Formative feedback

Gathering assessment data to inform teaching and provide individualised feedback to students using Excel and Word's Mail Merge

Claire Rollinson 2024

Image source: https://garden.lovetoknow.com/image/254882~watering.jpg

Motivations and the end product

- What do you hope to learn today?

My motivations:

- Students tend to focus on the mark rather than what can be learned from a task
- A visual representation of strengths and areas for improvement can be more informative than a grade
- There is rarely time available in class to give each student detailed feedback
- Each task is a valuable opportunity to promote learning development
- Gathering assessment data informs teaching and enables improved practice

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Year 10 Physics Semester 2 2022
Test 1: Vectors and Motion
Name: Student 2
Class: 10SPH02

Ch	Description	Q^ns	Marks awarded	Marks available	Achievement: Revision needed	Achievement: Good: revision advised	Achievement: Very Good: revision advised	Achievement: Excellent
8.2	Adding vectors in one and two dimensions	8,10	1	2		●		
8.3	Subtracting vectors in 1 and 2 dimensions	9	1	1				●
8.4	Vector components	12,14	4	5			●	
9.1	Displacement, speed and velocity	1,4,15ab	2	4		●		
9.2	Acceleration	5,11	1	2		●		
9.3	Graphing position, velocity & acc^n over time	7,13	6	7			●	
9.4	Equations for uniform acceleration	15cd	0	3	●			
9.5	Vertical motion	2,3,6	3	3				●
	Deduction for incorrect direction		0					
	Deduction for incorrect units		0					
	Total marks awarded (out of 27)		18					
	Scaled grade		C+					

Feedback:
Well done Student 2. You have demonstrated a good understanding of the content covered in the vectors and motion topics.

- As in Q1, you are adding vectors well in 1 dimension and considering vector directions effectively.
- As in Q2, you are analysing vertical motion problems effectively.
- As in Q3, you are correctly identifying that the acceleration due to gravity near Earth's surface is constant at 9.8 m/s^2 downwards toward the centre of Earth.
- As in Q4, remember to read questions carefully and that constant velocity means a = 0.
- As in Q5, you are correctly finding acceleration as the change in velocity (i.e. $\Delta v = v - u$) divided by the time interval.
- As in Q6, you are correctly identifying that a dropped object will start from rest and then accelerate due to gravity with an acceleration of g = 9.8 m/s^2 near Earth's surface if air resistance is ignored.
- As in Q7, you are correctly identifying that the acceleration of an object at a particular moment in time is given by the gradient (i.e. rise/run) of the tangent to the velocity-time graph.

Generating automated feedback

- By collecting the marks awarded for each question on a task, we can use Excel to generate automated achievement-by-topic data for each student
- We can then use Word's mail merge function to generate an individualised report for each student
- General feedback for each correct/incorrect question can be generated and then adjusted for each student

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8.4	Vector components	12,14	4	5			●	
9.1	Displacement, speed and velocity	1,4,15ab	2	4		●		
9.2	Acceleration	5,11	1	2		●		
9.3	Graphing position, velocity & accn over time	7,13	6	7			●	
9.4	Equations for uniform acceleration	15cd	0	3	●			
9.5	Vertical motion	2,3,6	3	3				●
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The files

- To download these slides along with the Excel and Word templates go to:

