



Supporting Learning

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Supporting Learning

➤ Features (9:05)

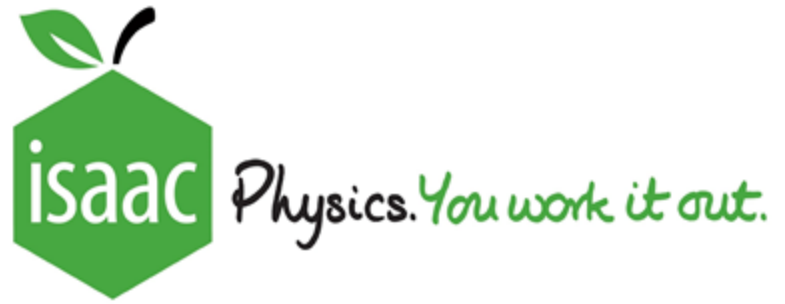
- New question types
- Tests
- Live monitoring of lessons
- Contact us and Question Flags

➤ Content (9:30)

- Boards for Lessons
- Developing connected thinking
- Concept lessons for cover & Revision

➤ Events (9:55)

- Masterclasses
- Senior Physics Challenge
- Mentoring programme



Features

New question types

- Coordinate questions
 - Answer with a pair of numbers
 - Add as many pairs as needed
 - In any order

Find the coordinates of the stationary points of $f(x)$.

(,)

Delete

(,)

Delete

Add coordinate

Check my answer

New question types

➤ In-line questions

- KS3: fill in the boxes
- KS4 & 5: long table questions
- Check all answers in one go (or as you go along)
- Feedback for each part
- Each box is recorded as one question part
- Can be a mixture of quantities and words

A flying duck travels 1000 m in 50 s.

(a) Distance flown in one second = ☒ ÷ ☒ = ☒ metres

(b) Complete the sentence: The duck's speed (in m/s) is ☒.

(c) A seagull flies 90 m in 6 s. Work out its speed using an equation.

$$\begin{array}{ccccccc} \text{Distance (m)} & = & \text{Speed (m/s)} & \times & \text{Time (s)} \\ \hline \text{90} & = & \text{15} & \times & \text{6} \end{array}$$

(d) Work out the speed of a pigeon which flies 440 m in 22 s.

☒ m/s

(e) Work out the speed (in m/s) of a cyclist who travels 5000 m in thirty minutes. Give your answer to one decimal place.

☒ m/s

Partly correct...

You can view feedback for a specific box by either selecting it above, or by using the control panel below.

Previous

Box 7 of 7

Next

The time is given to you in minutes, but we need it in seconds.
How many seconds are there in thirty minutes?



Voltage	Current	Resistance	Power
9.0 V	(a)	300 Ω	(b)
240 V	13 A	(c)	(d)
240 V	(e)	25 Ω	(f)
(g)	100 A	3.0 Ω	(h)
240 V	(i)	(j)	2 500 W
240 V	(k)	(l)	60 W
23 kV	(m)	(n)	23 MW
9.0 V	(o)	22 k Ω	(p)
(q)	30 mA	(r)	0.75 W



Part A	Current (a)	▼
Part B	Power (b)	▼
Part C	Resistance (c)	▼
Part D	Power (d)	▼
Part E	Current (e)	▼
Part F	Power (f)	▼
Part G	Voltage (g)	▼
Part H	Power (h)	▼
Part I	Current (i)	▼
Part J	Resistance (j)	▼
Part K	Current (k)	▼
Part L	Resistance (l)	▼
Part M	Current (m)	▼
Part N	Resistance (n)	▼
Part O	Current (o)	▼
Part P	Power (p)	▼
Part Q	Voltage (q)	▼
Part R	Resistance (r)	▼



