isaac Physics. You work it out.

Supporting Learning

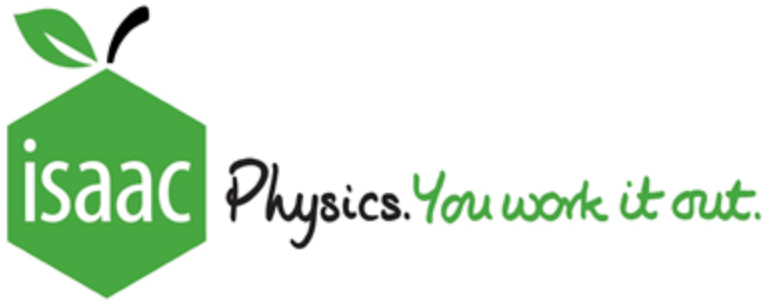
Dr. Lee Phillips
Senior Content Developer

Kimlam Nguyen
Content Developer

Dr. Anton Machacek
Associate Director

Supporting Learning

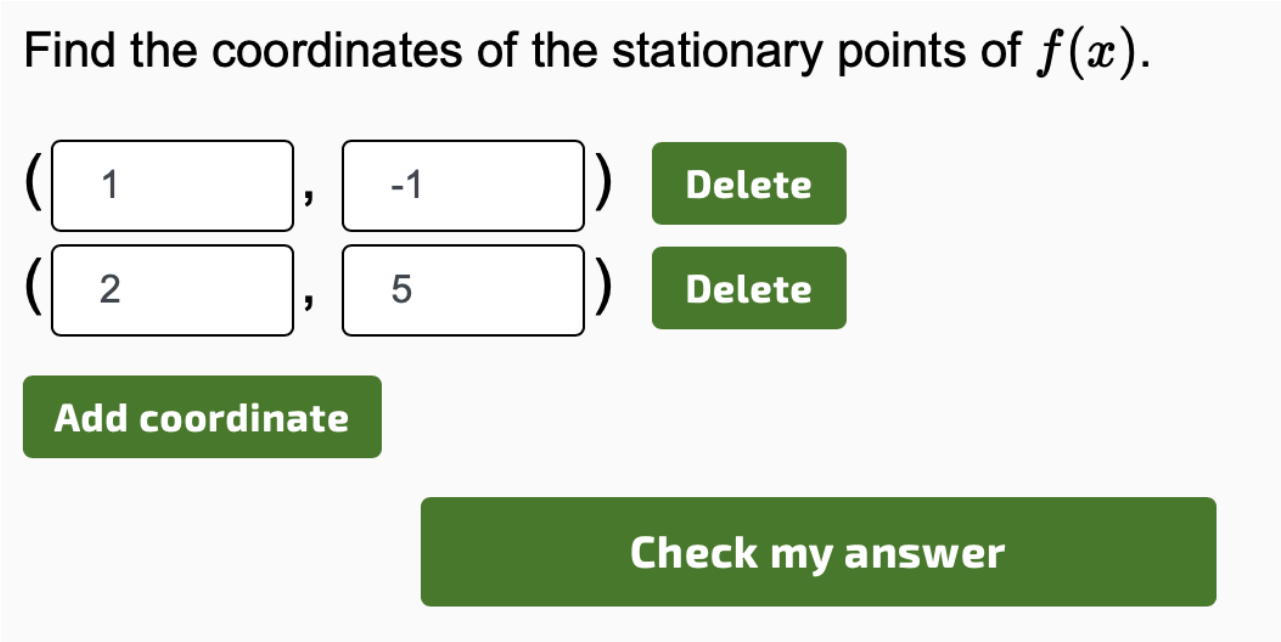
- Features (9:05)
  - New question types
  - Tests
  - Live monitoring of lessons
  - Contact us and Question Flags
- Content (9:30)
  - Boards for Lessons
  - Developing connected thinking
  - Concept lessons for cover & Revision
- Events (9:55)
  - Masterclasses
  - Senior Physics Challenge
  - Mentoring programme



Features

New question types

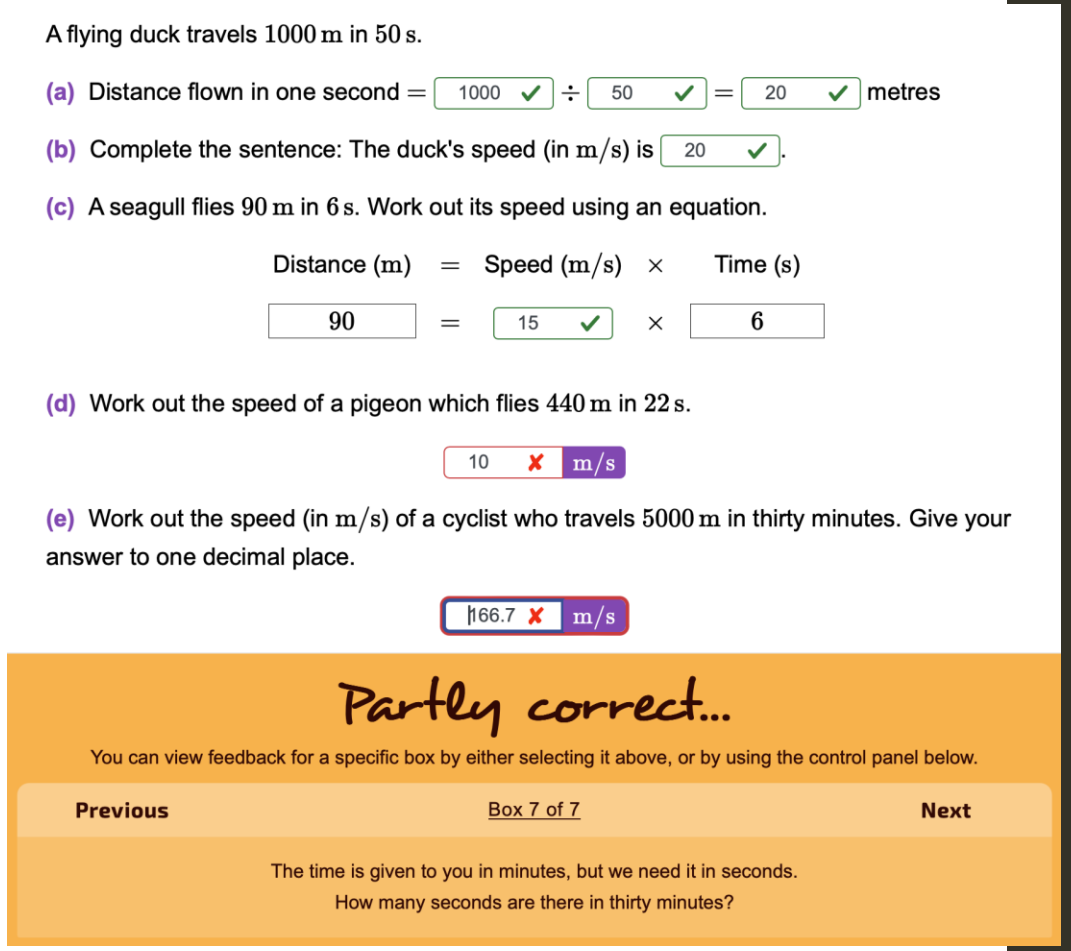
- Coordinate questions
  - Answer with a pair of numbers
  - Add as many pairs as needed
  - In any order



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



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 kΩ	(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	Unit...	300 Ω	Unit...
240 V	13 A	Unit...	Unit...
240 V	Unit...	25 Ω	Unit...
Unit...	100 A	3.0 Ω	Unit...
240 V	Unit...	Unit...	2 500 W
240 V	Unit...	Unit...	60 W
23 kV	Unit...	Unit...	23 MW
9.0 V	Unit...	22 kΩ	Unit...
Unit...	30 mA	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 trolle with a resultant force pushing forwards motion)?

