How we use Isaac Physics

Wednesday 18th October 2023

Nick Davies
Team leader, Physics
Wilmslow High School
ndavies@wilmslowhigh.com

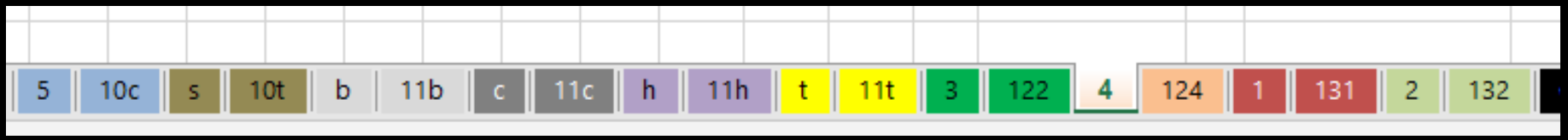
N Davies 2017

Who uses isaac?

- A Level
  - physics (75)
  - (physical) chemistry (80)
  - Biology (80)
- GCSE Physics, (500)
- Year 8 & 9 Physics, (300)
- Year 7 – to be integrated at a later date
  - GCSE quizzes with Y9 very useful
- Maths use Sparx (they say it is really good),
- Only a few physics students use Isaac Maths

Mark book structure

- Each class has two worksheets in excel

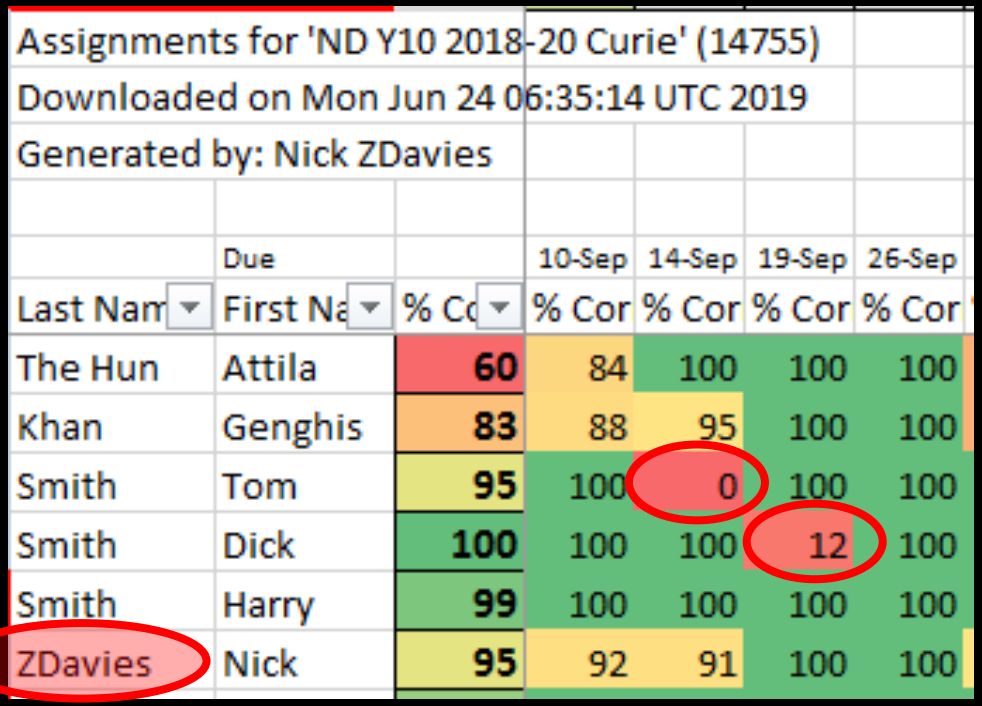


- The first of each pair is the Isaac download worksheet
- The second is the main mark-book worksheet where all class and homework and tests (etc) are recorded

The Isaac download worksheet

Cut & paste Isaac download into first worksheet

- I am last alphabetically (ZDavies).
- This ensures I can see if I have not done any of the questions set to the class (important for A Level especially)



Assignments for 'ND Y10 2018-20 Curie' (14755)						
Downloaded on Mon Jun 24 06:35:14 UTC 2019						
Generated by: Nick ZDavies						
	Due		10-Sep	14-Sep	19-Sep	26-Sep
Last Nam	First Na	% Cc	% Cor	% Cor	% Cor	% Cor
The Hun	Attila	60	84	100	100	100
Khan	Genghis	83	88	95	100	100
Smith	Tom	95	100	0	100	100
Smith	Dick	100	100	100	12	100
Smith	Harry	99	100	100	100	100
ZDavies	Nick	95	92	91	100	100

Isaac download worksheet

Topic analysis (Formulae)