Voltage	Current	Resistance	Power
9.0 V	<input type="text"/> Unit...	300 Ω	<input type="text"/> Unit...
240 V	13 A	<input type="text"/> Unit...	<input type="text"/> Unit...
240 V	<input type="text"/> Unit...	25 Ω	<input type="text"/> Unit...
<input type="text"/> Unit...	100 A	3.0 Ω	<input type="text"/> Unit...
240 V	<input type="text"/> Unit...	<input type="text"/> Unit...	2 500 W
240 V	<input type="text"/> Unit...	<input type="text"/> Unit...	60 W
23 kV	<input type="text"/> Unit...	<input type="text"/> Unit...	23 MW
9.0 V	<input type="text"/> Unit...	22 k Ω	<input type="text"/> Unit...
<input type="text"/> Unit...	30 mA	<input type="text"/> Unit...	0.75 W

Check my answer



Cloze text questions

➤ New way to answer questions on mobile



- Dropdown menu to select items instead of drag and drop
- Will reduce need for scrolling

(a) What will happen to a stationary suitcase with balanced forces?

Stay still

(b) What will happen to a moving trolley with balanced forces?

(c) What will happen to a moving trolley with a resultant force pushing forwards (motion)?

Speed up
Slow down
Stay still
Steady speed
Turn

(d) Describe what will happen to a moving trolley with a resultant force pushing backwards (against its motion).

(e) What will happen to a moving trolley with a resultant force pushing it sideways?

Check my answer



Tests

- Informal assessment with delayed feedback



https://isaacphysics.org/set_tests

Teach

[Teacher Features](#)
[Manage Groups](#)
[Set Assignments](#)
[Assignment Schedule](#)
[Assignment Progress](#)
[Set / Manage Tests](#)

Set Tests | [Manage Tests](#)

The following tests are available to set to your groups.

Step Up Energy and Balance Review Test	Set Test	Preview >
Step Up Energy and Balance Review Test (Short)	Set Test	Preview >
Year 10 Energy Test visible to students	Set Test	Preview >
Year 10 Internal Energy, Gases and Density Test visible to students	Set Test	Preview >



Tests: New features 1



- Set a test to multiple groups
- Schedule tests to start at a future date

CLOSE

Setting test 'Biology Challenge 3'

Set test to the following group(s):

Year 12 Class A x Year 12 Class B x Year 12 Class C x x v

What level of feedback should students get:

Select... v

Set an optional start date: ?

7 v September v 2024 v x

Set an optional due date:

v v v x

CloseSet test

Tests: New features 2



➤ View a student's answers!

[Set Tests](#)

Manage Tests

Show filters

1 group

Year 10 Force and Motion Test

Set Test

Group name	Creation date	Start date	Due date	Actions
Year 12 Class A	15/03/2024	15/03/2024	-	<div>View Results</div> <div>More</div>

Amit Student

Allow another attempt

View answers

Bella Student

2 of 4 students have completed the test

Year 10 Force and Motion Test

Hide mark

Question 1

25%	50%	50%	25%	25%	50%
X	✓	✓	X	✓	✓
✓	✓	✓	✓	X	✓



Live monitoring of lessons

- Refresh to update student progress

Teach

[Teacher Features](#)

[Manage Groups](#)

[Set Assignments](#)

[Assignment Schedule](#)

[Assignment Progress](#)

[Set / Manage Tests](#)

Year 12
Class A

8 assignments or tests set [\(Download group assignments CSV\)](#) [\(Download group tests CSV\)](#)

100% correct

≥75% correct

<75% correct

Not attempted

>25% incorrect

Colour-blind ☐ Percent view ☐

Assignments (3)

Tests (5)

1. Mechanics (Copy) (Due: 29/06/2023) View, Download CSV or View individual assignment

2. Mechanics View, Download CSV or View individual assignment

0 of 4 students have completed the assignment [Mechanics](#).