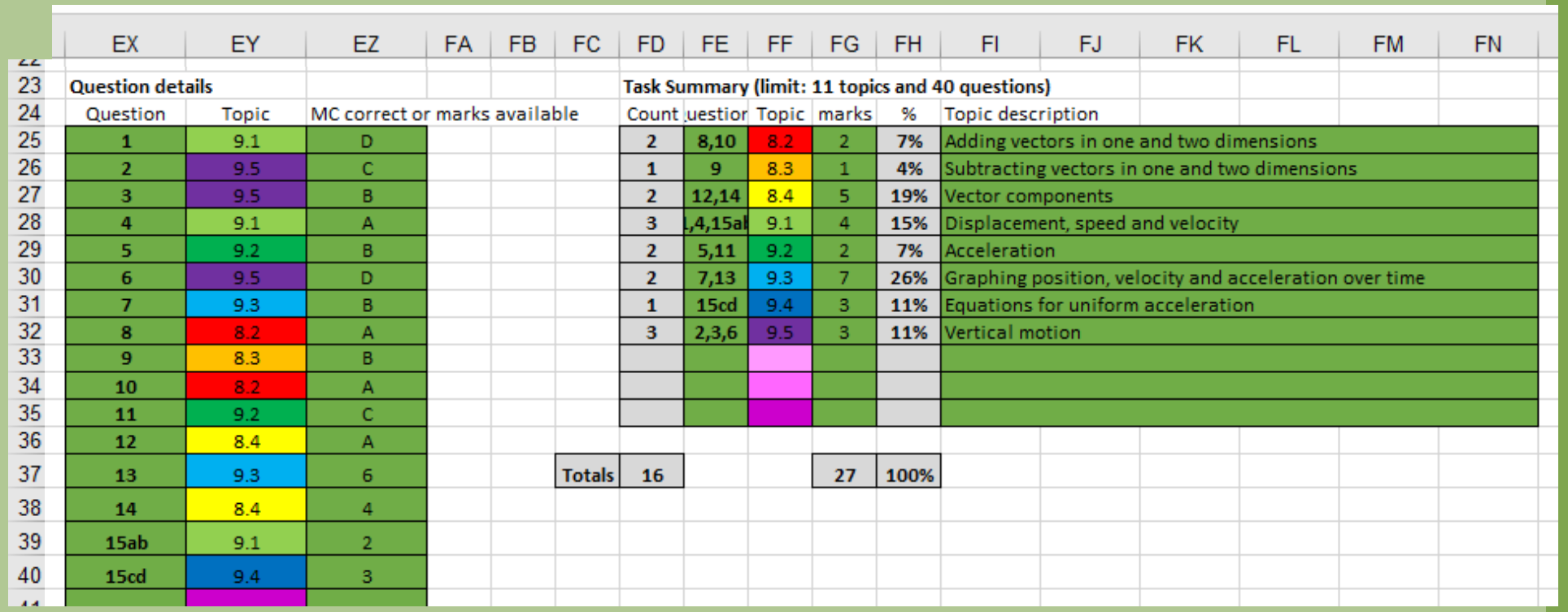
https://github.com/clairerollinson/auto-feedback-for-students

- Download the Excel template and enter class details on the Summary tab

	A	B	C	D	E	F	G	H	I	J
1	Enter teacher code, class code, student IDs, full names with form and preferred names below						Year to date Average	Research project	Research project	Practical investigation
2	Email	Teache	Class	ID Cod	Name	Preferred	YTD	A01	A02	A03
3	STU0001@macrob.vic.edu.au	ROL	10SPH02	STU0001	Student 1	Student 1	81%	81%		
4	STU0002@macrob.vic.edu.au	ROL	10SPH02	STU0002	Student 2	Student 2	67%	67%		
5	STU0003@macrob.vic.edu.au	ROL	10SPH02	STU0003	Student 3	Student 3	44%	44%		
6	STU0004@macrob.vic.edu.au	ROL	10SPH02	STU0004	Student 4	Student 4	93%	93%		
7	STU0005@macrob.vic.edu.au	ROL	10SPH02	STU0005	Student 5	Student 5	78%	78%		
8	STU0006@macrob.vic.edu.au	ROL	10SPH02	STU0006	Student 6	Student 6	70%	70%		
9	STU0007@macrob.vic.edu.au	ROL	10SPH02	STU0007	Student 7	Student 7	85%	85%		
10	STU0008@macrob.vic.edu.au	ROL	10SPH02	STU0008	Student 8	Student 8	81%	81%		