(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?

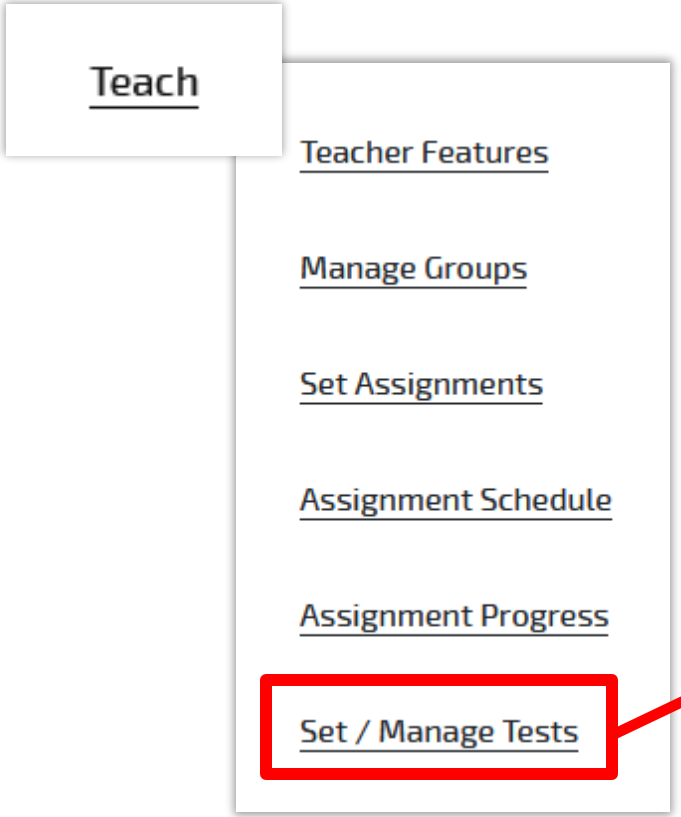
Speed up
Slow down
Stay still
Steady speed
Turn