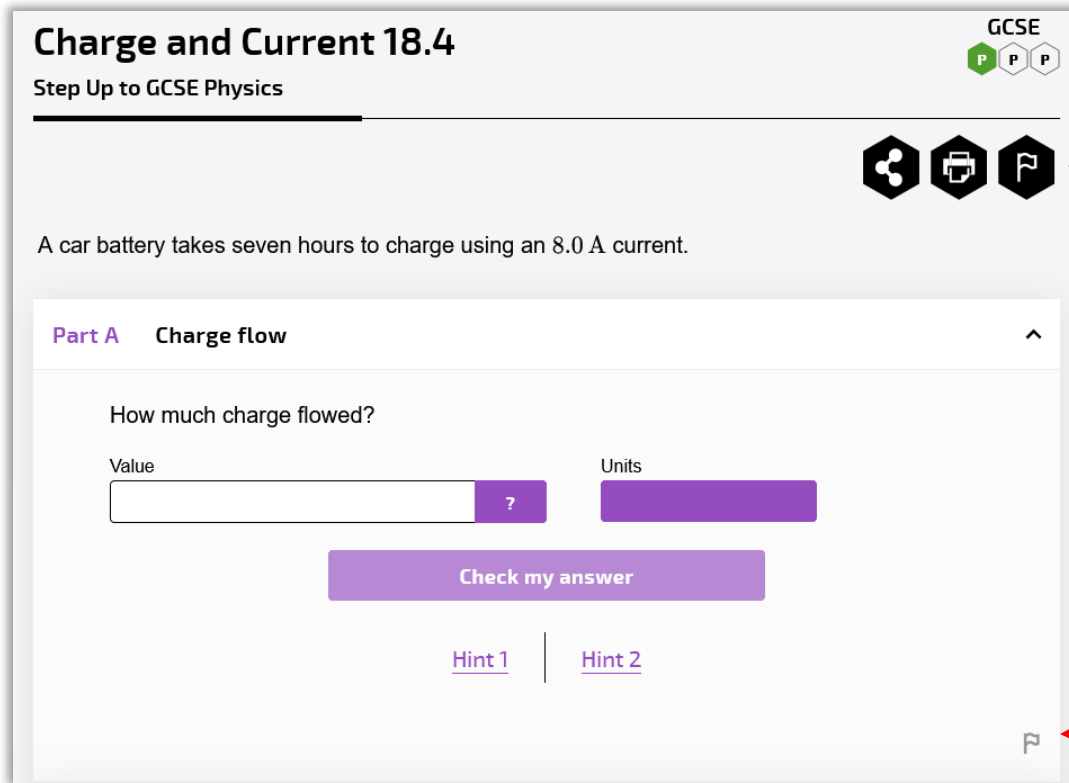
Question: Long Distance Runner

	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	Total Parts
Amit	0/4	0/2	0/1	0/2	0/2	0/2	0/2	0/1	0/6	0/25	0/10
Bella	0/4	0/2	0/1	0/2	0/2	0/2	0/2	0/1	0/6	0/25	0/10

Contact us and question flags



- Questions have links to contact the team
 - Used equally by teachers and students!

A screenshot of a GCSE Physics question interface. At the top, it says 'Charge and Current 18.4' and 'Step Up to GCSE Physics'. There are three icons: a share icon, a print icon, and a flag icon. Below these icons is the text 'A car battery takes seven hours to charge using an 8.0 A current.' The question is titled 'Part A Charge flow'. The question text is 'How much charge flowed?'. There are two input fields: 'Value' and 'Units'. The 'Value' field has a question mark icon. Below the input fields is a 'Check my answer' button. At the bottom, there are two links: 'Hint 1' and 'Hint 2'. A small flag icon is in the bottom right corner of the question area.

ask about a whole question...

