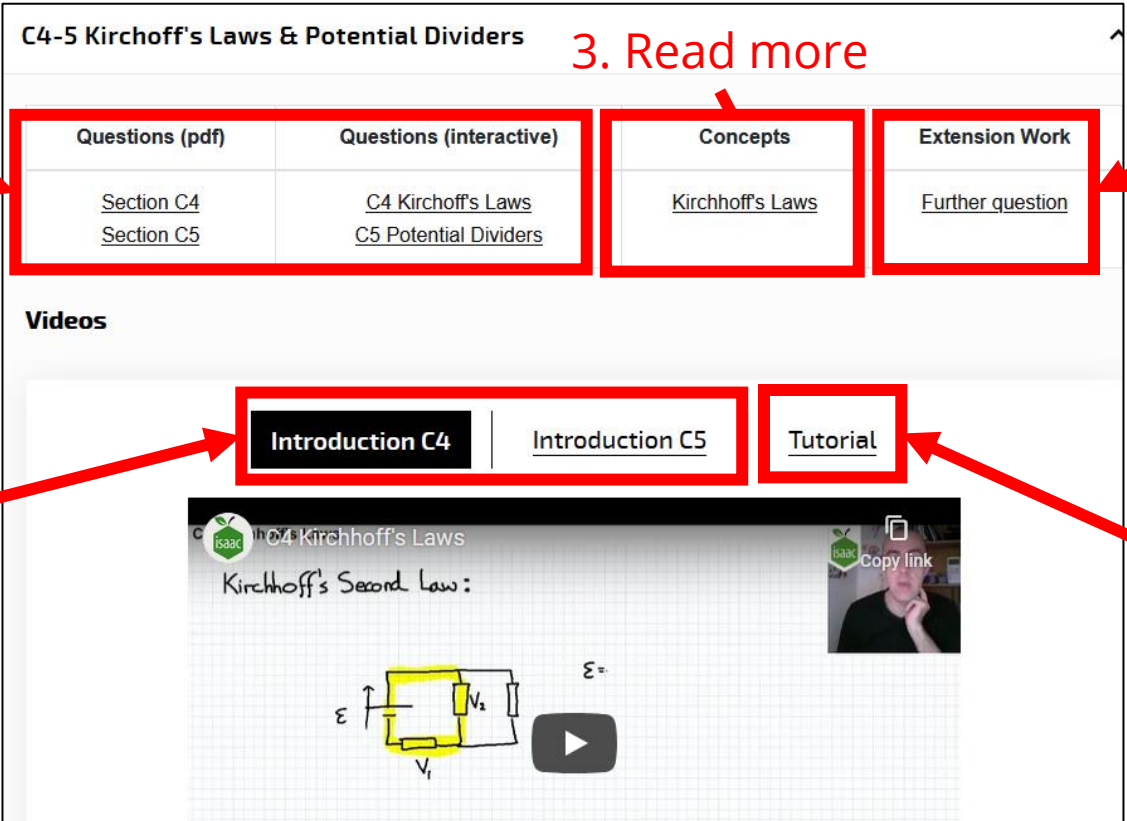
Remote lesson information in previous, table format



A - General Questions	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
B - Mechanics	B1	B2	B3	B4	B5	B6	B7	B8	B9	
C - Electric Circuits	C1	C2	C3	C4	C5	C6				
D - Waves	D1	D2	D3	D4	D5	D6	D7	D8	D9	
E - Uncertainties	E1	E2	E3	E4						
F - Mechanics	F1	F2	F3	F4	F5	F6	F7			
G - Systems and Thermal Physics	G1	G2	G3	G4						
H - Fields	H1	H2	H3	H4	H5	H6	H7	H8	H9	
I - Capacitors	I1	I2	I3							
J - Nuclear	J1	J2	J3	J4						

How to set A Level Concept Lessons

- › Give your students a direct section link, e.g.
https://isaacphysics.org/pages/covid19_alevel_archive#22
- › *Tip: To monitor students' progress, duplicate the interactive board & set it to your group!*



The screenshot shows the Isaac Physics interface for the topic 'C4-5 Kirchhoff's Laws & Potential Dividers'. The interface is divided into several sections, with red boxes and arrows highlighting specific features:

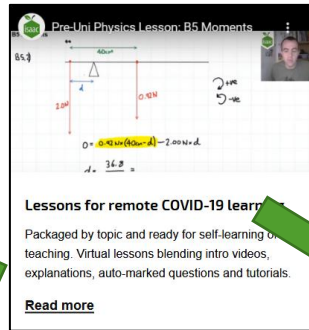
- 1. Watch the introduction video(s)**: Points to the 'Introduction C4' button in the 'Videos' section.
- 2. Try the questions (pdf or interactive format)**: Points to the 'Questions (pdf)' and 'Questions (interactive)' buttons.
- 3. Read more**: Points to the 'Concepts' button.
- 4. Watch tutorial for solutions of the toughest problems**: Points to the 'Tutorial' button.
- 5. Extension for higher achievers**: Points to the 'Extension Work' button.