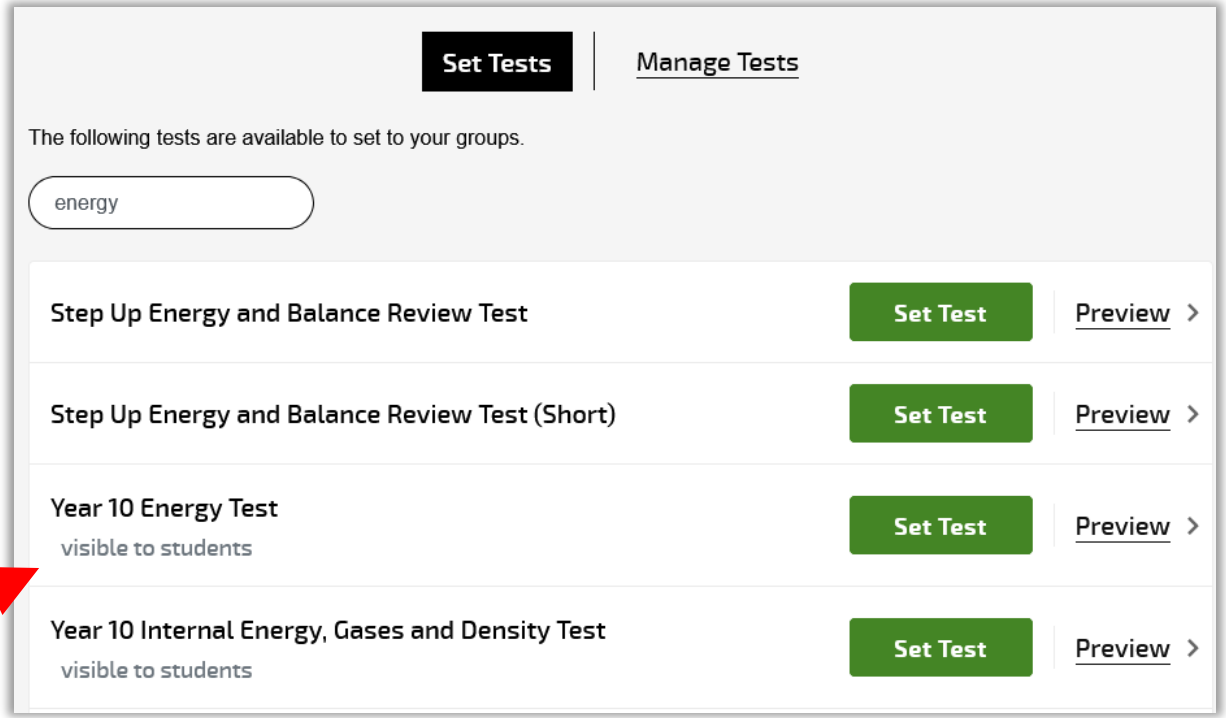
Check my answer

Tests

- Informal assessment with delayed feedback

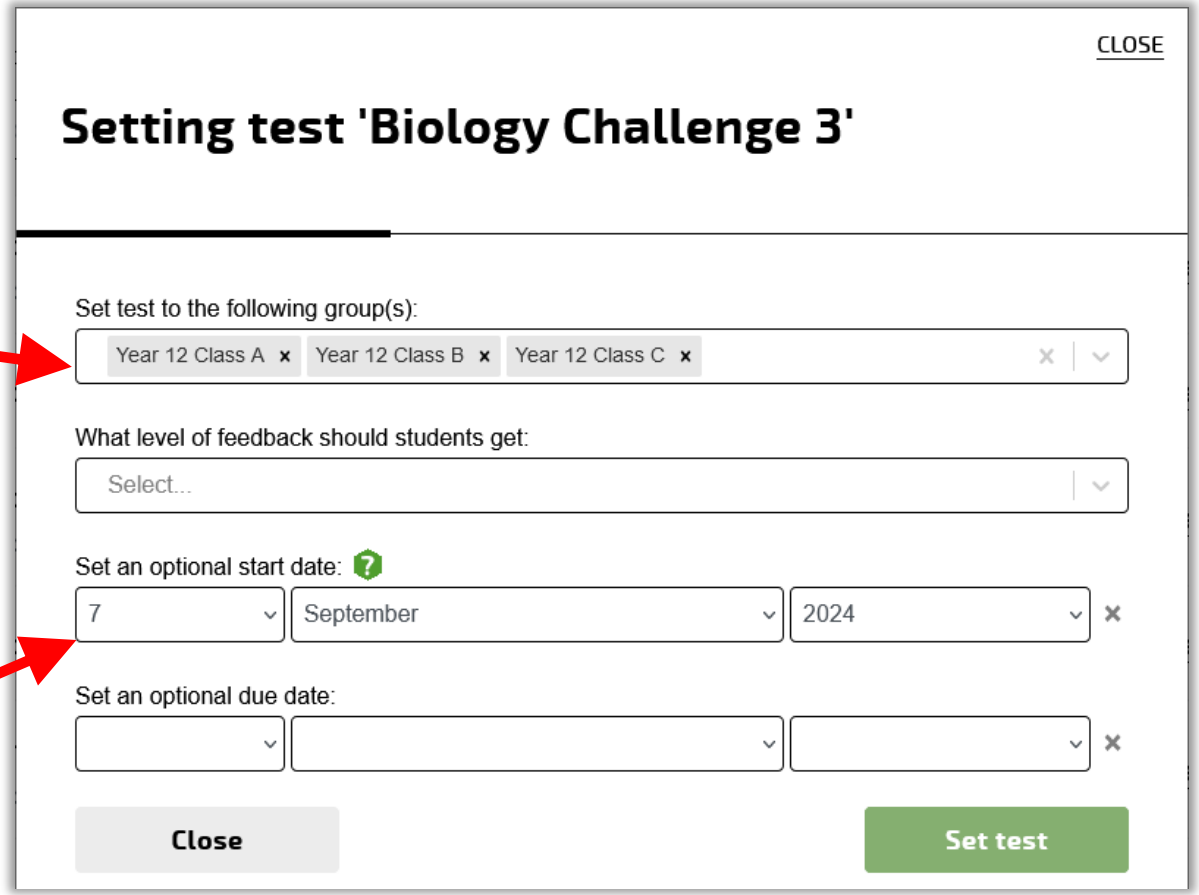
https://isaacphysics.org/set_tests





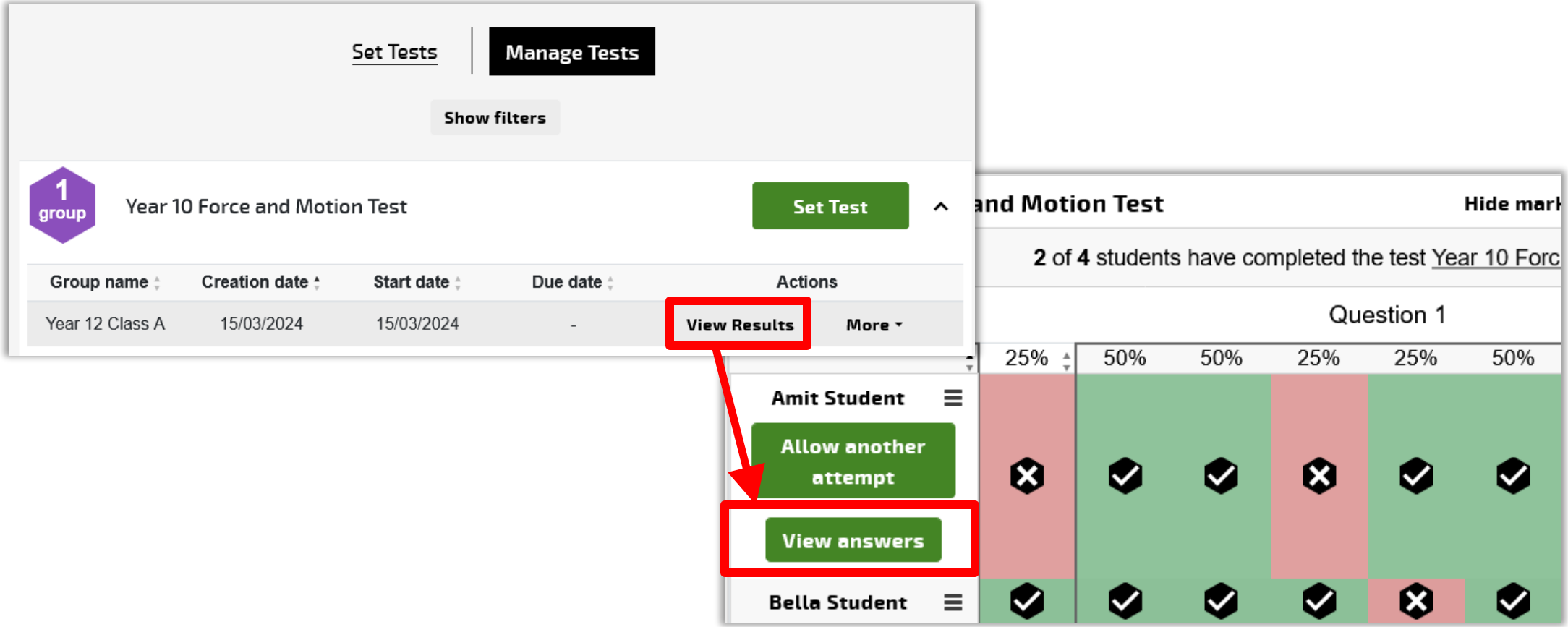