...or just one part



Content

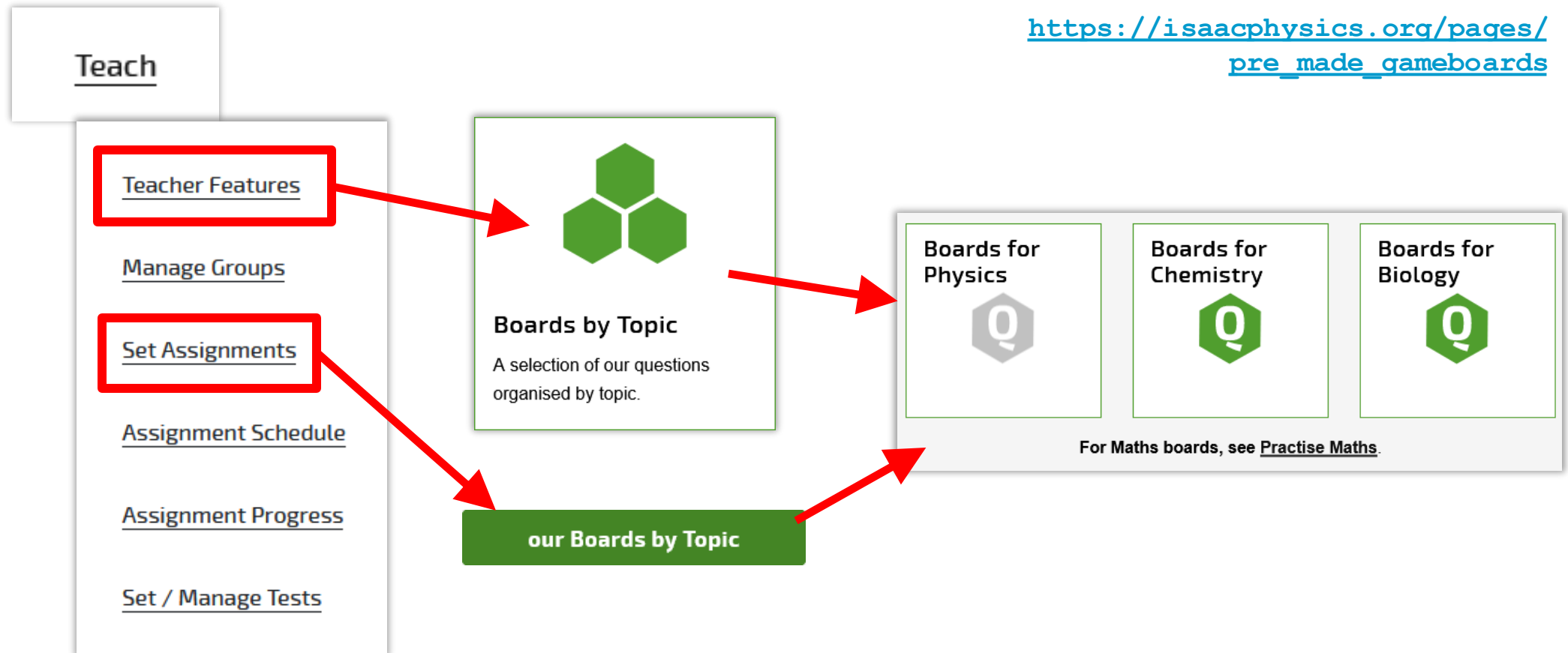


Boards by Topic

- Pre-prepared boards on one topic



https://isaacphysics.org/pages/pre_made_gameboards





Boards by Topic: features (Physics)

Lesson: Forces in equilibrium

- **Gameboard 1: Assign | View**
- **Gameboard 2: Assign | View**
- **Quick board: Assign | View**
 - Mechanics Practice: Forces and Equilibrium, Normal Reaction
 - Problem Solving: Motion at a Constant Speed, Helicopter Rising, Cases of Equilibria, A Parachutist, Misbehaving Student, Bed of Nails, Human Tower, Force on Table Legs, Tug o' War, The Three Force Problem, Hanging A Picture, Ball Suspended by a Thread, Pegs and String, Pulley System, Festival Banner

easier

harder

mix (in order)

question sources (books, online-only)