The 'Questions (pdf)' section lists 'Section C4' and 'Section C5'. The 'Questions (interactive)' section lists 'C4 Kirchhoff's Laws' and 'C5 Potential Dividers'. The 'Concepts' section lists 'Kirchhoff's Laws'. The 'Extension Work' section lists 'Further question'. The 'Videos' section shows a video player with the title 'C4 Kirchhoff's Laws' and a thumbnail image of a circuit diagram with a battery, a variable resistor, and two voltmeters (V_1 and V_2). The video player also shows the text 'Kirchhoff's Second Law:' and a 'Copy link' button.



A Level Revision Lessons

› Revise a large topic, more quickly



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[Read more](#)

Resources for your Physics course:

A level or equivalent

A Level or equivalent

Virtual Lessons

Learn and practise physics.

Topic revision material

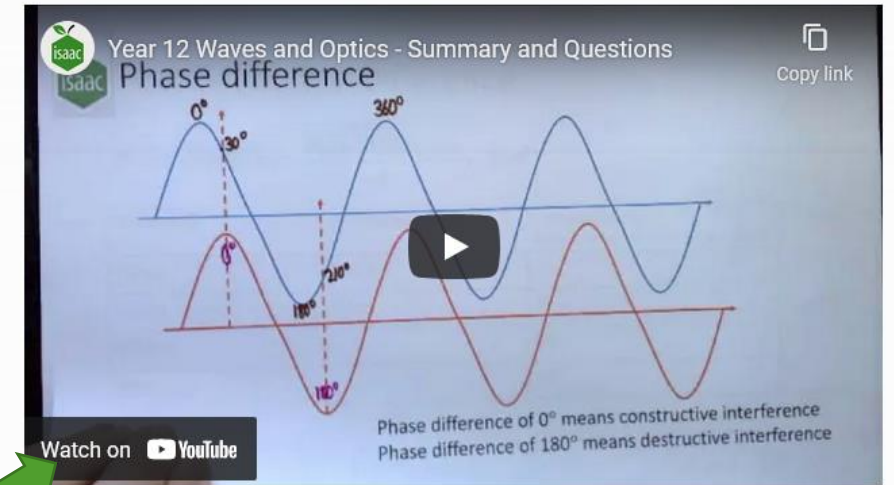
- [Electricity \(Y12\) revision](#)
- [Mechanics \(Y12\) revision](#)
- [Quantum physics revision](#)
- [Waves & Optics revision](#)

- [Further electricity revision](#) (a.c)
- [Further mechanics revision](#) (circular)
- [Fields revision](#)
- [Thermal physics revision](#)
- [Nuclear physics revision](#)

https://isaacphysics.org/pages/remote_revision_alevel

Waves and optics

Video presentation



Watch on YouTube

[Summary](#)

[Answers](#)

[Q & A](#)

[Resources](#)

Wave equations

Speed c (m s^{-1}) = Wavelength λ (m) \times Frequency f (Hz)

Frequency f (Hz) = $1 \div$ Time period T (s)

For wave on string, speed given by $c = \sqrt{T/\rho}$ where T is the tension (N) and ρ is the linear density of the string (kg m^{-1})

Phase and path difference

ΔL



How to use A Level Revision Lessons

- › Give your students a direct section link, e.g.
https://isaacphysics.org/pages/remote_revision_alevel#fields

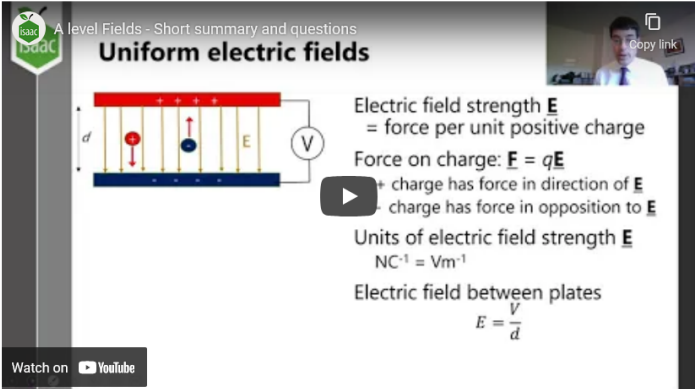
Link for Demo

Fields

Video presentation

[Short version \(26m\)](#) | [Long version \(1h31m\)](#)

This video is a brief summary of the most important points. For more detail, watch the long version.