student order check

(Board) formulae

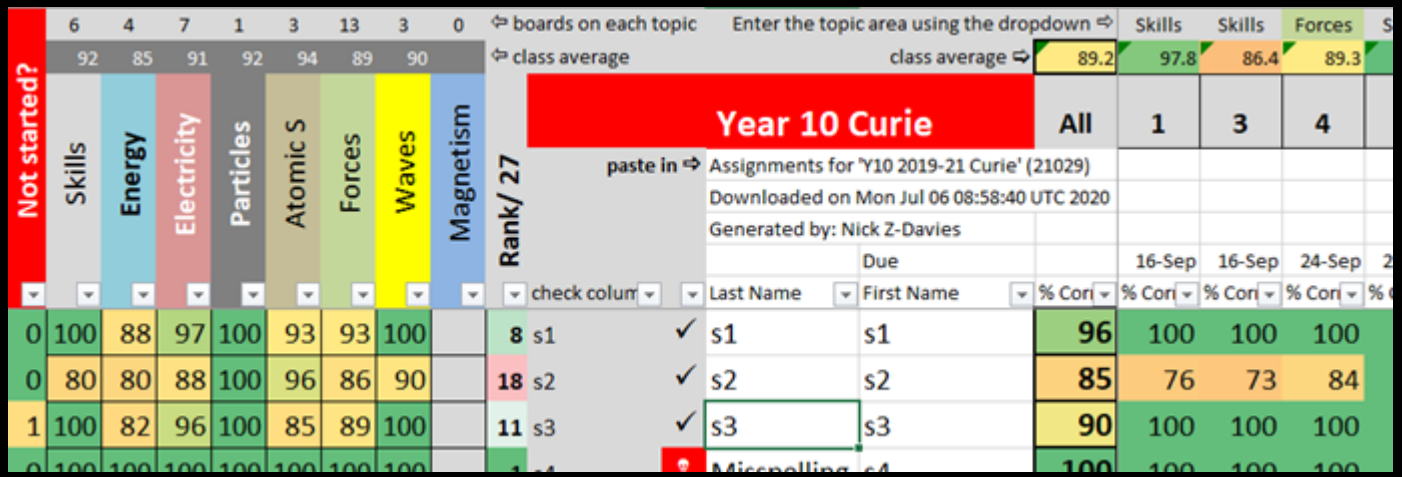
Unedited
Isaac Physics download

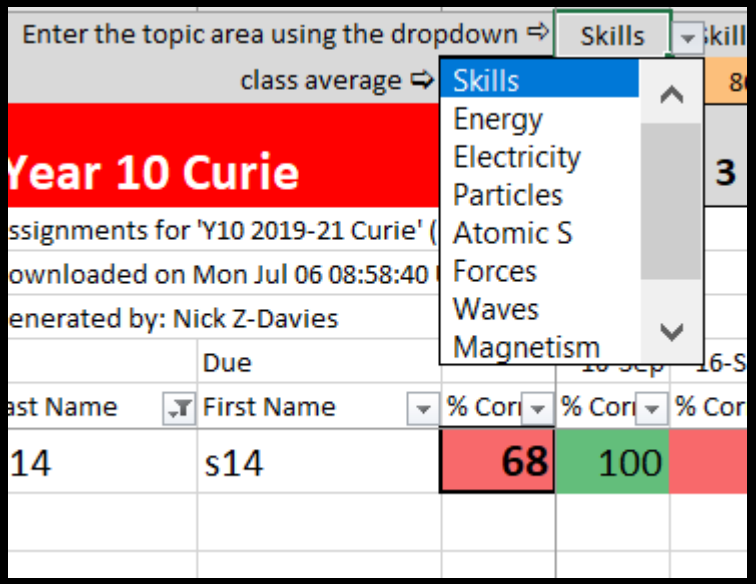
The formulae analyse results by topic
Formulae also feeds information into the second worksheet

download order must match mark-book order

=IF(S14=R14,"ü","N")
Font = wingdings
Conditional formatting set

How does the Isaac download worksheet work?



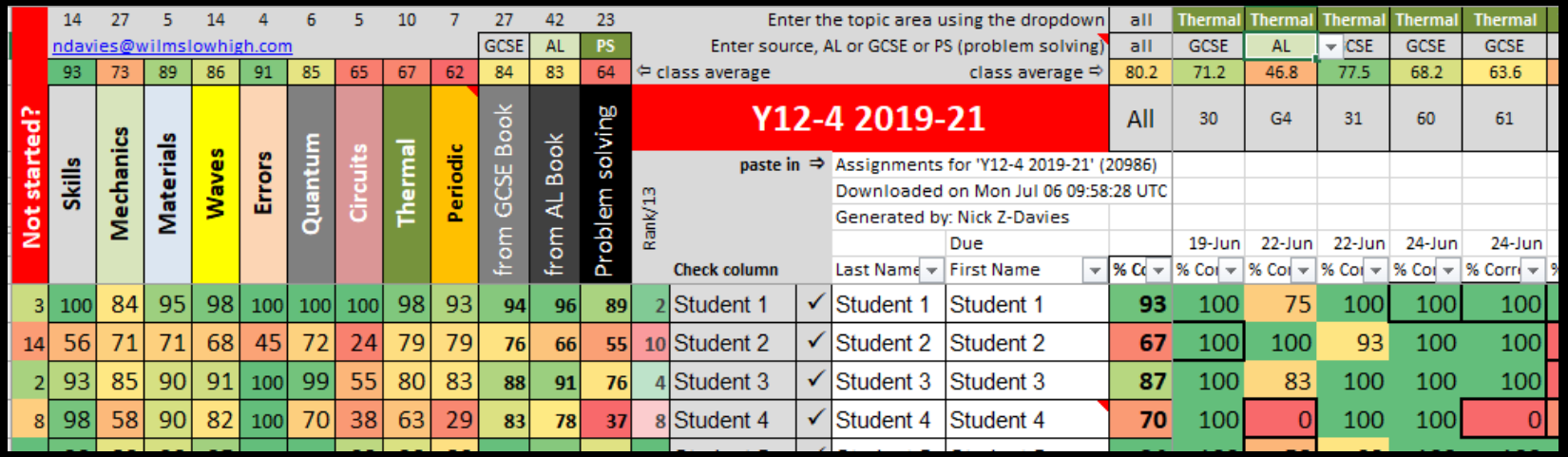


All my boards are classified on the code tab (last tab).

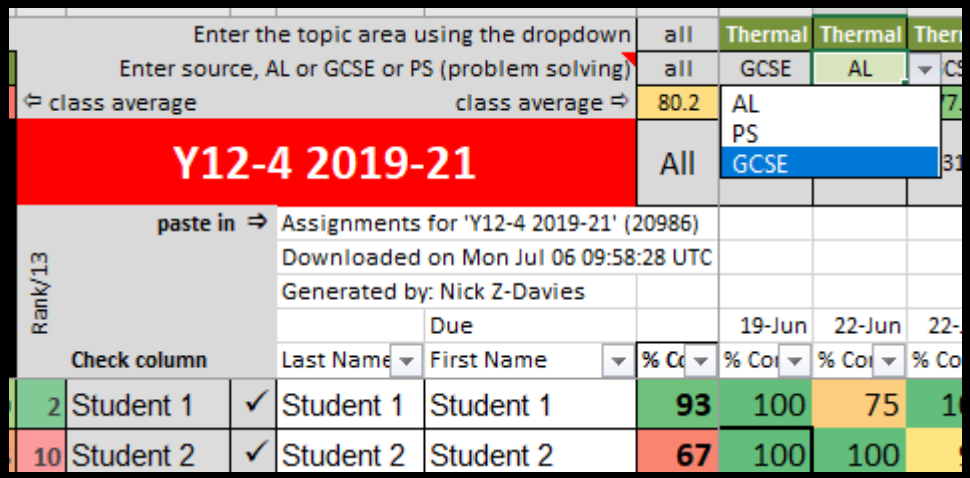
You can also manually select the topic and source from the drop down lists and add a short name, if it's a new board.

Or (if brave) edit the code tab to classify your new board

How does the Isaac download worksheet work?