Equilibrium 1

	Motion at a Constant Speed Physics > Mechanics > Statics	GCSE 	A Level 	>
	Helicopter Rising Physics > Mechanics > Statics	GCSE 	A Level 	>
	Cases of Equilibria Physics > Mechanics > Statics	GCSE 	A Level 	>
	A Parachutist Physics > Mechanics > Statics	GCSE 	A Level 	>
	Misbehaving Student Physics > Mechanics > Statics	GCSE 	A Level 	>









Note on moments: We have some very challenging questions on moments, which are not included on these boards. Try: Three Spheres, Lifting a Rod, Space Monster Attack, Three Cylinders, or Two Rods and a Hinge.

extension suggestions

Boards by Topic: features (Chem & Bio)


























Topic	What it contains	Link
Stoichiometry and Inorganic Chemistry		
<u>Atomic Structure</u>	7×P1, 1×P2;   	<u>View board</u>
<u>Electron Configurations</u>	7×P1, 1×P2;   	<u>View board</u>

practice or
challenge?


question
types

Atomic Structure

	<h2>Periodic Table</h2> <p>Explore the elements</p>	>
	<h3>Essential Pre-Uni Chemistry D4.2</h3> <p>Chemistry > Foundations > Atomic Structure</p>	<div>GCSE</div> <div></div> <div>A Level</div> <div></div> >
	<h3>Essential Pre-Uni Chemistry D4.3</h3> <p>Chemistry > Foundations > Atomic Structure</p>	<div>GCSE</div> <div></div> <div>A Level</div> <div></div> >
	<h3>Electron Configurations (D1.1)</h3> <p>Chemistry > Foundations > Atomic Structure</p>	<div>A Level</div> <div></div> >
	<h3>Electron Configurations (D1.4)</h3> <p>Chemistry > Foundations > Atomic Structure</p>	<div>A Level</div> <div></div> >

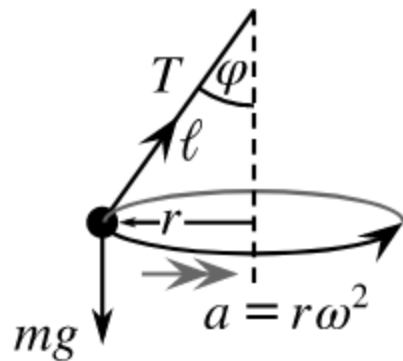


Boards by Topic: advantages

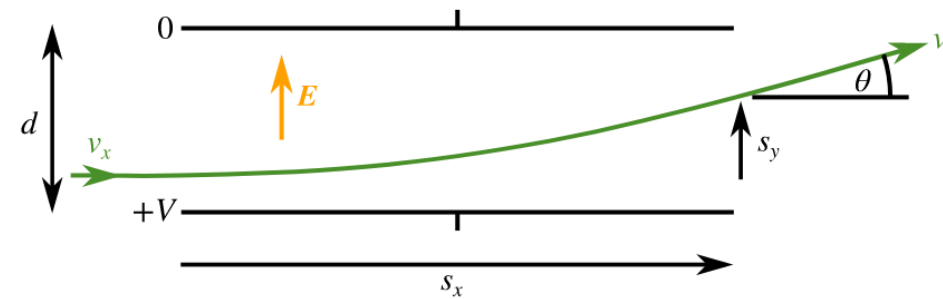
- Quicker and easier than making your own board
- Front-load your admin!
 - Add to lesson plans
 - Schedule assignments
- Easy to modify 
- Includes online-only challenging problems
- Better specification coverage than book chapters

