Karen Hill - My experience

Imperial College London

The Open University

The Ogden Trust

Making physics matter

Physics. You work it out.

My experience

Imperial College London

A long long time ago…..

Physics A levels at a Girls Grammar School
BSc Physics, PhD Theoretical Physics and 2 years post-doc at Imperial College

My experience

Imperial College London

The Open University

The life of an Academic- Theoretical and Quantum optics

Discovered teaching!

My experience

More than 25 years teaching Physics (11-18) at 4 different schools

3 out of 4 schools for Girls

My experience

Since 2010: Head of Physics at West Kirby Grammar School

Ogden Teacher Fellow

Isaac Physics Ambassador

The Ogden Trust

Making physics matter

isaac

Physics. You work it out.

Overcoming Hurdles

Students

- Too hard!
- IP doesn’t work on my computer
- I did the assignment but it didn’t save it!

Overcoming Hurdles

Students

- Too hard!
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- Book a computer room for first session
- Make sure students know how to log in
- Make sure students agree to their teacher connections
- Start small – edit existing boards to make them easier or to reduce the number of questions

Overcoming Hurdles

Teachers

- Too hard!
- I prefer to use Exampro.

Overcoming Hurdles

Teachers

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Point out

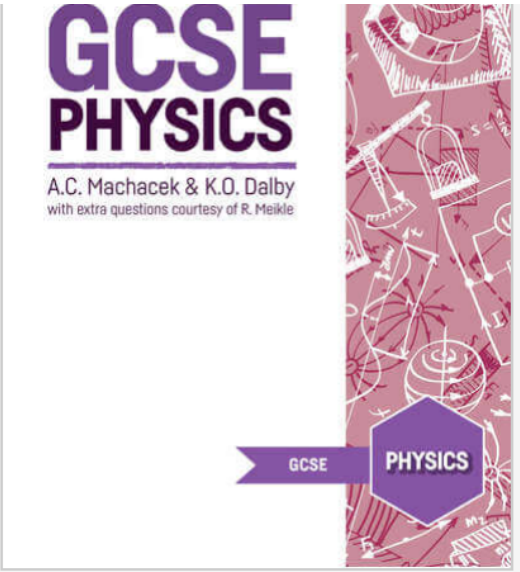
- where the guides are on the website
- How to contact the helpdesk for hints
- The value of teachers getting it wrong
- Email you with a screenshot to trouble shoot

- Put it into your SoW as a key assessed piece of work

Includes worked examples and guidance.

GCSE grades 9-4/5.

Includes extension materials (beyond GCSE, indicated by ♡)



Lessons for remote COVID-19 learning

Virtual lessons following the Mastering Essential GCSE Physics book.

Virtual lessons by topic

Buy the book

Printed copies, cost price £1 (plus p+p)

Buy Isaac Books

For Teachers

Specification Table - maps the book to your exam board.

Teacher Guidance Notes - by A. Machacek, K. Dalby, A Davies.

MY ACCOUNT

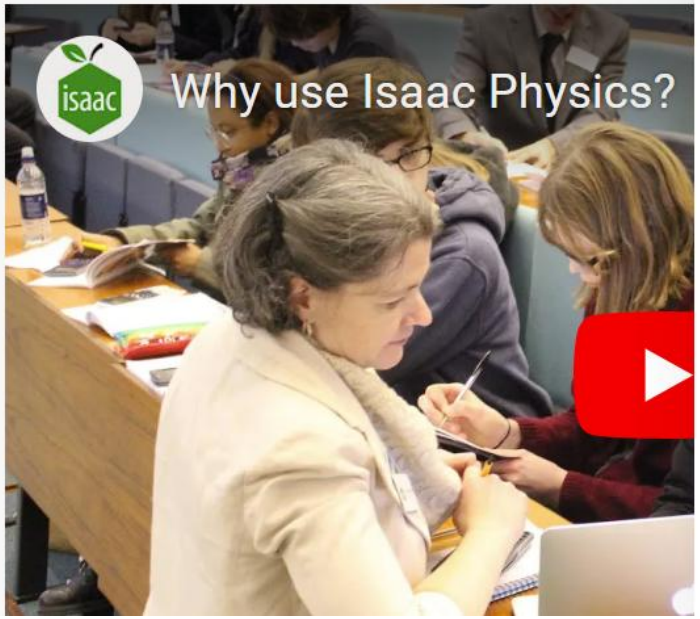
My Isaac 2 | Teach | Learn | Events | Help

Master Physics by Solving Problems:

from School to University!