Tests: New features 1

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



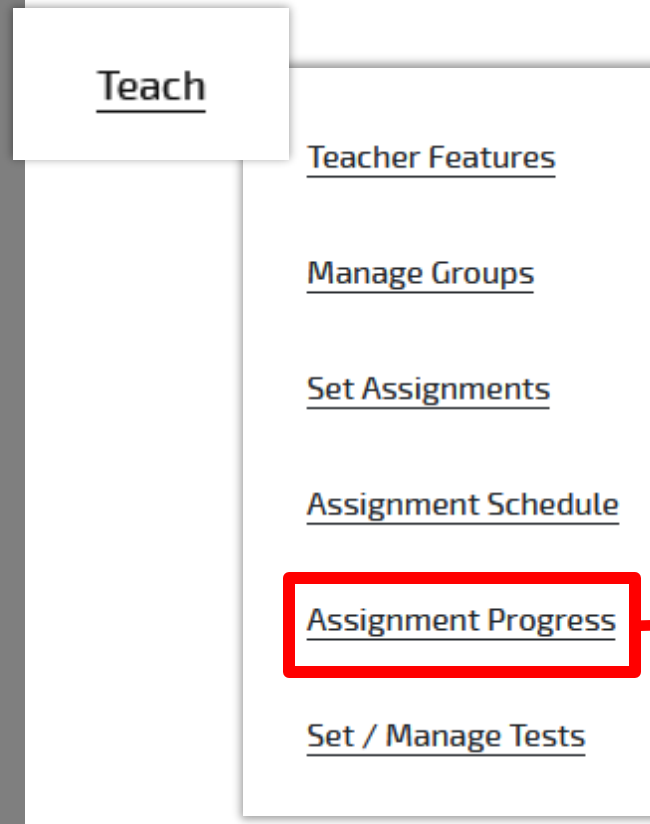
Tests: New features 2

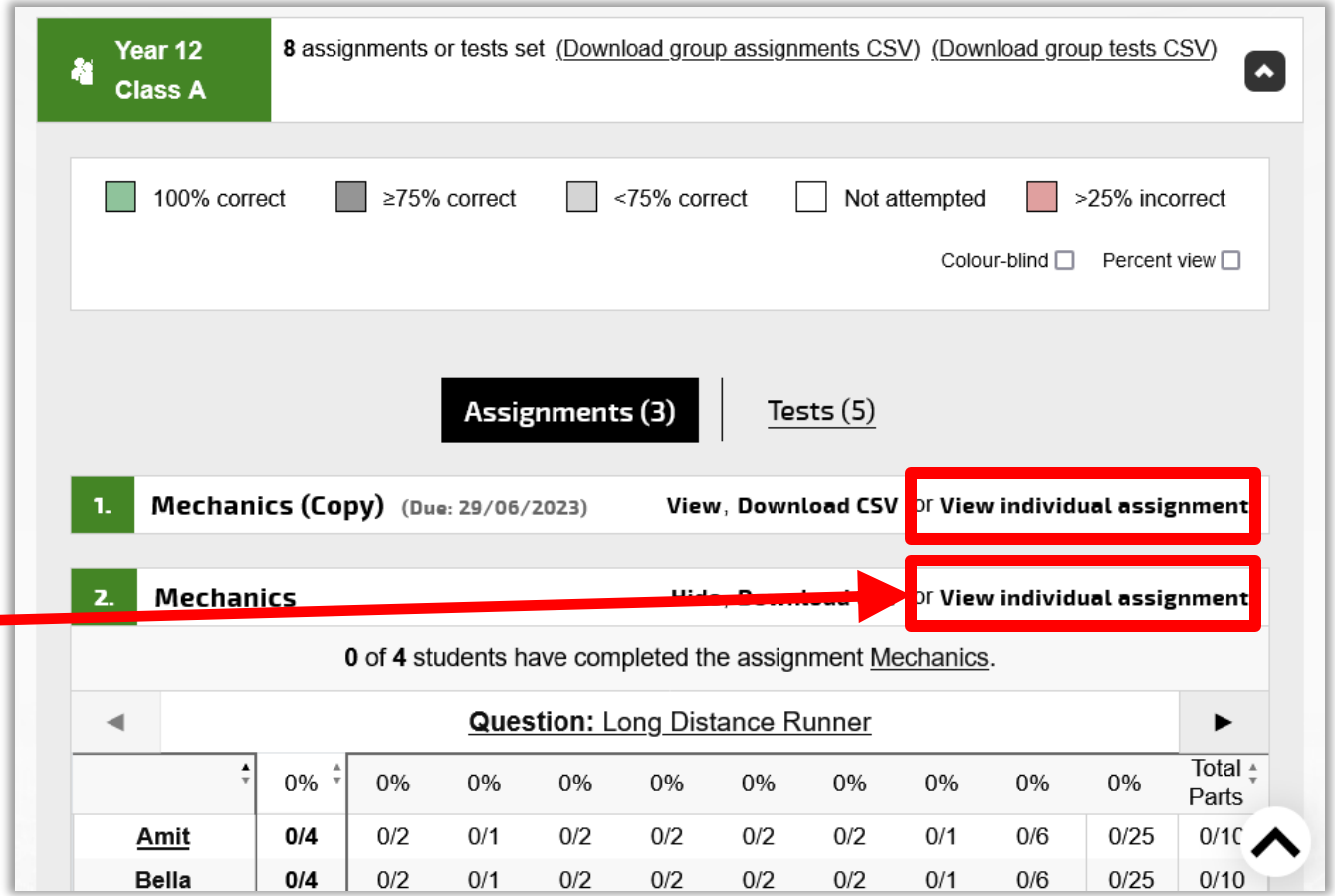
- View a student's answers!