Developing connected thinking

➤ 2D force diagram
+
Circular motion
=
Conical pendulum



➤ Electric field
+
2D kinematics
=
Electric deflection



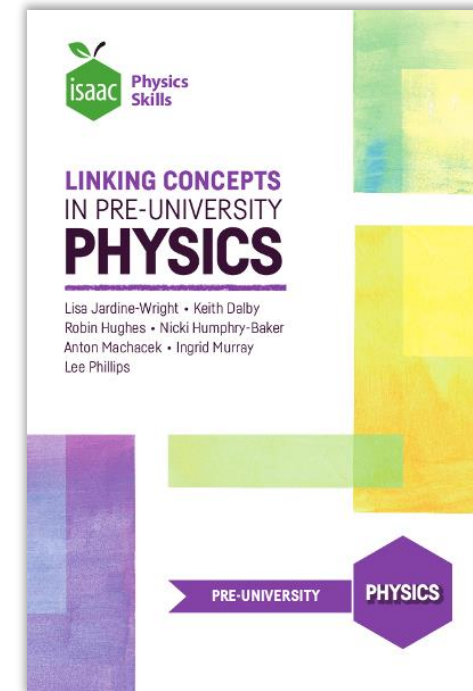


Linking Concepts: features

- 35 sections
- Repeated exposure to familiarise common “difficult” A Level scenarios
- Explicit derivation practice



https://isaacphysics.org/books/linking_concepts





Isaac is great for mastering a skill or for stretching yourself with a nice juicy problem. But how do you use it for revision?



Topic Revision Material

GCSE Resources

GCSE Physics Lessons



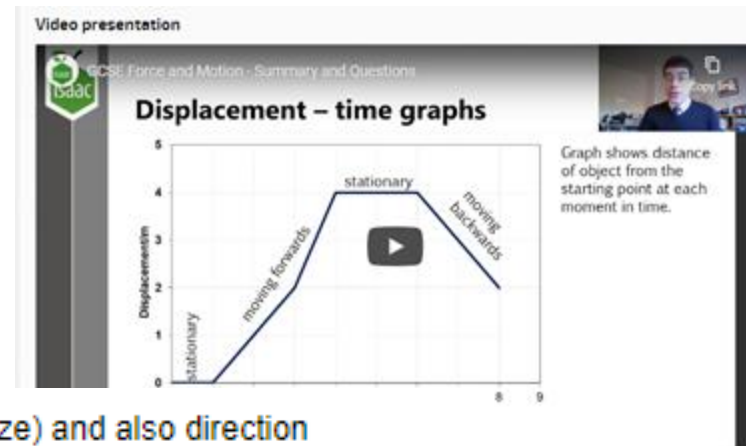
Packages of questions, recorded explanations and tutorials and topic based revision plan.

- https://isaacphysics.org/pages/remote_revision_gcse
- https://isaacphysics.org/pages/remote_revision_alevel



Topic Revision Material

- Video with pauses for [new] practice questions



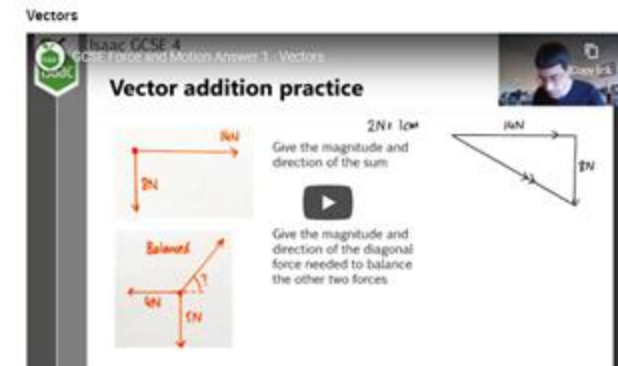
- Revision summary [notes]