Welcome to Isaac Physics, the free platform for teachers and students.

- Use it in the **classroom**
- Use it for **homework**
- Use it for **revision**



How-to Videos

Problem Solving Guide

Student FAQ

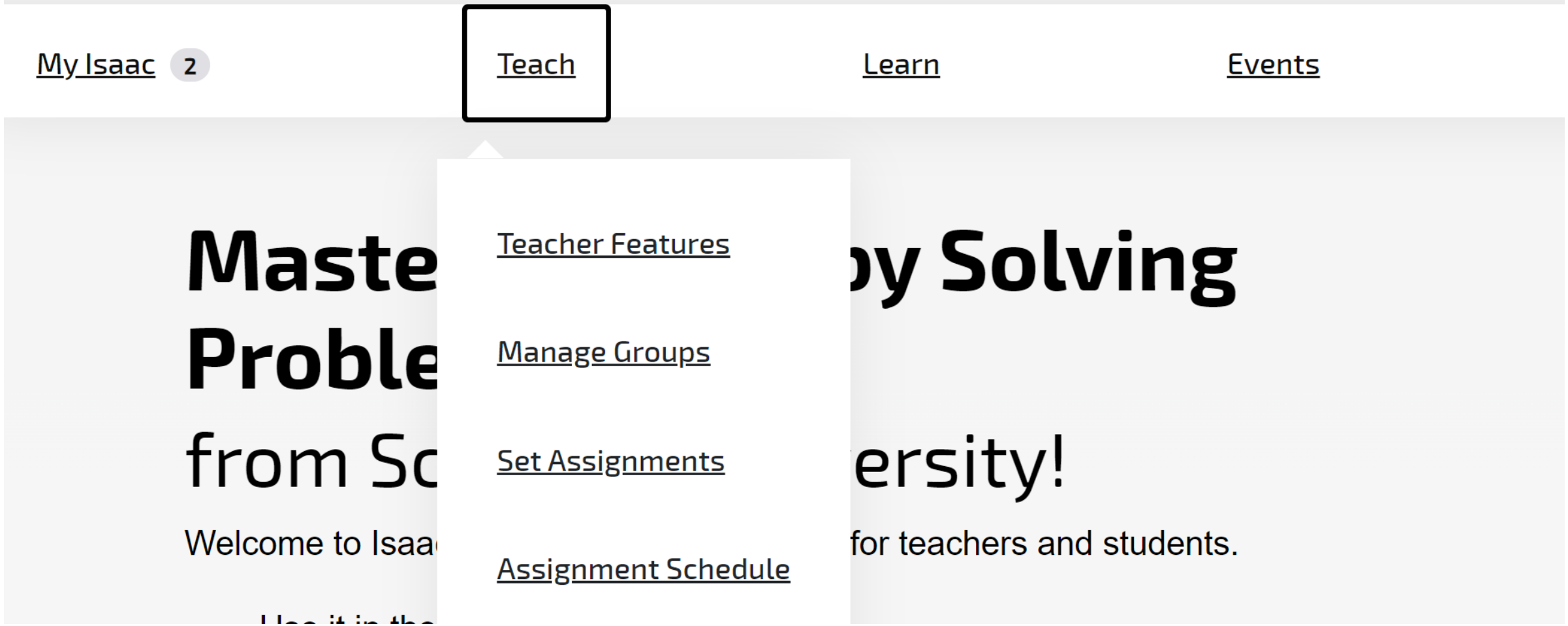
Teacher FAQ

Contact Us

Embedding Isaac Physics into SoW

- Our SoW takes the form of **a curriculum Map**.
- Each topic or unit of work has a **Context Sheet**.
- The Context sheet is for the students (and parents) and outlines the knowledge and skill areas taught. It also states key pieces of assessed work that must be done for every group – i.e. **common assessments**.
- I have put IP boards onto each Context Sheet to ensure every teacher and every student engages fully with it.
- I make sure I am **a co-teacher with each class on IP** so I can access/monitor all data.