Live monitoring of lessons

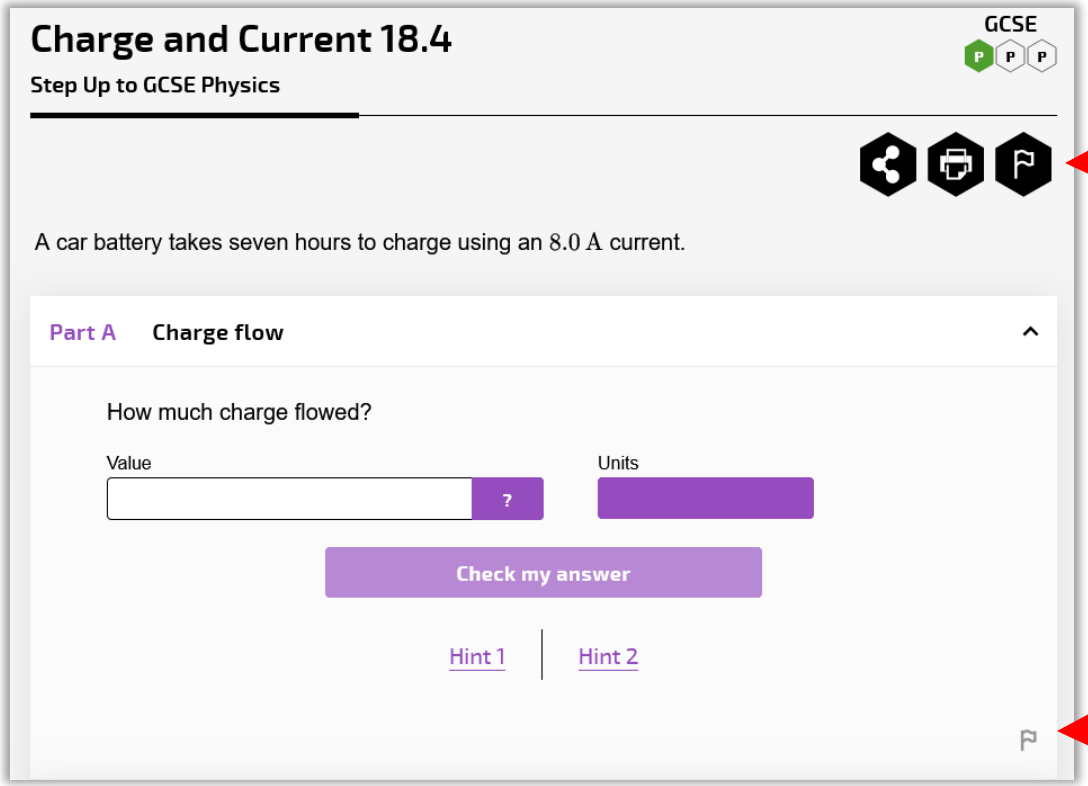
- Refresh to update student progress





Contact us and question flags

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



ask about a whole question…

…or just one part

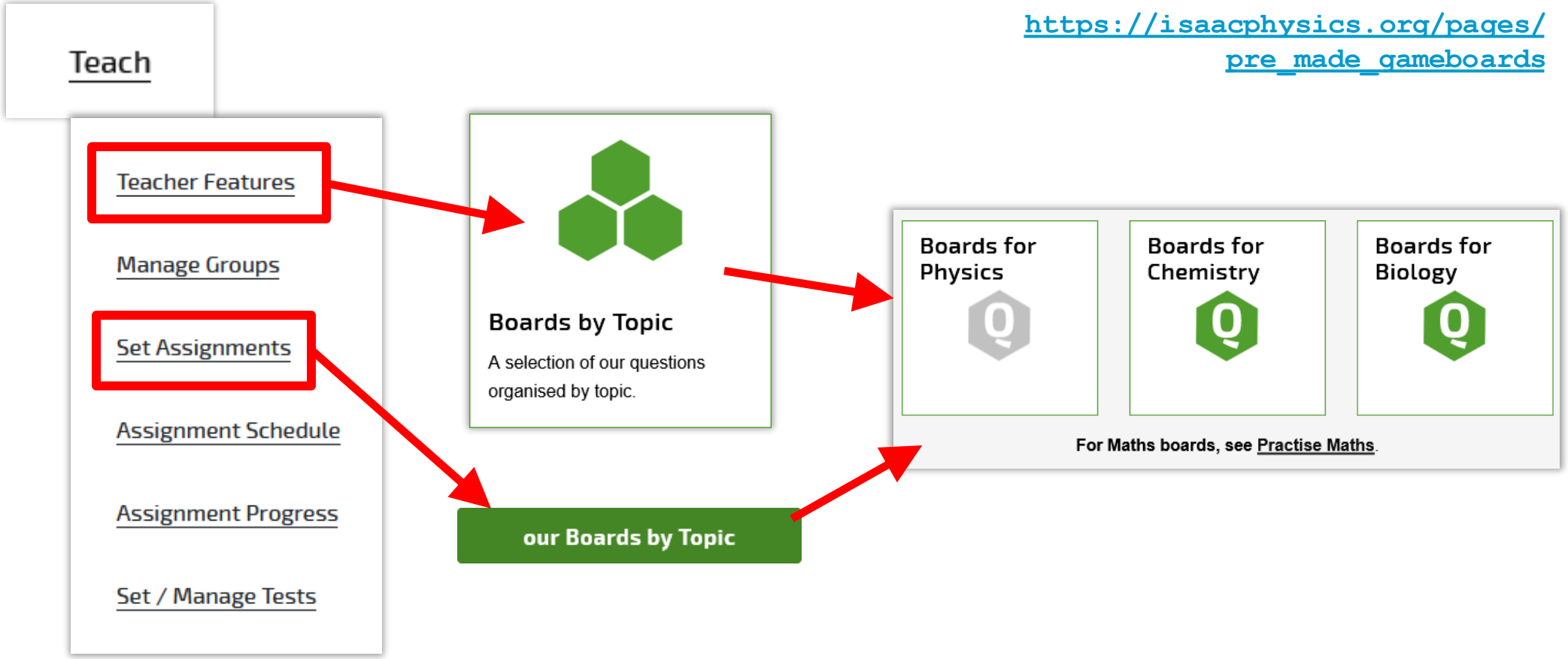
isaac Physics. You work it out.

Content

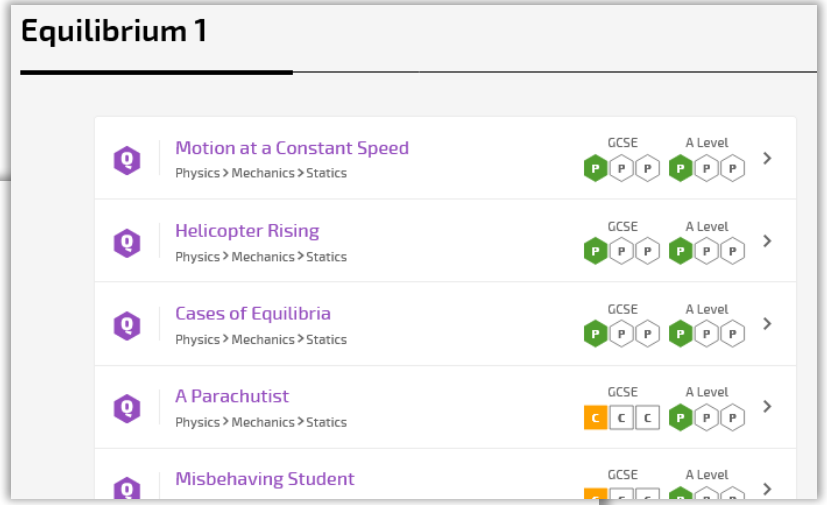
Boards by Topic

- 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)

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.*

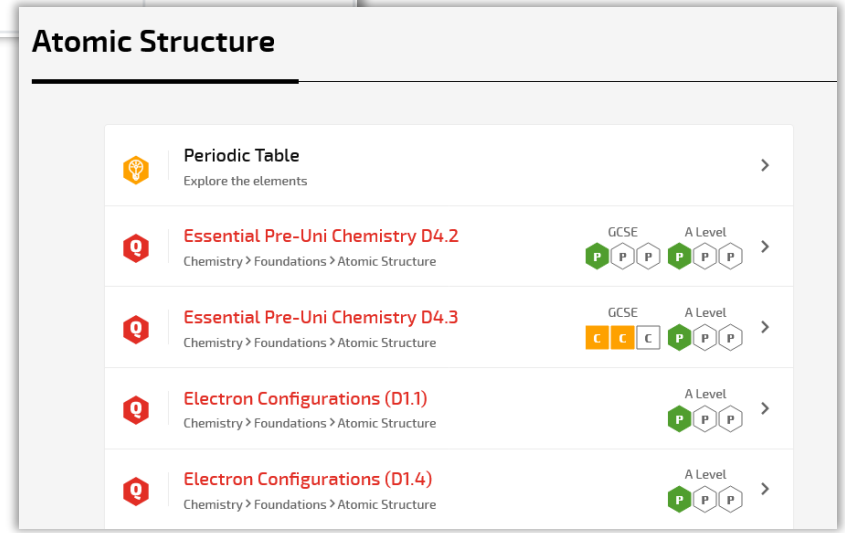
extension suggestions

Boards by Topic: features (Chem & Bio)

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

practice or challenge?

question types



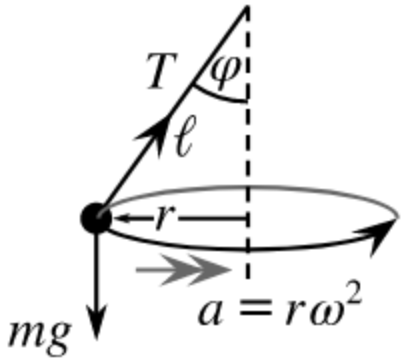
Boards by Topic: advantages

- Quicker and easier than making your own board
- Front-load your admin!
  - Add to lesson plans
  - Schedule assignments
- Easy to modify 

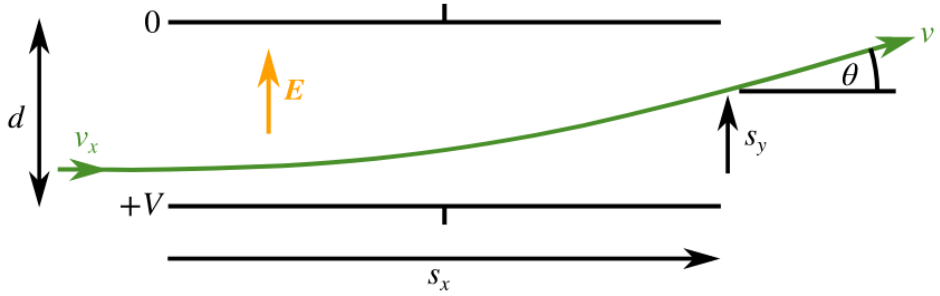
- Includes online-only challenging problems
- Better specification coverage than book chapters