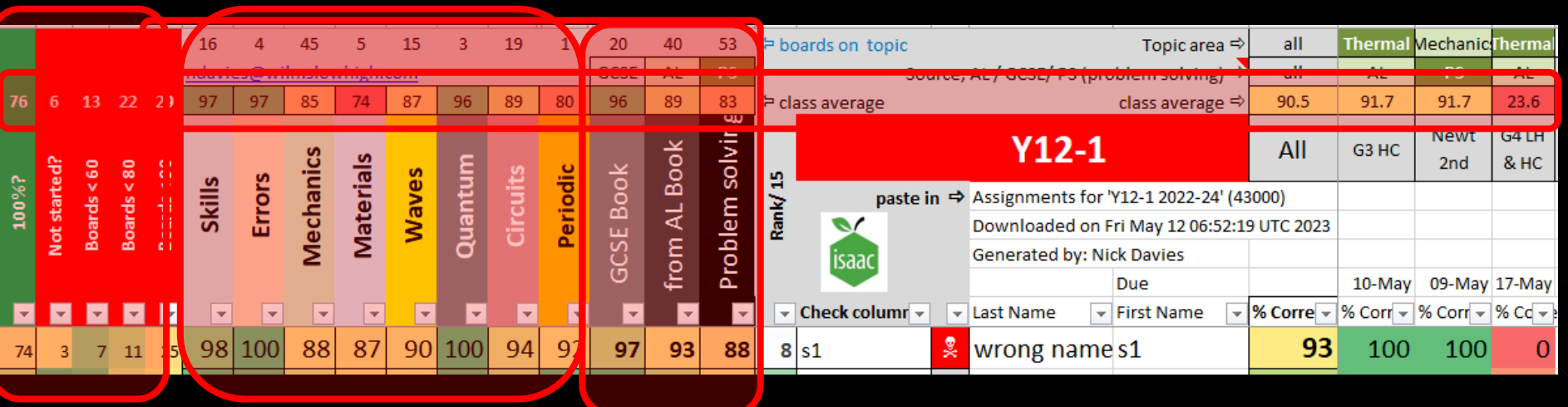


Not started?	Skills	Mechanics	Materials	Waves	Errors	Quantum	Circuits	Thermal	Periodic	from GCSE Book	from AL Book	Problem solving	Rank/13	Check column		Last Name	First Name	% Co	Enter the topic area using the dropdown	all	Thermal	Thermal	Thermal	Thermal	Thermal
	14	27	5	14	4	6	5	10	7	27 GCSE	42 AL	23 PS							Enter source, AL or GCSE or PS (problem solving)	all	GCSE	AL	CSE	GCSE	GCSE
	ndavies@wilmslowhigh.com																		⇦ class average	class average ⇨	80.2	71.2	46.8	77.5	68.2	63.6
	93	73	89	86	91	85	65	67	62	84	83	64														
	Y12-4 2019-21																			All	30	G4	31	60	61
															paste in ⇒	Assignments for 'Y12-4 2019-21' (20986)								
																Downloaded on Mon Jul 06 09:58:28 UTC									
																Generated by: Nick Z-Davies									
																	Due			19-Jun	22-Jun	22-Jun	24-Jun	24-Jun	
3	100	84	95	98	100	100	100	98	93	94	96	89	2	Student 1	✓	Student 1	Student 1	93			100	75	100	100	100	
14	56	71	71	68	45	72	24	79	79	76	66	55	10	Student 2	✓	Student 2	Student 2	67			100	100	93	100	100	
2	93	85	90	91	100	99	55	80	83	88	91	76	4	Student 3	✓	Student 3	Student 3	87			100	83	100	100	100	
8	98	58	90	82	100	70	38	63	29	83	78	37	8	Student 4	✓	Student 4	Student 4	70			100	0	100	100	0	



Rank/13	Check column		Last Name	First Name	% Co	Enter the topic area using the dropdown	all	Thermal	Thermal	Ther
						Enter source, AL or GCSE or PS (problem solving)	all	GCSE	AL	CS
						⇦ class average	class average ⇨	80.2	AL	7
						Y12-4 2019-21	All		PS	
									GCSE	31
						paste in ⇒	Assignments for 'Y12-4 2019-21' (20986)			
							Downloaded on Mon Jul 06 09:58:28 UTC			
							Generated by: Nick Z-Davies			
				Due				19-Jun	22-Jun	22-
2	Student 1	✓	Student 1	Student 1	93			100	75	1
10	Student 2	✓	Student 2	Student 2	67			100	100	

How does the Isaac download worksheet work?



How many boards are set on each topic

The class averages

boards that haven't been started, or are below thresholds

Performance in each topic

- Performance on GCSE questions
- Performance on A Level skills questions
- Performance on problem solving questions

Main mark-book worksheet

Not started?	Boards < 60	Boards < 80	Boards < 90	IP Rank	Dec 21 Mock		Jun 22 Mock		Jan 23 Mock		Apr 23 Mock		Shared with TA	Target band	IP old	IP new	Inc	IP23,24/25	
					48%	D	65%	C	61%	C	57%	B	class average →		88.1	87.9	-0.1	87	98
													13-1 TH7DF3						
12	38	54	64	15	21%	U	39%	E	36%	E	71%	A	s2	B-C	79	78	-1	84	93
0	0	0	0	1	43%	D	59%	C	53%	D	31%	E	s3	A	100	99	-1	100	100
1	10	26	33	6	40%	E	53%	C	65%	C	42%	D	s4	A	94	93	-1	32	100

I add class code to class name.

Main mark-book worksheet

												29-Apr	06-Jun		12-Jun	06-Jul	
					66%	5.8	-9%	73%	6.7	Shared with TC & CS	1	89.0	89.6	1.2	23	72	47
IP rank	HW not dc	bds on 0	bds <60	Y10W.T			Inc	Dec19 mock		10 Curie 7F, 18M *L24864*	Seneca	IP old	IP new	IP inc	SEN ECA old	SEN ECA new	diff
13	3	0	1	30	83%	7	1%	86%	8	s19	Yes	90	90		21	78	57
23	8	5	6	22	61%	6	-10%	68%	6	s20	No	82	77	-5			0
6	2	0	0	22	61%	6	-4%	45%	4	s21	Yes	98	98		46	114	68
21	1	0	0	21	58%	5	-11%	68%	6	s22	Yes	81	82	1	12	73	61
18	4	2	2	15	42%	4	-33%	86%	8	s23	Yes	88	89	1	34	107	73
17	8	0	0	21	58%	5	-6%	77%	7	s24	Yes	86	85	-1	0	0	0
16	1	2	2	24	67%	6	-7%	57%	5	s25	Yes	91	92	1	34	65	31
				9	95%	0											
				8	84%	3											
				7	72%	5											
				6	60%	9											