A level Fields - Short summary and questions


Uniform electric fields

Electric field strength E
= force per unit positive charge

Force on charge: $F = qE$
+ charge has force in direction of E
- charge has force in opposition to E

Units of electric field strength E
 $NC^{-1} = Vm^{-1}$

Electric field between plates
 $E = \frac{V}{d}$

Watch on  YouTube

Fields is a large topic, and this video is 26 minutes long. If you only need one section, you may wish to fast forward to the points listed here:

Topic	Time (mm:ss)	Topic	Time (mm:ss)
Uniform electric fields	1:19	Magnetism overview and magnetic flux density	12:59
Radial gravitational fields	3:54	Magnetic flux and linkage	17:04
Radial gravitational potential	7:04	Electromagnetic induction	18:58
Radial electric fields	10:15	Transformers	22:34



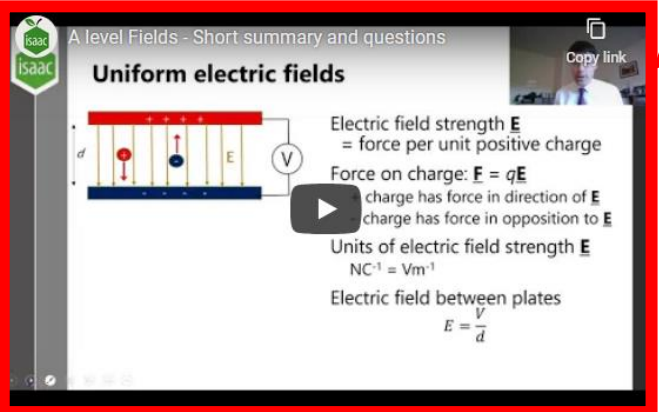
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1. Revision video with built-in exercises

3. Summary of facts and equations

4. Answer videos for each exercise

2. Skip to a topic

Summary | [Answers](#) | [Q & A](#) | [Resources](#)

Uniform electric fields

Force F (N) on a charge q (C) in electric field E is

$$F = qE$$

so electric field strength E is measured in NC^{-1} equivalent to Vm^{-1}


[Summary](#) | **Answers** | [Q & A](#) | [Resources](#)

Contents

The videos below are worked solutions to the practice questions:

- Uniform E-fields
- Gravitational field
- Gravitational potential
- Radial E-fields
- Radial electric potential
- Flux density
- Electromagnetic induction
- Transformers

Uniform E-fields



A level Fields Answer 1 - Uniform E-fields

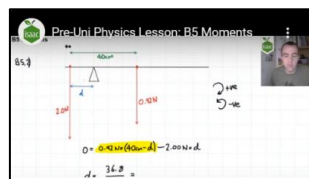
Uniform electric field practice

Questions or comments? Contact us



A Level Online Masterclasses

- › Live events (~2/month) aimed at one year group



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Resources for your Physics course:

A level or equivalent

A Level or equivalent

Virtual Lessons


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Online masterclasses

Timetable		
Masterclass	Date	Topic
Year 13 Masterclass	5th December 2020	Momentum and circular motion
Years 12 & 13 Masterclass	6th February 2021	Electricity
Year 12 & 13 Mini-masterclass	20th February 2021	Electricity
Year 12 & 13 Mini-masterclass	20th March 2021	Waves & Optics
Year 13 Masterclass	8th May 2021	Fields

Year 13 Physics Masterclass

Virtual event to practise A Level Physics



When: Sat, 8 May 2021, 09:30 — 14:00

Availability: 408 spaces

Booking Deadline: Fri, 7 May 2021, 12:00

Event details

This **free** masterclass will be an **intense workout** to practise the physics concepts that you will need to get good grades in your A Level exams. The masterclass will be delivered online as a Zoom webinar. You will revise Mastering Pre-University Physics Chapter F Mechanics (Gravitational Fields)

Year 13 Physics Masterclass

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Add to Calendar



Thank you for attending this CPD!

- › Need support?
- › Isaac help videos:
https://www.youtube.com/playlist?list=PL9UgBEOgmdZX4Wf24_HiXgIjBNlu-NQu
- › <https://isaacphysics.org/contact> anyone able to help will pick this up
- › [ingrid@isaacphysics.org/](mailto:ingrid@isaacphysics.org) goes to Teacher Manager only
- › <https://www.talkphysics.org/groups/isaac-physics/> an Isaac community
- › Apply to join our WhatsApp community:
<https://isaacphysics.org/support/teacher/suggestions>
- › Select "Connect to other teachers who use Isaac"