Developing connected thinking

- 2D force diagram
+
Circular motion
=
Conical pendulum



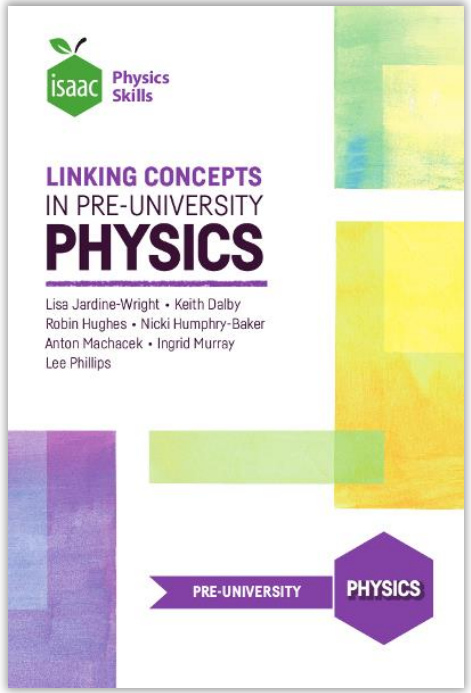
- Electric field
+
2D kinematics
=
Electric deflection



Linking Concepts: features

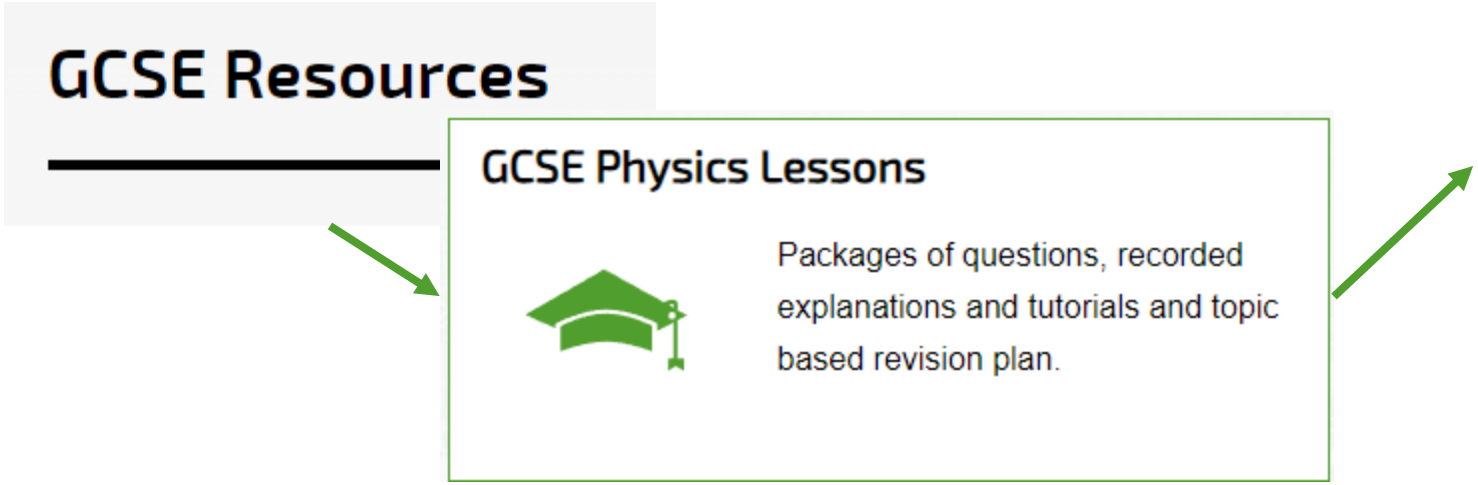
- 35 sections
- Repeated exposure to familiarise common "difficult" A Level scenarios
- Explicit derivation practice

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?

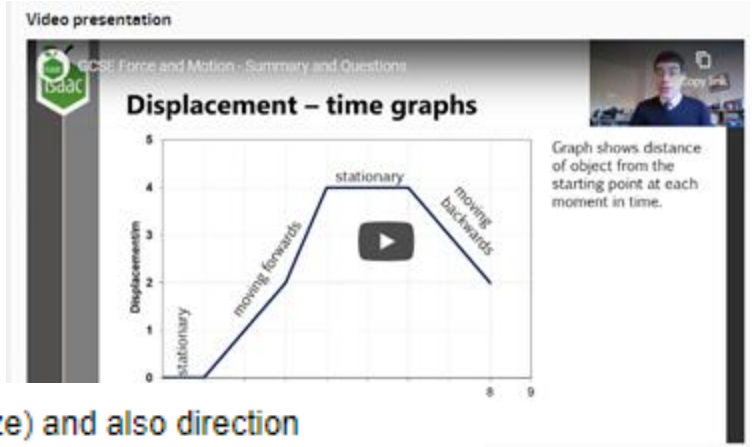
Topic Revision Material



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

Topic Revision Material

- Video with pauses for [new] practice questions



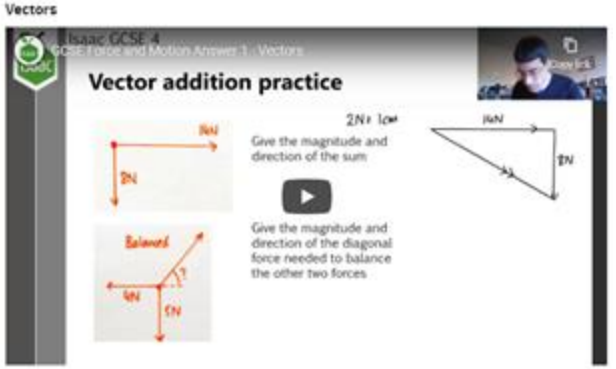
- Revision summary [notes]

Vectors, like velocity, displacement and force have magnitude (size) and also direction

Scalars, like mass, time, distance and speed only have magnitude

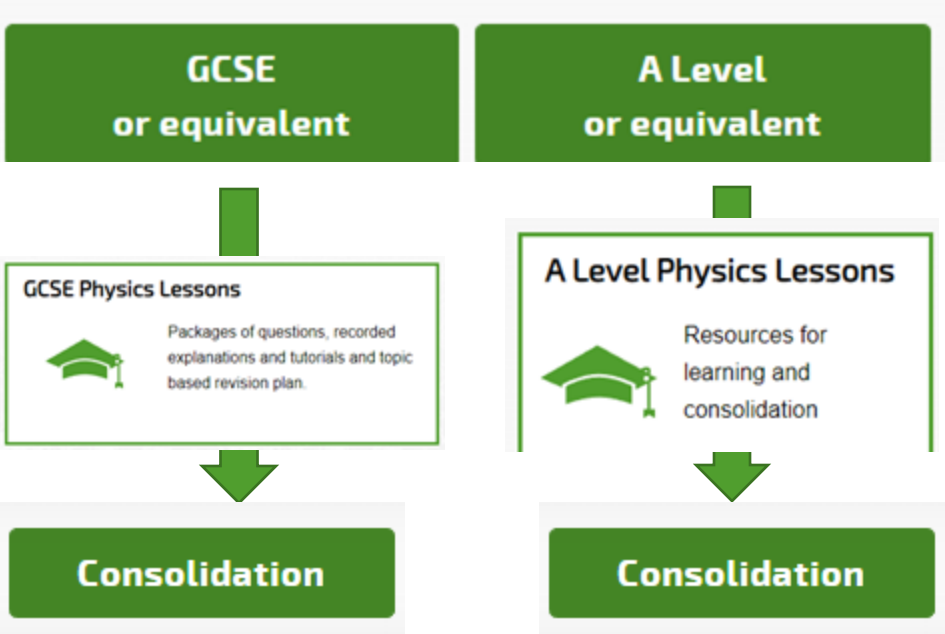
To add vectors, draw the arrows to scale for example $2\,\mathrm{N} \rightarrow 1\,\mathrm{cm}$, and join them **nose to tail**