Rank within class

Main mark-book worksheet

													29-Apr	06-Jun		12-Jun	06-Jul	
					66%	5.8	-9%	73%	6.7	Shared with TC & CS	1	89.0	89.6	1.2	23	72	47
IP rank	HW not dc	bds on 0	bds <60	Y10W.T			Inc	Dec19 mock		10 Curie 7F, 18M L24864	Seneca	IP old	IP new	IP inc	SEN ECA old	SEN ECA new	diff
13	3	0	1	30	83%	7	1%	86%	8	s19	Yes	90	90		21	78	57
23	8	5	6	22	61%	6	-10%	68%	6	s20	No	82	77	-5			0
6	2	0	0	22	61%	6	-4%	45%	4	s21	Yes	98	98		46	114	68
21	1	0	0	21	58%	5	-11%	68%	6	s22	Yes	81	82	1	12	73	61
18	4	2	2	15	42%	4	-33%	86%	8	s23	Yes	88	89	1	34	107	73
17	8	0	0	21	58%	5	-6%	77%	7	s24	Yes	86	85	-1	0	0	0
16	1	2	2	24	67%	6	-7%	57%	5	s25	Yes	91	92	1	34	65	31

9	95%	0
8	84%	3
7	72%	5
6	60%	9

I like to know who has not started a board

Student #20 has 5 boards with zero progress.

and 6 boards below 60% (trilogy group)

Main mark-book worksheet

| | | |

Main mark-book worksheet

Shared with TA		27-Jan	27-Feb	31 days
class average →		88.1	87.6	-0.5
13-1 TH7DF3	Target band	IP old	IP new	Inc
s2	B-C	79	72	-7
s3	A	100	99	-1
s4	A	94	93	-1
s5	B-C	80	92	12

⇦ Class average score

⇦ issue?

⇦ needs recognition

About once a month, I manually cut and paste the overall% scores for each student – and date it,

Homework status

	11-Mar	18-Mar
Shared with TC & CS	81.8	94.7
10 Curie 7F, 18M *L24864*	IP12	
s10	0	100
s11	23	100
s12	100	100
s13	96	96
s14	98	100
s15	56	100
s16	93	93
s17	0	93

⇦ Date set / due

I always give them one week to do Isaac Physics

left hand side: pasted values from the day homework is due (18th March)

right hand side formula: current status (latest IP download)

GCSE mixed ability classes

Key board	9	A Bold year indicator means that this is one of the 'key boards' to be set																			
Step Up to GCSE		GCSE Trilogy						Quiz		*Y7&8 board*		Note some B Quizzes are omitted, they could be set as extension questio									
Skills		**Energy**		**Electricity**		**Particles**		**Atomic Structure**		**Mechanics**		**Waves & Optics**		**Magnetism**	
1. units (Y9, Y10F)	9	Work done Quiz A	9	22 Q=It F	9	Density Quiz A	9	51 atomic numbers F	10	Weight Quiz A	9	Waves Quiz A	9	F = BIL Quiz A	11
5 Variables & constants	9	9-24 Work	9	Q & I Quiz A	9	9-30 Density	9	52 rad. decay F	10	9-11 Weight & F-res	9	9-35 Frequency	10		
6 straight line graphs F	9	9-26 Power	9	9-18 Q=It 1	9	9-31 Floating	9	53 half life F	10	8 s, v, t F	9	9-36 λ, v = fλ	10		
7 proportionality F	10	9-27 Energy flow & eff	9	9-17 V in circuits	10	9-34 Pressure	9	Half life Quiz A	10	9-2 Units of distance	9	38 wave props F	10		
2 standard form F	10	Power & Energy Quiz A	10	9-20 Current	10	SHC Quiz A	10	Half life Quiz B	11	Speed Quiz A	9	38A add. wave F	10		
Practical skills GCSE	11	Power & Energy Quiz B	10	22A add. Q&I F	10	9-29 Energy & Temp	10			9-28 Bal & moments	9	Waves Quiz B	10		
9-20 Large/small Nos	9	GPE Quiz A	11	Q & I Quiz B	10	30 thermal energy F	10			8A addl s, v, t F	10	9-46.1 Waves SQ	10		
		GPE Quiz B	11	23 circuit rules F	10	30A add. Thermal F	10			Weight Quiz B	10	9-46.2 Waves SQ	11		
		9-25 GPE	11	9-23 Sharing voltage	10	31 latent heat F	10			9-33 Springs	10	9-37 Echoes	11		
		34 kinetic energy F	11	Resistance Quiz A	10	Latent heat Quiz A	10			37 springs F	10				
		KE Quiz A	11	24 resistance F	10	Density Quiz B	11			Springs Quiz A	10				
		36 power & body F	11	9-21 Resistance	10	SHC Quiz B	11			10 s-t graphs F	10				
		33 work PE, power F	11	Series res. Quiz A	10	59 Boyle's law F	11			9-4 Velocity	10				
		EPE Quiz A	11	25 IV graphs F	11					9-6 Calc velocities	10				
		EPE Quiz B	11	26 power F	11					11 acceleration F	10				
		35 efficiency F	11	27 R & Power F	11					Acceleration quiz A	10				

Boards with an F suffix involve only the easier questions.
This is an alternative to the quick boards available on the Isaac Physics website. Boards are all hyper-linked.
I rarely set B quizzes for mixed ability groups.