Adding teachers to classes



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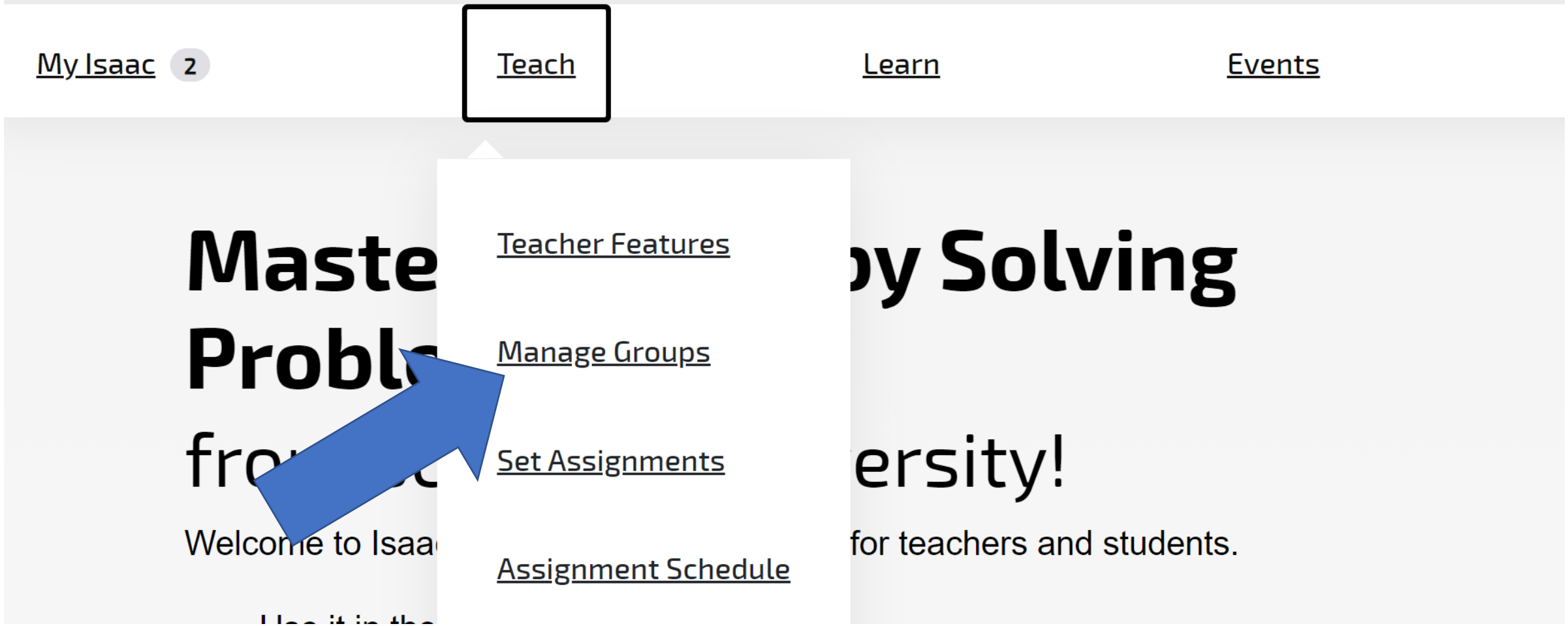