- 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

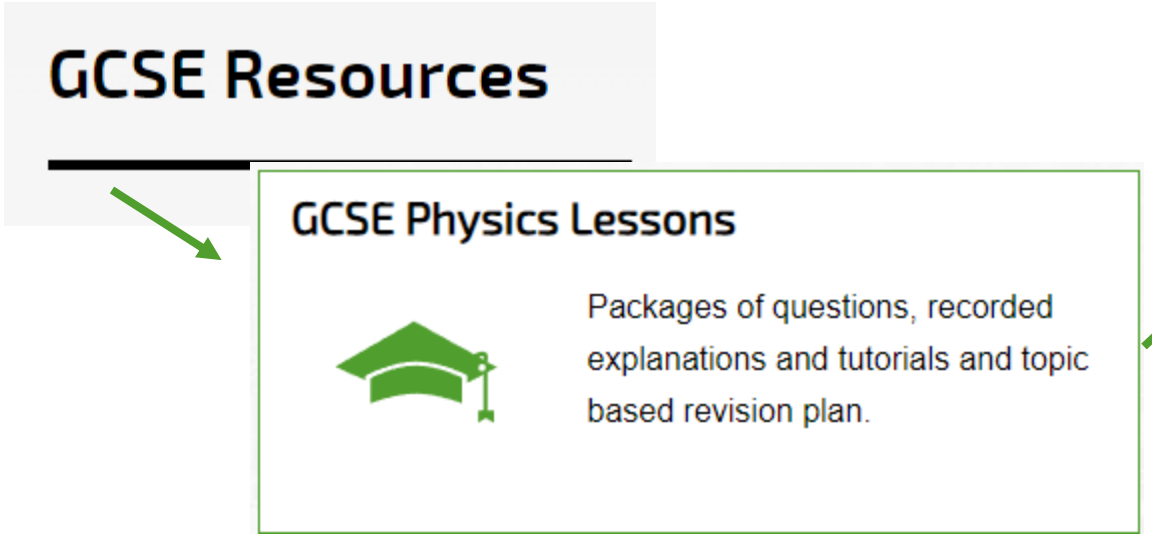
Revision resources on individual concepts (concept video, practice assignment & tutorial video showing how to answer the questions) are listed below. Numbers refer to sections of the GCSE Workbook.

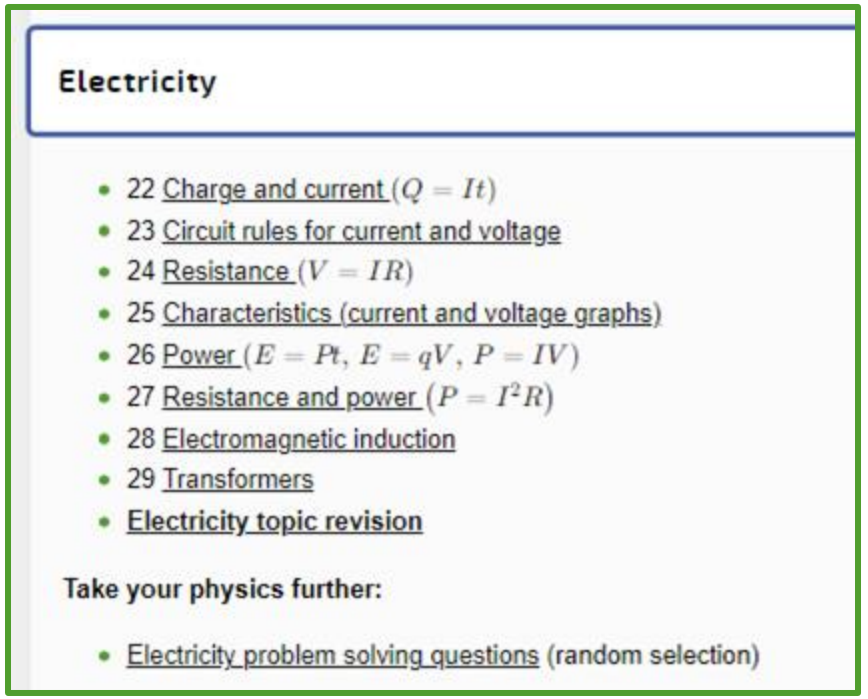
- 30 Thermal energy and heat capacity ($E = mc\,\Delta T$)
- 32 Payback times
- 33 Work, gravitational potential energy and power ($E = Fs$, $E = Pt$, $E = mgh$)
- 34 Kinetic energy ($E = \frac{1}{2}mv^2$)
- 35 Efficiency
- 37 Springs and elastic deformation ($F = kx$, $E = \frac{1}{2}kx^2$)

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





- 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

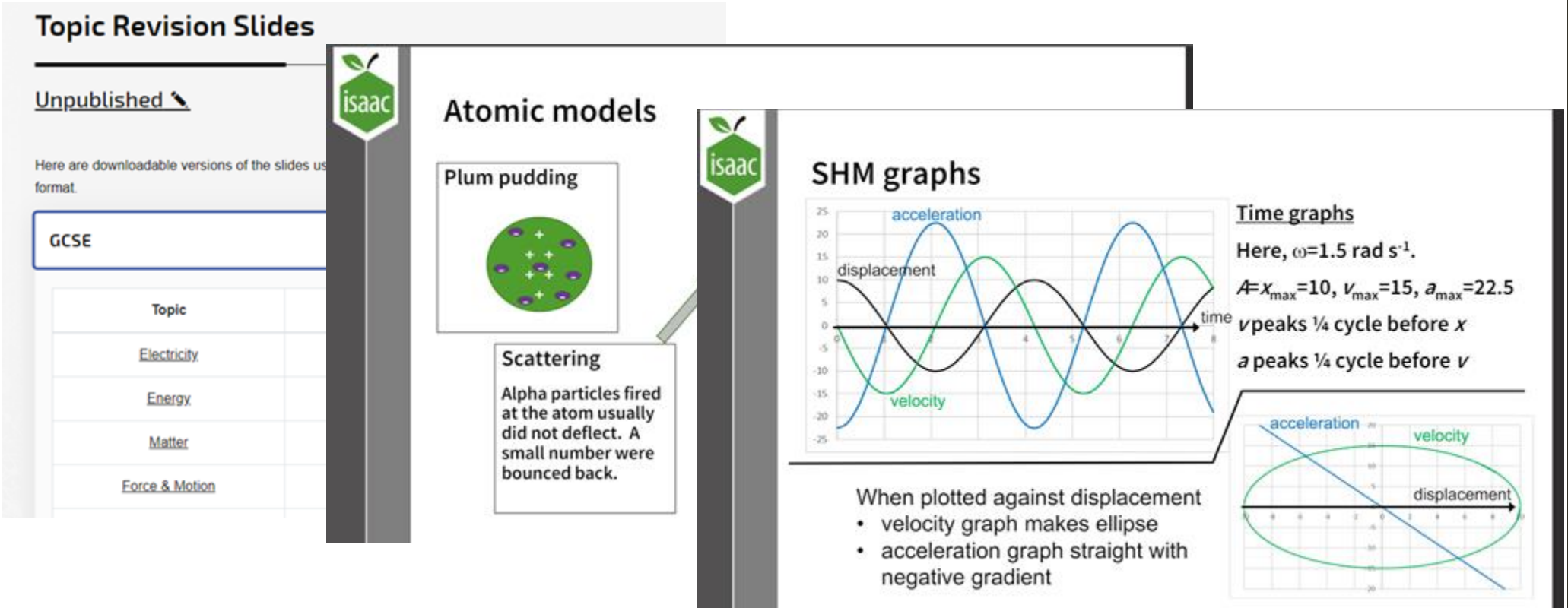
Pre-packaged resources for one concept?