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**

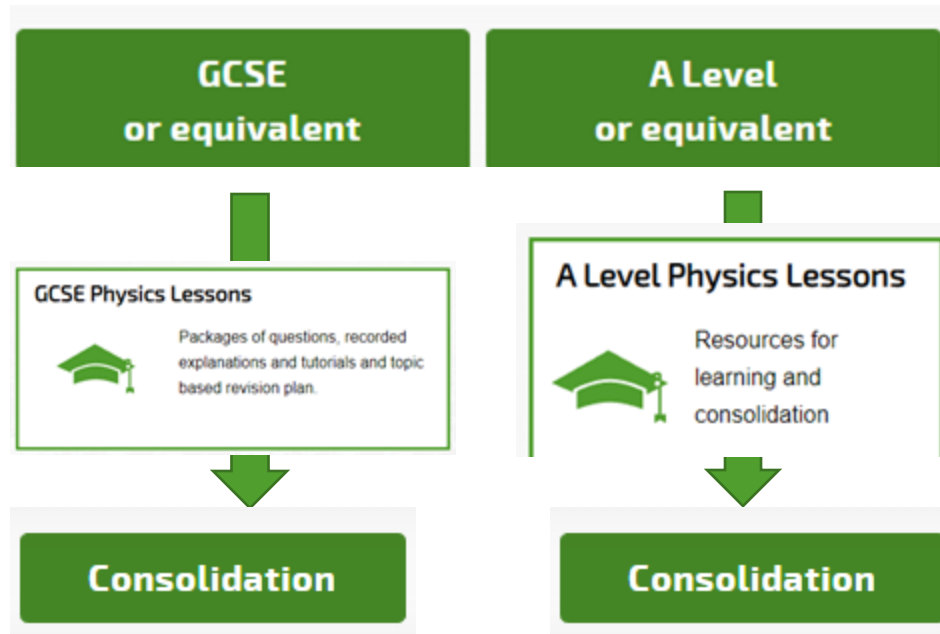
- Videos showing questions solved





*An interactive video with notes is useful.
But how do I make a programme for
students and monitor them?*

Consolidation programme



- For Yr 10 – 13 (including combined science GCSE as well as triple sciences)
- Arranged by topic
- Comprises
 - Baseline assignment
 - Links to concept/topic videos
 - Topic test
- Suitable for teacher direction or independent study



Combined Science GCSE 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 ($E = \frac{1}{2}mv^2$)
- 35 Efficiency
- 37 Springs and elastic deformation ($F = kx$, $E = \frac{1}{2}kx^2$)

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



What if the student needs help with a specific idea or concept?



Topic Revision Material

GCSE Resources

GCSE Physics Lessons



Packages of questions, recorded explanations and tutorials and topic based revision plan.

Electricity

- 22 Charge and current ($Q = It$)
- 23 Circuit rules for current and voltage
- 24 Resistance ($V = IR$)
- 25 Characteristics (current and voltage graphs)
- 26 Power ($E = Pt$, $E = qV$, $P = IV$)
- 27 Resistance and power ($P = I^2 R$)
- 28 Electromagnetic induction
- 29 Transformers
- Electricity topic revision

Take your physics further:

- Electricity problem solving questions (random selection)

- https://isaacphysics.org/pages/remote_revision_gcse
- https://isaacphysics.org/pages/remote_revision_alevel



24. Resistance

Questions (pdf)	Cloze Text	Questions (interactive)	Concepts	Extension Work
24. Resistance (notes from GCSE book)	24. Resistance in cloze text book (long.pdf)	24. Resistance (questions)	24. Resistance (explanation)	Resistance Puzzle Questions

Videos

Introduction

Tutorial



Board of relevant questions which can be amended and set to class

5 minute focused explanation of the concept & how to use it in these questions

tutorial video shows you how to do the questions



Pre-packaged resources for one concept?
Are you thinking what I am thinking...

COVER!

But I want to lead the revision session myself...

- PDF files of the slides used in the topic revision videos are available to teachers through https://isaacphysics.org/pages/topic_revision_slides

Topic Revision Slides

Unpublished

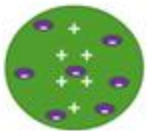
Here are downloadable versions of the slides used in the topic revision videos.