Not all GCSE boards are in this selection

GCSE Higher students

Step Up to GCSE		GCSE Trilogy		Separates only		Quiz		Y7&8 board							
Skills		**Energy**		**Electricity**		**Particles**		**Atomic Structure**		**Mechanics**		**Waves & Optics**		**Magnetism**	
1 units	9	Work done Quiz A	9	22 Q=It	9	Density Quiz a	9	51 atomic numbers	10	Weight Quiz a	9	Waves Quiz a	9	F = BIL Quiz A	11
2 standard form	9	9-24 Work	9	Q & I Quiz A	9	Density Quiz b	9	52 rad. decay	10	Weight Quiz b	9	9-35 T & f	9	F = BIL Quiz B	11
5 Variables & constants	9	9-26 Power	9	Q & I Quiz B	9	9-30 Density	9	53 half life	10	9-11 Weight & F-res	9	9-36 λ, v = fλ	9	28 EM ind'n & gen (H)	S
9-5 Re-arr equations	9	9-27 E flow & eff	9	9-18 Q=It 1	9	9-31 Floating	9	Half life Quiz A	10	8 s, v, t	9	38 wave props	10	29 transformers	S
1A add. units	10	Power & Energy Quiz A	9	9-20 Current	10	9-34 Pressure	9	Half life Quiz B	10	9-2 Units of distance	9	38A add. wave props	10		
6 straight line graphs	10	Power & Energy Quiz B	10	9-17 V in circuits	10	SHC Quiz A	10	55 fission reactor	S	Speed Quiz A	9	Waves Quiz B	10		
7 proportionality	10	work done Quiz B	10	22A add. Q & I	10	9-29 Energy & Temp	10			9-28 moments	9	9-46.1 Waves SQ	10		
7A add. proportionality	10	33 work PE,power	11	23 circuit rules	10	30 thermal energy	10			8A addl s, v, t (H)	10	9-46.2 Waves SQ	11		
Practical skills GCSE	11	GPE Quiz a	11	Series res. Quiz A	10	SHC Quiz B	10			Springs Quiz A	10	9-37 Echoes	11		
3 rearr. equations	11	9-25 GPE	11	24 resistance	10	30A add. Th. energy	10			9-33 Springs	10	39 reflection plane	S		
9-47 challenge Qs	11	GPE Quiz b	11	Resistance Quiz A	10	31 latent heat	10			37 springs	10	45 seismic waves	S		
9-48 Dimens. Anal	11	34 kinetic energy	11	9-21 Resistance	10	Latent heat Quiz A	10			Springs Quiz B	10	48 convex lenses	S		
9-20 Large/small Nos	9	KE Quiz a	11	9-23 Sharing p.d.	10	Latent heat Quiz B	11			10 s-t graphs	10	49 concave lenses	S		
		KE Quiz B	11	9-16 E=QV	10	59 Boyle's law	11			9-3 s-t graphs	10				
		35 efficiency	11	25 IV graphs	11	29 Heat Cap'y (HC)	11			9-4 Velocity	10				
		35A add. efficiency	11	26 power	11					9-6 Calc velocities	10				
		36 power & body	11	27 Res & Power	11					11 acceleration	10				
		EPE Quiz A	11	P = IV Quiz A	11					Acceleration quiz A	10				
		EPE Quiz B	11	P = IV Quiz B	11					9-8 Acceleration	10				

Track each class - GCSE

Step Up to GCSE		Y9-11 Trilogy		Separates only		Quiz									
Skills		**Energy**		**Electricity**		**Particles**		**Atomic Structure**		**Mechanics**		**Waves & Optics**		**Magnetism**	
1 units	9	Work done Quiz A	9	22 Q=It	9	Density Quiz a	9	51 atomic numbers	10	Weight Quiz a	9	Waves Quiz a	9	F = BIL Quiz A	11
2 standard form	9	9-24 Work	9	Q & I Quiz A	9	Density Quiz b	9	52 rad. decay	10	Weight Quiz b	9	9-35 T & f	9	F = BIL Quiz B	11
5 Variables & constants	9	9-26 Power	9	Q & I Quiz B	9	9-30 Density	9	53 half life	10	9-11 Weight & F-res	9	9-36 λ, v = fλ	9	28 EM ind'n & gen (H)	S
9-5 Re-arr equations	9	9-27 E flow & eff	9	9-19 Large/small Nos	9	9-31 Floating	9	Half life Quiz A	10	8 s, v, t	9	38 wave props	10	29 transformers	S
1A add. units	10	Power & Energy Quiz A	9	9-20 Current	10	9-34 Pressure	9	Half life Quiz B	10	9-2 Units of distance	9	38A add. wave props	10		
6 straight line graphs	10	Power & Energy Quiz B	10	9-17 V in circuits	10	SHC Quiz A	10	55 fission reactor	S	Speed Quiz A	9	Waves Quiz B	10		
7 proportionality	10	9-29 Energy & Temp	10	22A add. Q & I	10	30 thermal energy	10			9-28 moments	9	9-46.1 Waves SQ	10		
7A add. proportionality	10	work done Quiz B	10	23 circuit rules	10	SHC Quiz B	10			8A addl s, v, t (H)	10	9-46.2 Waves SQ	11		
Practical skills GCSE	11	33 work PE,power	11	Series res. Quiz A	10	30A add. Th. energy	10			37 springs	10	9-37 Echoes	11		
3 rearr. equations	11	GPE Quiz a	11	24 resistance	10	31 latent heat	10			Springs Quiz A	10	39 reflection plane	S		
9-47 challenge Qs	11	9-25 GPE	11	9-21 Resistance	10	Latent heat Quiz A	10			Springs Quiz B	10	45 seismic waves	S		
9-48 Dimens. Anal	11	GPE Quiz b	11	9-23 Sharing p.d.	10	Latent heat Quiz B	11			10 s-t graphs	10	48 convex lenses	S		
		34 kinetic energy	11	9-18 Q=It 1	10	59 Boyle's law	11			9-3 s-t graphs	10	49 concave lenses	S		
		KE Quiz a	11	Resistance Quiz A	10	17 pressure	S			9-4 Velocity	10				
		KE Quiz B	11	25 IV graphs	11	17A Add Pressure	S			9-6 Calc velocities	10				