The process in Excel

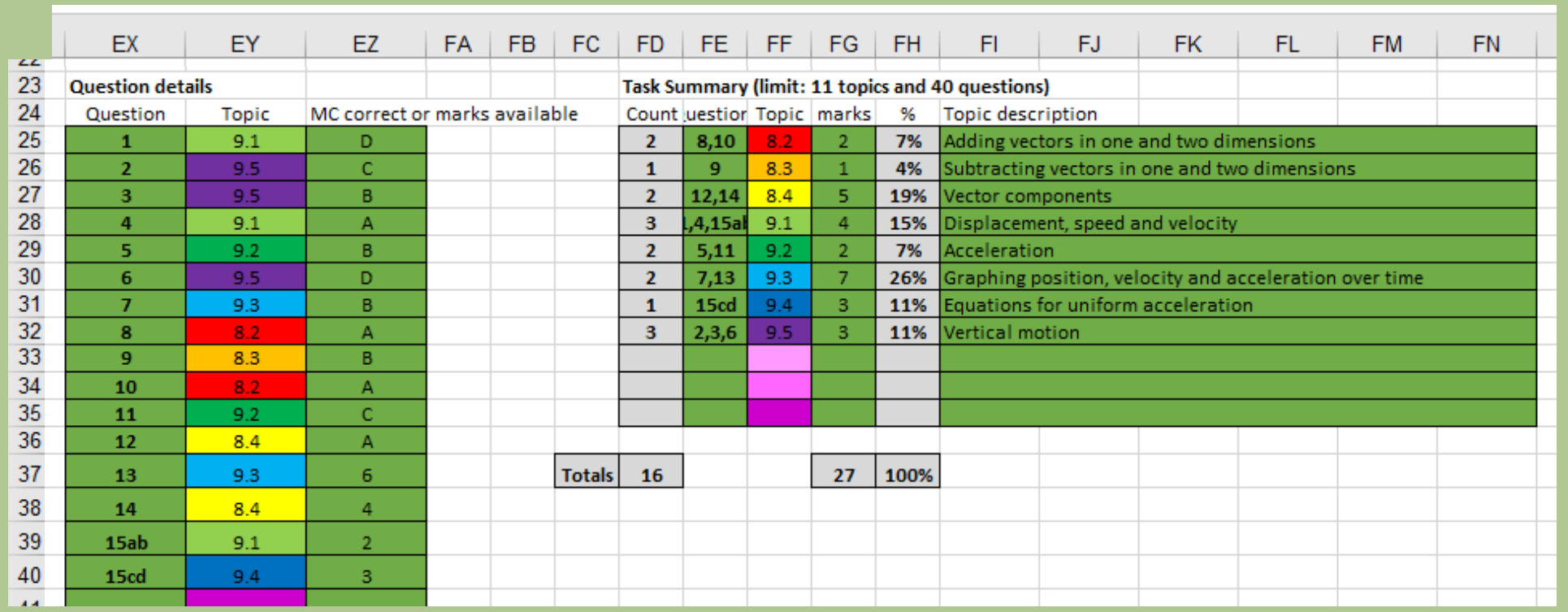
- Go through the assessment task, identify the topics covered in each question
- Choose a tab for the assessment task such as “A01” in the Excel file
- The next step in Excel is to adjust the topics in the rainbow cells from FF25:FF35
- The spreadsheet is set up for a maximum of 11 topics and 40 questions per task
- Adjust green cells only (apart from FF25:FF35 and EY25:EY64)



	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN
23	Question details						Task Summary (limit: 11 topics and 40 questions)										
24	Question	Topic	MC correct or marks available				Count	uestion	Topic	marks	%	Topic description					
25	1	9.1	D				2	8,10	8.2	2	7%	Adding vectors in one and two dimensions					
26	2	9.5	C				1	9	8.3	1	4%	Subtracting vectors in one and two dimensions					
27	3	9.5	B				2	12,14	8.4	5	19%	Vector components					
28	4	9.1	A				3	,4,15al	9.1	4	15%	Displacement, speed and velocity					
29	5	9.2	B				2	5,11	9.2	2	7%	Acceleration					
30	6	9.5	D				2	7,13	9.3	7	26%	Graphing position, velocity and acceleration over time					
31	7	9.3	B				1	15cd	9.4	3	11%	Equations for uniform acceleration					
32	8	8.2	A				3	2,3,6	9.5	3	11%	Vertical motion					
33	9	8.3	B														
34	10	8.2	A														
35	11	9.2	C														
36	12	8.4	A														
37	13	9.3	6			Totals	16			27	100%						
38	14	8.4	4														
39	15ab	9.1	2														
40	15cd	9.4	3														

The process in Excel

- Once cells FF25:FF35 are completed, complete the ‘Question details’ from EX23 down
- Adjust the cells in columns EX:EZ under the headings ‘Question’, ‘Topic’ and ‘MC correct or marks available’
- The colours of the ‘Topic’ cells in column EY will auto-update as per the topic colours in column FF
- Now complete ‘Task Summary’ section in FD23



	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN
23	Question details						Task Summary (limit: 11 topics and 40 questions)										
24	Question	Topic	MC correct or marks available				Count	uestion	Topic	marks	%	Topic description					
25	1	9.1	D				2	8,10	8.2	2	7%	Adding vectors in one and two dimensions					
26	2	9.5	C				1	9	8.3	1	4%	Subtracting vectors in one and two dimensions					
27	3	9.5	B				2	12,14	8.4	5	19%	Vector components					
28	4	9.1	A				3	,4,15al	9.1	4	15%	Displacement, speed and velocity					
29	5	9.2	B				2	5,11	9.2	2	7%	Acceleration					
30	6	9.5	D				2	7,13	9.3	7	26%	Graphing position, velocity and acceleration over time					
31	7	9.3	B				1	15cd	9.4	3	11%	Equations for uniform acceleration					
32	8	8.2	A				3	2,3,6	9.5	3	11%	Vertical motion					
33	9	8.3	B														
34	10	8.2	A														
35	11	9.2	C														
36	12	8.4	A														
37	13	9.3	6			Totals	16			27	100%						
38	14	8.4	4														
39	15ab	9.1	2														
40	15cd	9.4	3														

The process in Excel

- If including comments: Mark all tasks by hand before entering the marks so that you get an idea of general feedback or advice to be offered for each question
- Adjust the ‘General advice for achievement’ section as required in EQ11 and EQ12
- Adjust the ‘Task description’ in EQ21
- Adjust the advice for achieving ‘Full marks’ on each question from EQ25 down
- Adjust the advice for ‘Full marks not awarded’ on each question from ER25
- Comments will be generated for each student from AY10 when marks are entered

Feedback:
Well done Student 2. You have demonstrated a good understanding of the content covered in the vectors and motion topics.