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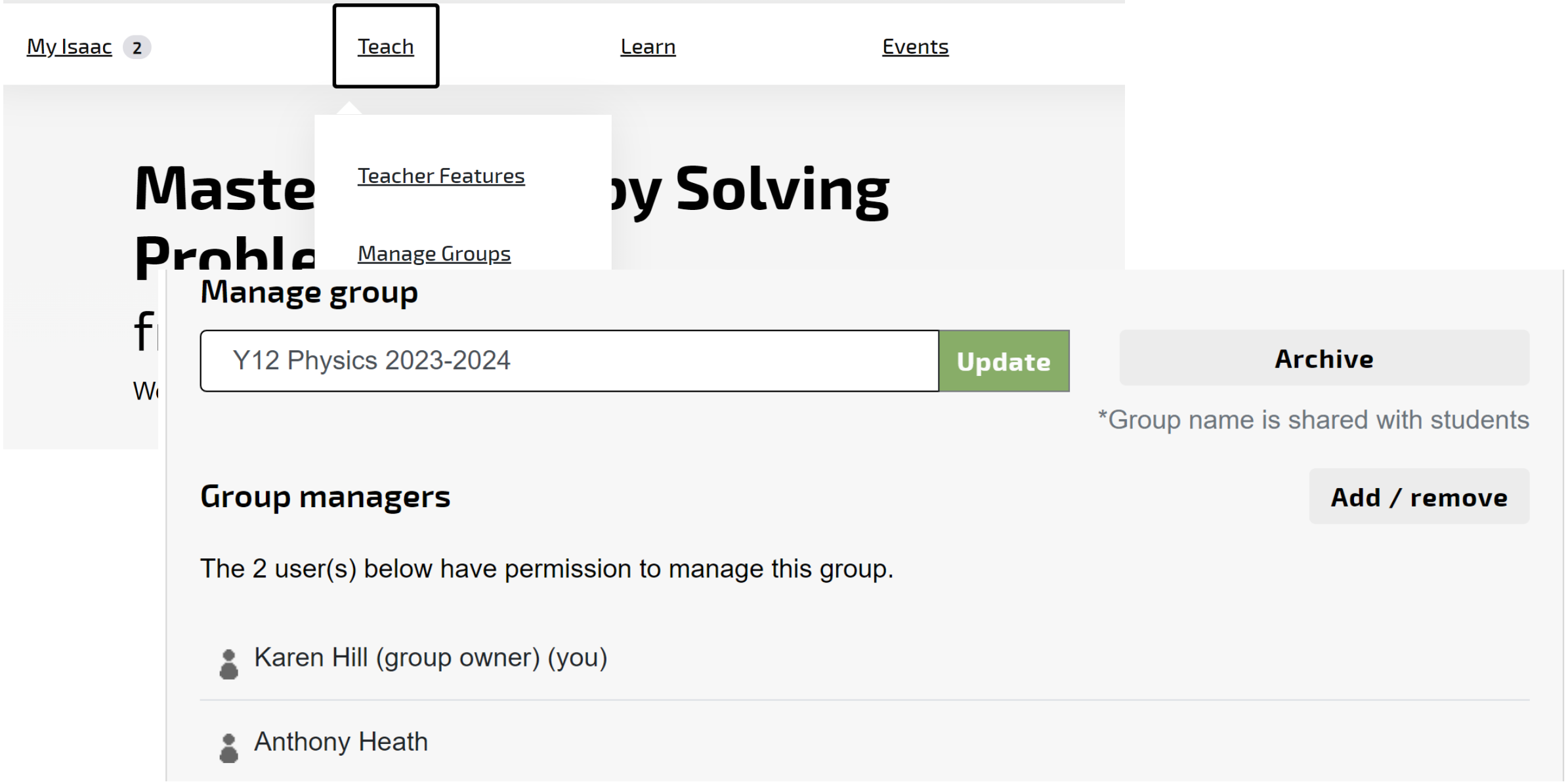