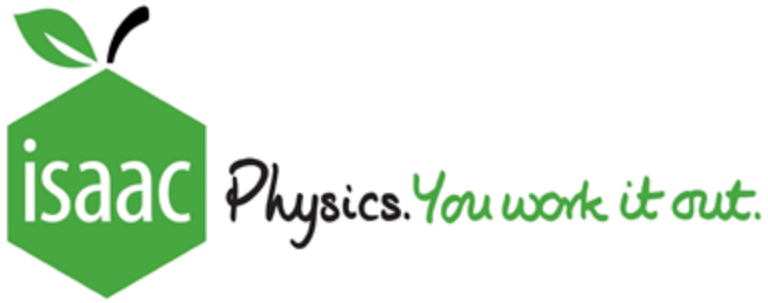
Are you thinking what I am thinking...

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



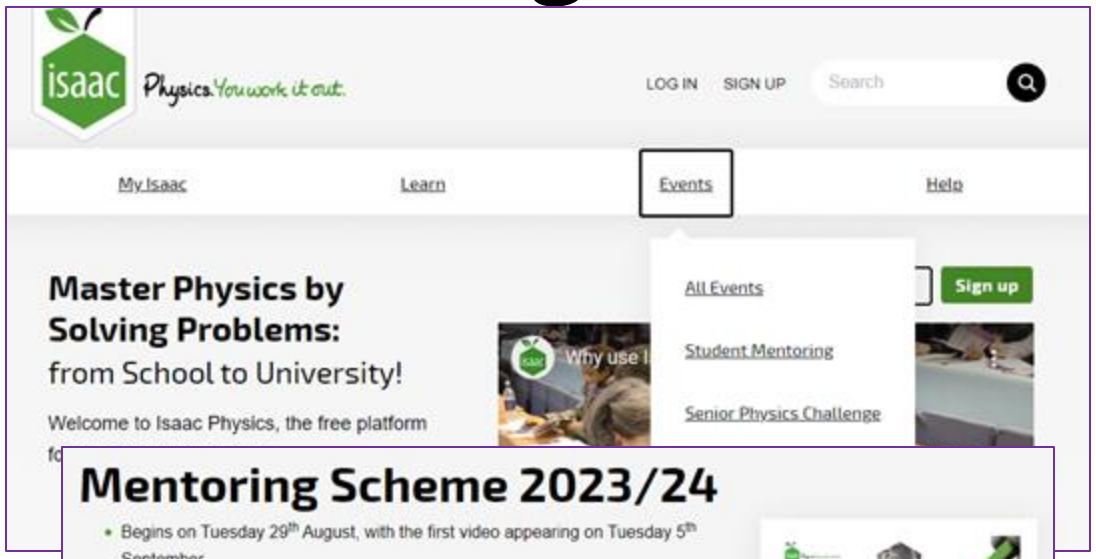


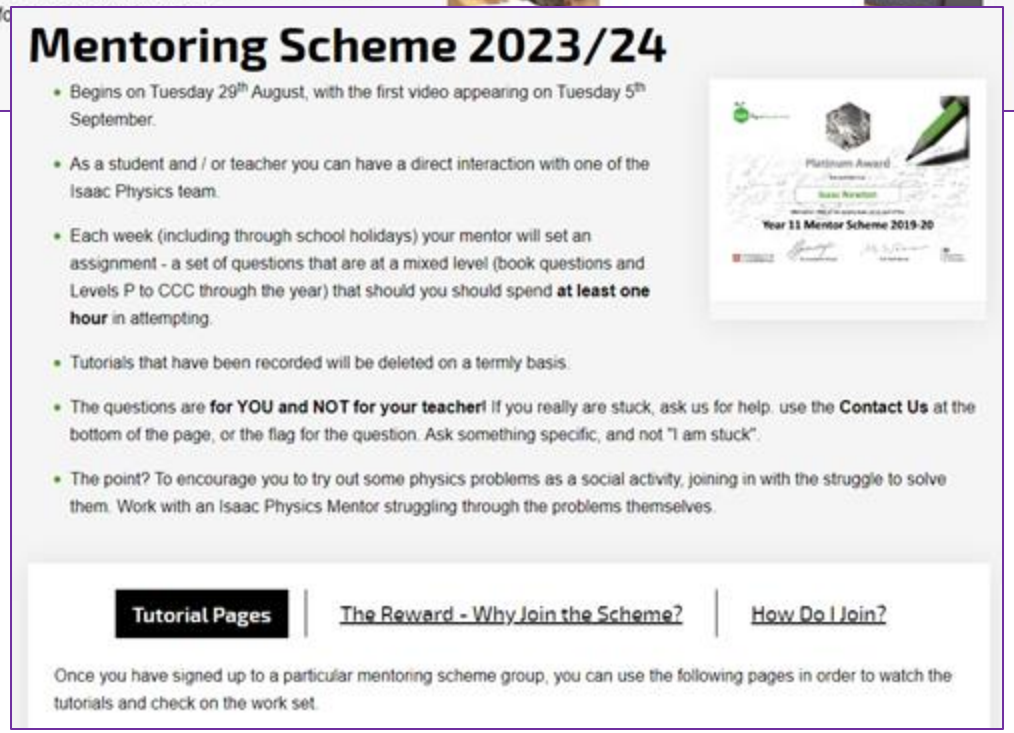
Events

Masterclasses

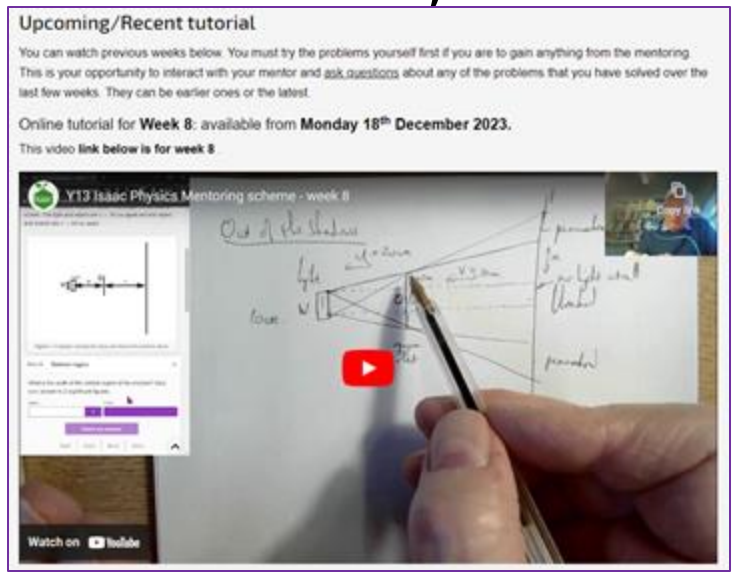
- Several throughout the academic year
- Based on core topics e.g., electricity
- Aimed at GCSE and A Level students
- 2-3 hours, guided problem solving
- Mostly online, but also in person (Y12)
- Find upcoming masterclasses on our events page, updated termly

Mentoring





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



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