Allows me to keep a track of what I have set for classes

Track each class – A Level

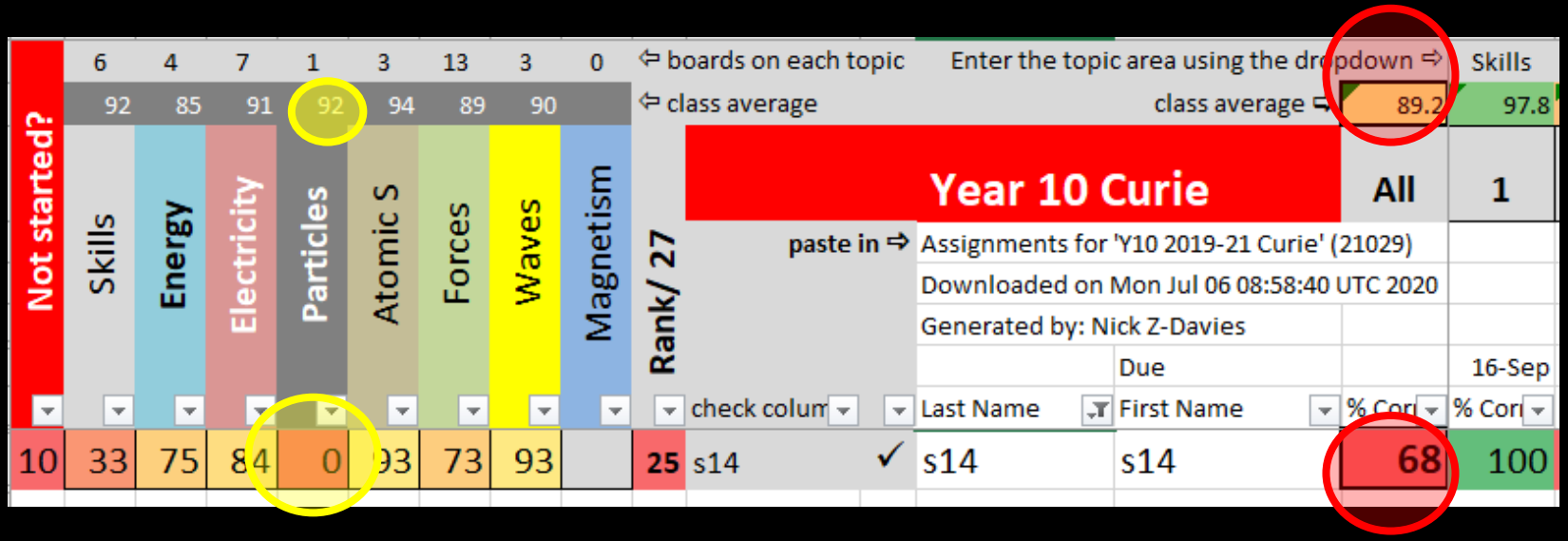
out of spec	AL book	GCSE board	Quiz	PS boards							
Skills	Mechanics	Materials	Circuits	Waves	Particles/ quantum	Periodic M	Gases & thermal	Fields	Capacitors	Nuclear Physics	Astrop
A1 re-arranging equations	9 displacement	Density	22 Charge & Current	38 wave props	D6 photoelectric effect	18 moving in circle	G1 Kelvin scale of temperature	F5 newtonian gravity	I1 Charge and energy stored	51 atomic numbers	Telescop
A2 derived and base SI units	13 Fres & acc	37 Springs	23 circuit rules	39 reflection plane mirrors	The Photoelectric effect	Radians and Geometry	30A additional thermal energy	F6 Gravity & Orbits	I2 Capacitor networks	52 radioactive decay	D1 Amp Inten As
A3 standard form and prefixes	14 terminal V	B7 Springs	24 resistance	40 reflection concave	D7 quantum calculations	F3 units of rotary motion	31 latent heat	Gravitational Fields L4	I3 Discharge of a capacitor	53 half life	Star cla
A4 converting units	15 stopping	B6 stress, strain & Young's mod	25 IV char	42 refraction	Quantum Calculations	Circular mtn & ang vel ND	G3 Heat Capacity	Gravity and orbits	Charging capacitors	Half life Quiz B	Spectra qu
A5 Gradients & graph intercepts	17 pressure	B9 Energy. Springs, mats	IV characteristics	Wave motion	D9 Energy levels	F4 centripetal acceleration	G4 Latent heat and heat cap	H1 uniform electric fields	Discharging a capacitor	J1 Nuclear equations	L7 S
A6 Equations of graph	B1 components of a vector	Materials 345	26 power	Electromagnetic spectrum	L2 Fundamental particles & inter.	Centripetal force	59 Boyle's law	H2 E field near point charges	Capacitor ac	J2 Activity and decay	K1 red Hubbl
A7 area under a graph	B2 adding vectors		27 R & P	D3 path difference	L6 MRI & PET scanning	F7 oscillators	60 pressure law	H3 speed of electron in E field	Capacitors in series & parallel	J3 Nuclear decay with time	Dopple (ha
A8 area under a graph II	Resolving vectors		Electrical power	wave equation		SHM time period	61 Charles' law	Electrons in E field		K2 Exponential extrapolation	L8 Histo univ
A9 Factor & % Changes	Adding Vectors ND v2		GCSE Hard Electricity	D4 interference		SHM2	62 general gas law	Properties E fields		J4 Energy in nuc. reactions	Stars a

Parental contact (1)

												29-Apr	06-Jun		12-Jun	06-Jul	
					66%	5.8	-9%	105%	6.5	Shared with TC & CS		87.7	89.6	3.7	23	72	47
IP rank	HW not done	bds on 0	bds <60	Y10W.T			Inc	Dec19 mock		10 Curie 7F, 18M *L24864*		IP old	IP new	IP inc	SEN ECA old	SEN ECA new	diff
25	6	4	4	22	61%	6	-24%	61%	6	s14		61	65	4	88	113	25
				9	95%	0		9	2								
				8	84%	3		8	5								
				7	72%	5		7	7								
				6	60%	9		6	6								
				5	50%	4		5	4								
				4	40%	2		4	1								
				3	30%	1		3	0								
				2	20%	0		2	0								
				1	10%	0		1	0								

Main mark-book worksheet

Parental contact (2)