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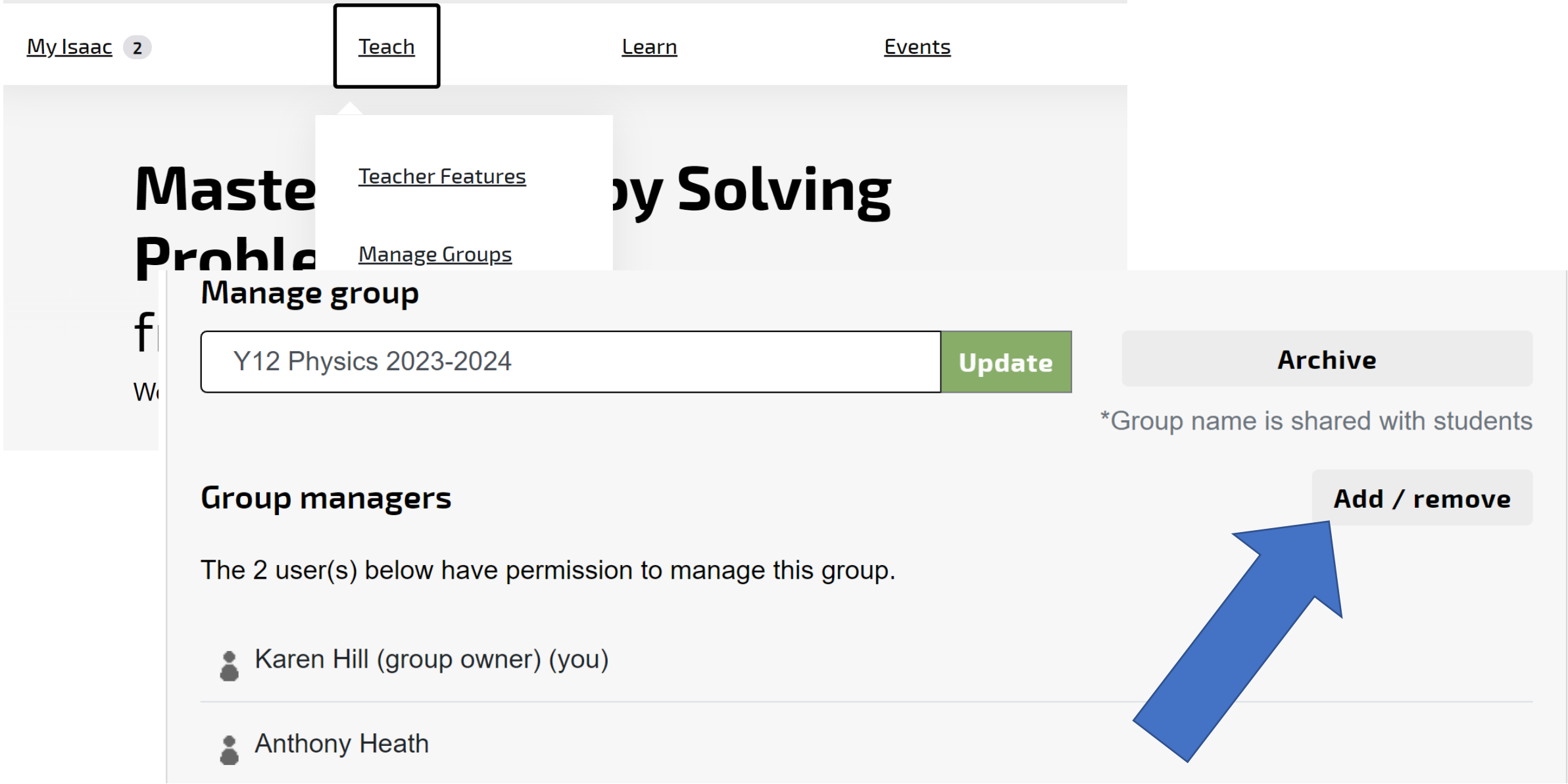


GCSE Physics Topic 1 Waves

Learning about waves is important because: We rely on light and sound to communicate with other people not just near to us, but all around the world, so it is important for us to understand how this works and what other uses light and sound have that we may not have thought about. But these are not the only waves that are important to us. Visible light is just a tiny part of a much wider spectrum of waves called the electromagnetic spectrum. From radio waves and microwaves to gamma and x-rays, waves play a key part in how we live our lives.

This builds on: In Y5 or 6 you learned how the fact that light travels in straight lines is used to explain why we see shadows. In Y7 or 8 you will have learnt about Light and Sound, discovering how they are made, how they travel and how they are detected. You learned how waves are reflected and refracted and used this to understand how lenses work. You learned that white light is a mixture of colours and found out why objects look different colours in coloured lights.

This leads to:

In Y11, you will learn more about how light can be bent through lenses to help us see better, for example, in glasses to correct vision and in microscopes. You will also learn how our knowledge of the electromagnetic spectrum has helped us to understand the properties of stars and galaxies and what this tells us about the very beginnings of our Universe.

We will learn:

1. → Describing Waves with numbers
2. → Waves and time
3. → Interfering waves—superposition
4. → The wave equation
5. → Investigating ripples
6. → Sound and ultrasound
7. → Seismic waves
8. → Beyond the visible
9. → The electromagnetic spectrum

We will develop/practise skills including:

Practical skills and teamwork by investigating factors that affect the speed of a wave and learning how to measure frequency and wavelength accurately.