GCSE

Topic
Electricity
Energy
Matter
Force & Motion

Atomic models

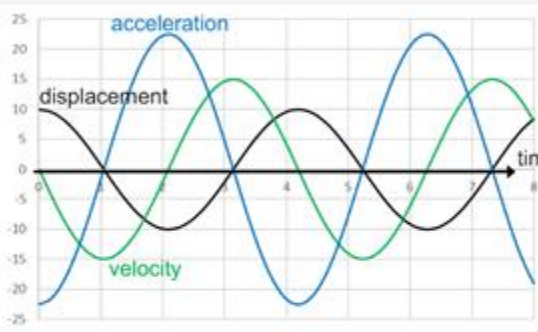
Plum pudding



Scattering

Alpha particles fired at the atom usually did not deflect. A small number were bounced back.

SHM graphs



When plotted against displacement

- velocity graph makes ellipse
- acceleration graph straight with negative gradient

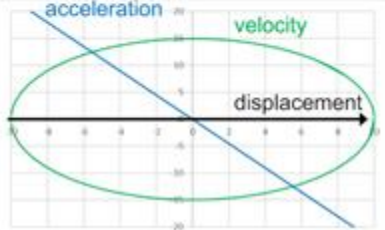
Time graphs

Here, $\omega = 1.5 \text{ rad s}^{-1}$.

$A = x_{\text{max}} = 10, v_{\text{max}} = 15, a_{\text{max}} = 22.5$

v peaks $\frac{1}{4}$ cycle before x

a peaks $\frac{1}{4}$ cycle before v





Events



Masterclasses

- Several throughout the academic year
- Based on core topics e.g., electricity
- Aimed at GCSE and A Level students
- 2-3 hours, guided problem solving
- Mostly online, but also in person (Y12)
- Find upcoming masterclasses on our events page, updated termly



Mentoring

The screenshot shows the Isaac Physics website with the 'Events' menu open, highlighting 'Student Mentoring'. The main banner reads 'Master Physics by Solving Problems: from School to University!'. Below this, the 'Mentoring Scheme 2023/24' details are listed:

- Begins on Tuesday 29th August, with the first video appearing on Tuesday 5th September.
- As a student and / or teacher you can have a direct interaction with one of the Isaac Physics team.
- Each week (including through school holidays) your mentor will set an assignment - a set of questions that are at a mixed level (book questions and Levels P to CCC through the year) that should you should spend **at least one hour** in attempting.
- Tutorials that have been recorded will be deleted on a termly basis.
- The questions are **for YOU and NOT for your teacher!** If you really are stuck, ask us for help. use the **Contact Us** at the bottom of the page, or the flag for the question. Ask something specific, and not "I am stuck".
- The point? To encourage you to try out some physics problems as a social activity, joining in with the struggle to solve them. Work with an Isaac Physics Mentor struggling through the problems themselves.

Navigation links at the bottom include: [Tutorial Pages](#), [The Reward - Why Join the Scheme?](#), and [How Do I Join?](#)

Once you have signed up to a particular mentoring scheme group, you can use the following pages in order to watch the tutorials and check on the work set.

- Weekly online mentor sessions to develop problem solving with Robin Hughes
- Separate questions for Y11, Y12 and Y13

The screenshot shows the 'Upcoming/Recent tutorial' section. It includes a video player for 'Y13 Isaac Physics Mentoring scheme - week 8'. The video shows a hand holding a pen, writing on a whiteboard with physics diagrams and equations. A red YouTube play button is overlaid on the video. Text above the video states: 'Online tutorial for **Week 8**: available from **Monday 18th December 2023**. This video link below is for week 8.'

Senior Physics Challenge (SPC)

- Year 12 students enter on Isaac Physics before May
- Selection criteria based on number of A Level (or above) challenge questions completed
- 50 students invited to summer residential
 - Lectures on quantum mechanics
 - Practical sessions in undergraduate labs
 - Meet other students and staff