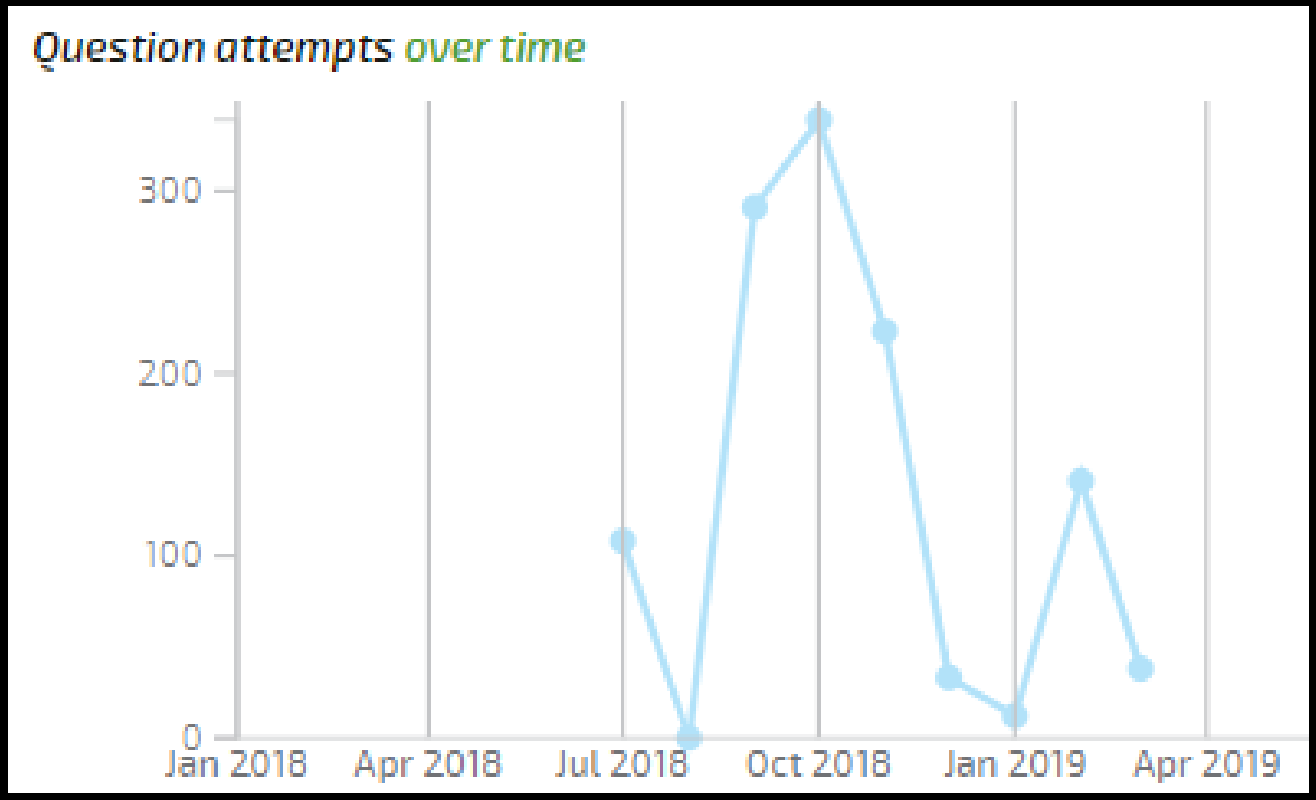


Not started?	Skills	Energy	Electricity	Particles	Atomic S	Forces	Waves	Magnetism	Rank/ 27					
6	4	7	1	3	13	3	0	⇦ boards on each topic		Enter the topic area using the dropdown ⇨			Skills	
92	85	91	92	94	89	90		⇦ class average		class average ⇨		89.2	97.8	
									Year 10 Curie			All	1	
								paste in ⇨	Assignments for 'Y10 2019-21 Curie' (21029)					
									Downloaded on Mon Jul 06 08:58:40 UTC 2020					
									Generated by: Nick Z-Davies					
										Due			16-Sep	
								check colum	Last Name	First Name	% Cor		% Cor	
10	33	75	84	0	93	73	93	25	s14	✓	s14	s14	68	100