Maths skills by

- → practising and rearranging the equations for frequency and wave speed
- → learning how to deal with numbers that are very large or very small by introducing you to standard form and converting units.

Some of the vocabulary that we will use includes:

Frequency, wavelength, amplitude, time period, wave, transverse, longitudinal, compression, rarefaction, electromagnetic wave, superposition, vacuum, ionising, absorption, transmission, reflection, refraction, ultraviolet, infrared, ionising, seismic waves, ultrasound, infrasound

You could learn more about this topic by:

Read: ··Expla… Understanding waves and wavelengths | Science News for Stude…

Visit: Im… Liverpool! Family day out Liverpool | Imagine That! Science and Disco…

W… How to measure the speed of light --- with CHOCOLATE! | Do Try This … The Curious --- YouTube

Your teacher will assess your knowledge & understanding throughout the … looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are:

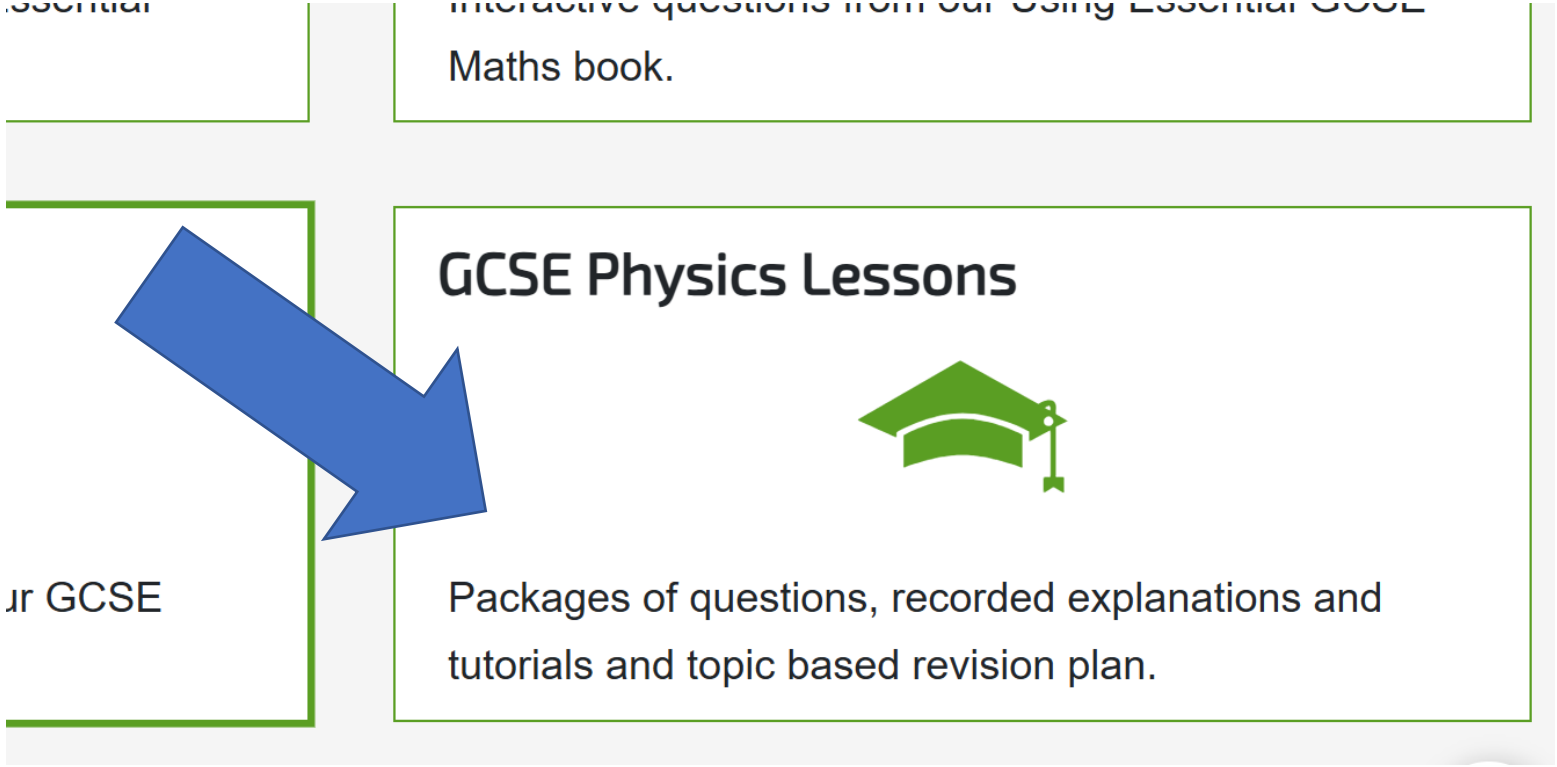
Lesson 4 P6: Frequency and Time Period Calculations — Isaac Physics

Lesson 5 Investigating ripples (GCSE required practical)

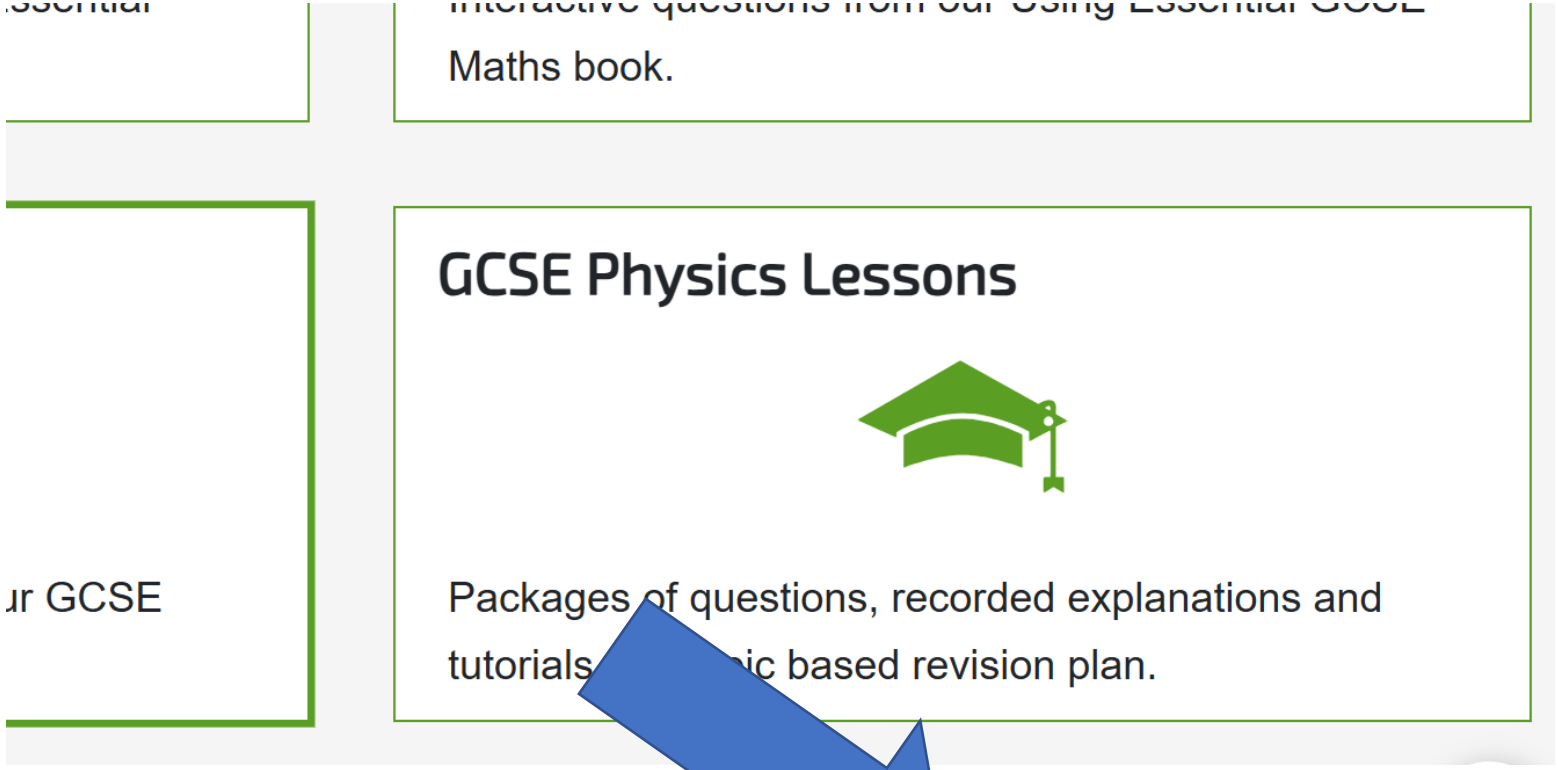
Physics Waves Assessment

Useful Features

Consolidation Programme



Consolidation Programme



Click the button below to see resources for your Physics course:

Year 10 Trilogy | Year 10 Separate Physics

Year 11 Trilogy | Year 11 Separate Physics

Year 12 Physics | Year 13 Physics

If you are a registered Isaac Physics teacher, and wish to set the assignments to your class, then click t

Teacher Features

The resources are in three parts for each topic

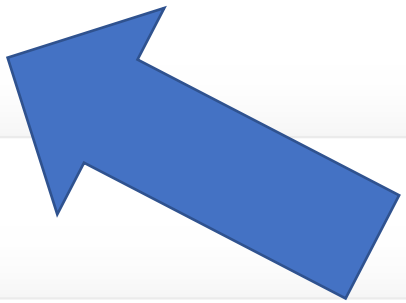
1 Baseline: a set of questions from our book so you can identify whether you are ready for the test or whether a brush up is needed, and if so, which concepts need review. You can see your progress with these questions in My Assignments.

2 Revise: links to our concept learning and topic revision pages to help you review your learning, and

3 Test: a test for you to do at the end to demonstrate your progress.

Test results and feedback are found under 'Completed Tests' in your Tests page.

Please note that if you do a test set to you by a teacher, then you will not receive marks and feedback until the teacher wishes you to see this information.



Energy

Electricity

Internal energy, gases and density

Motion

Energy

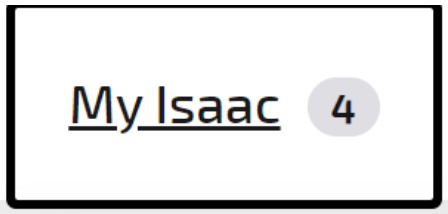
1 Ten Baseline questions on Energy to assess your understanding of the topic.
Have a go at these questions first, so that you can focus your revision on the areas which most need it.