1. Compare student's overall% (All) with class average
2. Compare student's Particle% with class average

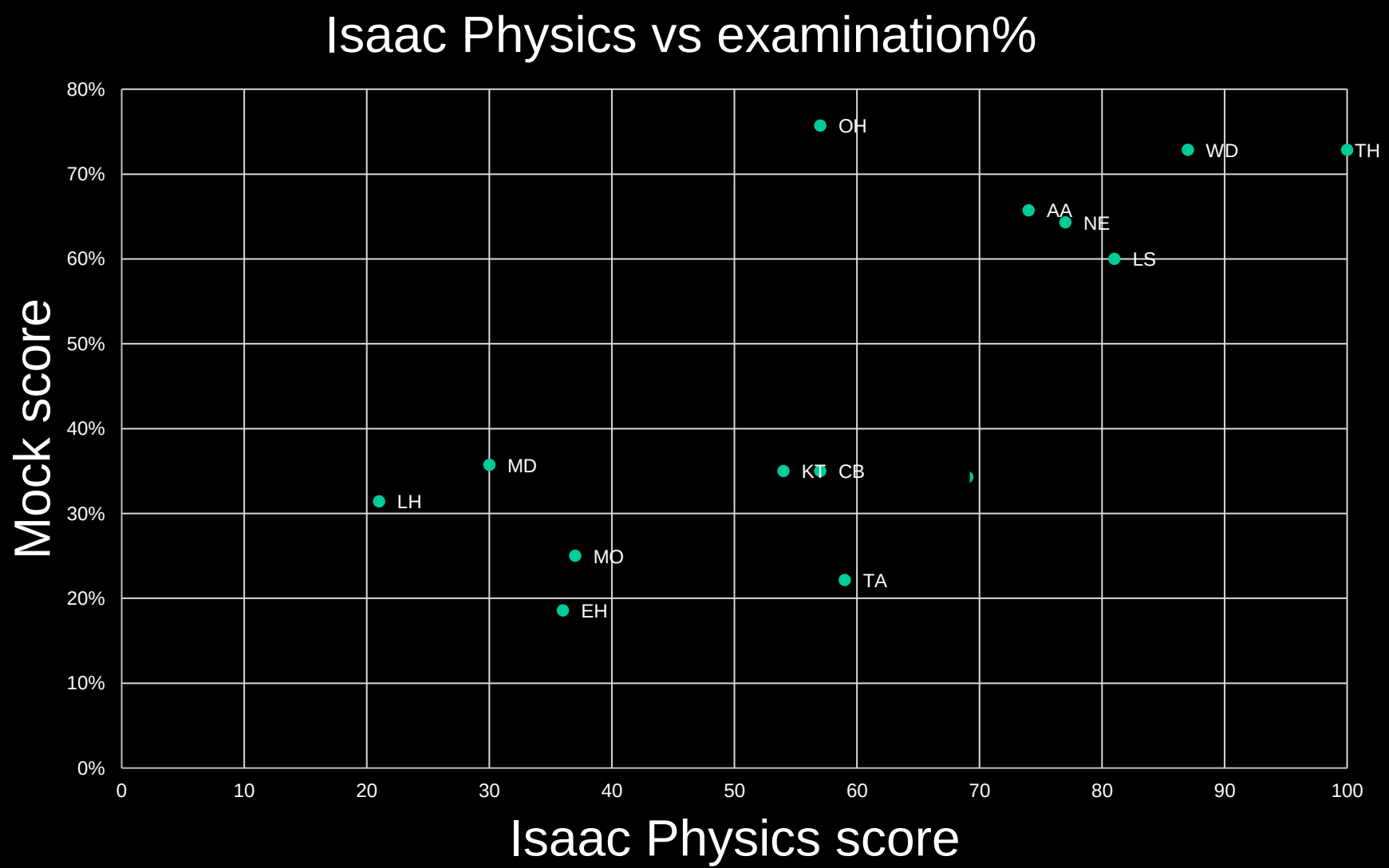
Isaac Download worksheet

Trend analysis



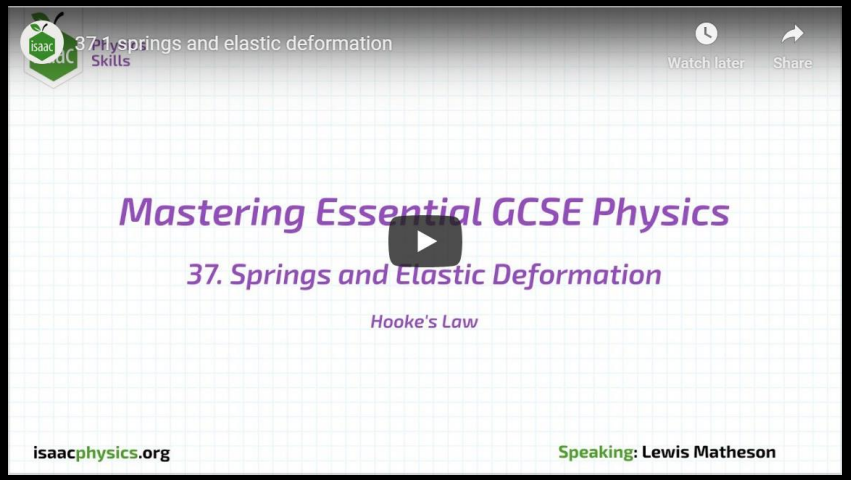
Go to *Manage Groups* on Isaac, select relevant *class* and then click on the student's name and scroll down.

Graphs for leadership

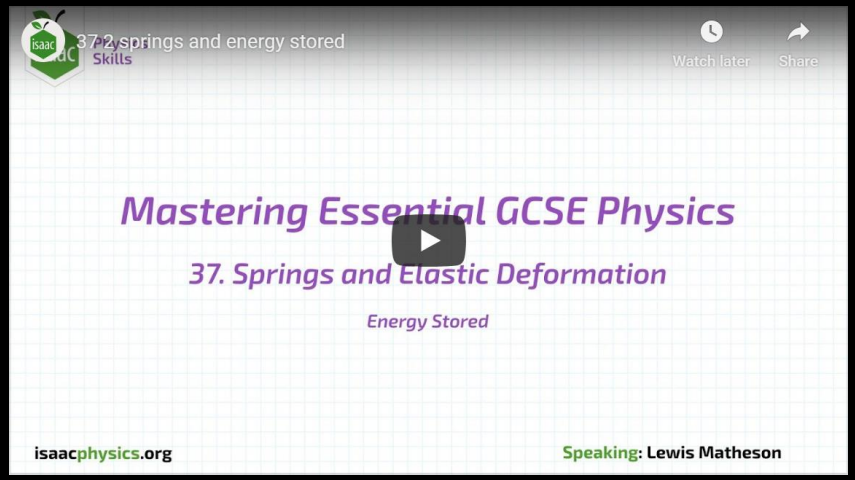


Relevant Isaac Physics questions

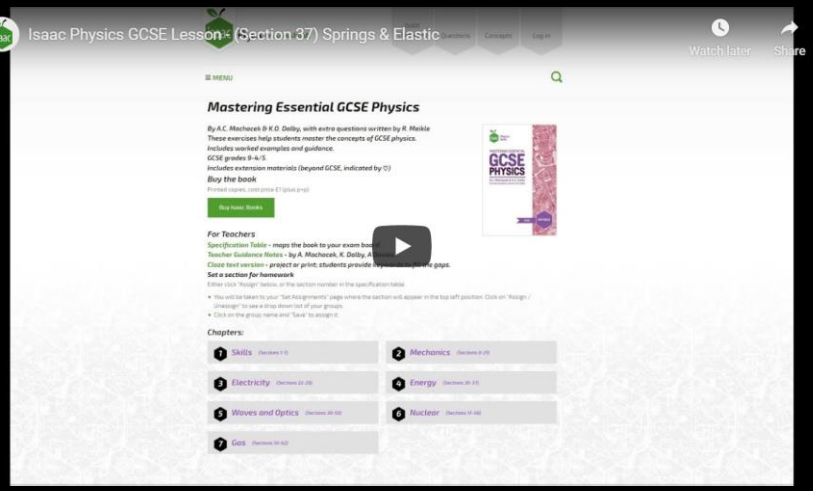
- 37 springs



(3:07)



(2:15)



(Tutorial 27:13)

My view of

- ✓Helps understanding of strengths & weaknesses
- ✓Saves huge amount of time,
- ✓re-invest saved time in formative assessment.
- ✓Harder for students to copy work (in registration)
- ✓Improves my subject knowledge

✓ Isaac Physics at WHS:

- ✓Physics - fully integrated
- ✓Chemistry – rapidly improving (A Level)
- ✓Maths – only really used by Physics dept.
- ✓Biology – developing now (A Level)

✓ Useful for spaced learning.

(minor) Issues with

- ☹ Start with numeric boards
  - ☹ Demonstrate equation editor to class.
  - ☹ Equation editor on phones can be challenging
- ☹ Don’t set boards you can’t do!
- ☹ Many students, initially, did not like the switch to IP.
  - ☹ Parents wrote, asking to switch back to written work.
    - ☹ IP is hard to copy in morning registration.
  - ☹ Don’t like lack of feedback about what is wrong.
  - ☹ Some struggle to understand that they need to learn to struggle!
  - ☹ Girls seem not to like it as much as boys (anecdotal)

Exam analysis tool

Nothing to do with Isaac Physics*

Enter maximum marks for question part ⇨		85			37	25	23	31	3	11	11	20	9						
SET N°	Jan 2020 Y13 A level mock	Total		Grade	Calc	Desc	Recall	Mech	Mat	elec	Part	Waves	Per	Multiple Choice		Silly errors	SE%	% with no SE	grade no SE
2	Student X	61	71.8%	B	81%	56%	74%	90%	67%	36%	91%	60%	56%	16	64%	10	12%	84%	A
	Cohort average	49.7	58.5%	C	66%	44%	63%	63%	68%	39%	71%	55%	56%	16	65%	8.8	10%	71%	B
					B	D	B	B	B	D	B	C	C		B	Add up silly errors	% SE	Add SE% to %score	

Recall = things to LEARN
Desc = describe / explain
Calc = calculation questions

Mech = mechanics
Mat = materials
Elec = electricity
Part = Particles, quantum
Atom = atomic structure
Per = circular motion, SHM
Wave = Waves
Mag = magnetism
Space = Space physics
HSW = practicals

Grade distribution

A*	4
A	4
B	13
C	4
D	6
E	5
U	2

Grade Boundaries

A*	84%
A	72.4%
B	60%
C	49%
D	37%
E	26%
U	0%

Grade distribution

A*	4
A	15
B	2
C	10
D	1
E	0
U	0

* Other than the fact that Isaac buys me the time to do this.

File template available email me: ndavies@wilmslowhigh.com