2 Energy revision video with practice questions and worked solutions

Revision resources on individual concepts (concept video, practice assignment & tutorial video showing how to answer the questions) are listed below. Numbers refer to sections of the GCSE Workbook.

- 30 Thermal energy and heat capacity $(E = mc\,\Delta T)$
- 32 Payback times
- 33 Work, gravitational potential energy and power $(E = Fs,\ E = Pt,\ E = mgh)$
- 34 Kinetic energy $\left(E = \frac{1}{2}mv^2\right)$
- 35 Efficiency
- 37 Springs and elastic deformation $\left(F = kx,\ E = \frac{1}{2}kx^2\right)$

3 Topic Test to demonstrate your progress once you have revised this section.



gramme for Year 10

My Account

My Gameboards

My Assignments 3

My Progress

My Tests 1

n Programme for Year 10

consolidate your Year 10 learning in **Separate Science Physics**

click here.

ores in any assignments are stored, make sure that you log on to the Isaac

Home > My Tests

My Tests

Help

In Progress Tests | Completed Tests | Practice Tests

You freely attempted this test.

Instructions

This test is to measure your progress having completed the baseline assessment and the Consolidation Programme.

Overall mark	7 / 9
Section mark breakdown	
Work, potential and kinetic energy	3 / 4
Payback times and efficiency	2 / 3
Heating and springs	2 / 2

Click on a section title or click ‘Next’ to look at your detailed feedback.

A weight-lifter raises a barbell of mass $15\,\mathrm{kg}$, doing $350\,\mathrm{J}$ of work on it. Through what height does he lift the barbell? $g = 10\,\mathrm{N/kg}$

Value

23 !

Units

m

Incorrect

Don't forget g.