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- As in Q4, remember to read questions carefully and that constant velocity means a = 0.

	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY
10	**General advice for achievement**									
11	<50%	A great effort								
12	>50%	Well done								
13										
14	0	You have demonstrated some understanding								
15	0.45	You have demonstrated a good foundation in your understanding								
16	0.5	You have demonstrated a good foundation in your understanding								
17	0.6	You have demonstrated a good understanding								
18	0.7	You have demonstrated a very good understanding								
19	0.9	You have demonstrated an excellent understanding								
20	1	You have demonstrated an excellent understanding								
21	**ısk description**	of the content covered in the vectors and motion topics.								
22										
23	**General advice for each question**								**Question details**	
24	Question	Full marks	Full marks not awarded						Question	Topic
25	1	As in Q1, you	As in Q1, rem						1	9.1
26	2	As in Q2, you	As in Q2, rem						2	9.5
27	3	As in Q3, you	As in Q3, rem						3	9.5
28	4	As in Q4, you	As in Q4, rem						4	9.1
29	5	As in Q5, you	As in Q5, rem						5	9.2
30	6	As in Q6, you	As in Q6, rem						6	9.5
31	7	As in Q7, you	As in Q7, rem						7	9.3
32	8	As in Q8, you	As in Q8, rem						8	8.2
33	9	As in Q9, you	As in Q9, rem						9	8.3
34	10	As in Q10, yo	As in Q10, re						10	8.2
35	11	As in Q11, yo	As in Q11, re						11	9.2
36	12	As in Q12, yo	As in Q12, re						12	8.4

The process in Excel

- Once your task details are entered, the question numbers, their topics and the correct MC options or full marks per question will appear in rows 2, 3 and 9 respectively
- Do not edit rows 1-9; edit details from cell EX23 as shown on previous slides
- If any columns are not required, leave them blank (deleting will mess up formulae)
- Unhide columns between X and AS if more question columns are required
- Enter the multiple choice options and marks awarded for each student from column E
- Any deductions (i.e. sig figs, directions, units etc) are entered as negative values
- Enter '0' for any omitted multiple choice questions

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	AS	AT	AU
1		class		name	m1	m2	m3	m4	m5	m6	m7	m8	m9	m10	m11	m12	m13	m14	m15	m16	m17	m18	m19	m20	sigfigs	d	u
2			count	25	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15ab	15cd							
3	Motion tests (Ch 8-9)				9.1	9.5	9.5	9.1	9.2	9.5	9.3	8.2	8.3	8.2	9.2	8.4	9.3	8.4	9.1	9.4							
4				% A or Average	0	0	20	76	0	8	12	80	8	72	8	44	5	3	2	1	#####	#####	#####	#####	0	0	0
5				% B or Lower Quartile	0	4	60	8	100	0	52	4	48	28	12	20	4	2	1	0	#####	#####	#####	#####	0	0	0
6				% C or Median	0	80	16	4	0	4	4	16	12	0	76	24	5	4	2	1	#####	#####	#####	#####	0	0	0
7				% D or Upper Quartile	100	8	4	12	0	88	32	0	32	0	4	8	5	4	2	2	#####	#####	#####	#####	0	0	0
8				% E	0	0	0	0	0	0	0	0	0	0	0	0									0	0	0
9	Teacher	Class	ID Code	Name	D	C	B	A	B	D	B	A	B	A	C	A	6	4	2	3	0	0	0	0	sigfigs	d	u
10	ROL	10SPH02	STU0001	Student 1	D	C	B	A	B	D	B	A	B	A	C	A	5	4	2	0						-1	0
11	ROL	10SPH02	STU0002	Student 2	D	C	B	B	B	D	B	A	B	B	D	C	5	4	1	0						0	0
12	ROL	10SPH02	STU0003	Student 3	D	C	C	C	B	D	B	C	C	A	C	0	5	1	1	0						-1	-1
13	ROL	10SPH02	STU0004	Student 4	D	C	B	A	B	D	B	A	B	A	C	C	6	4	2	3						-1	0

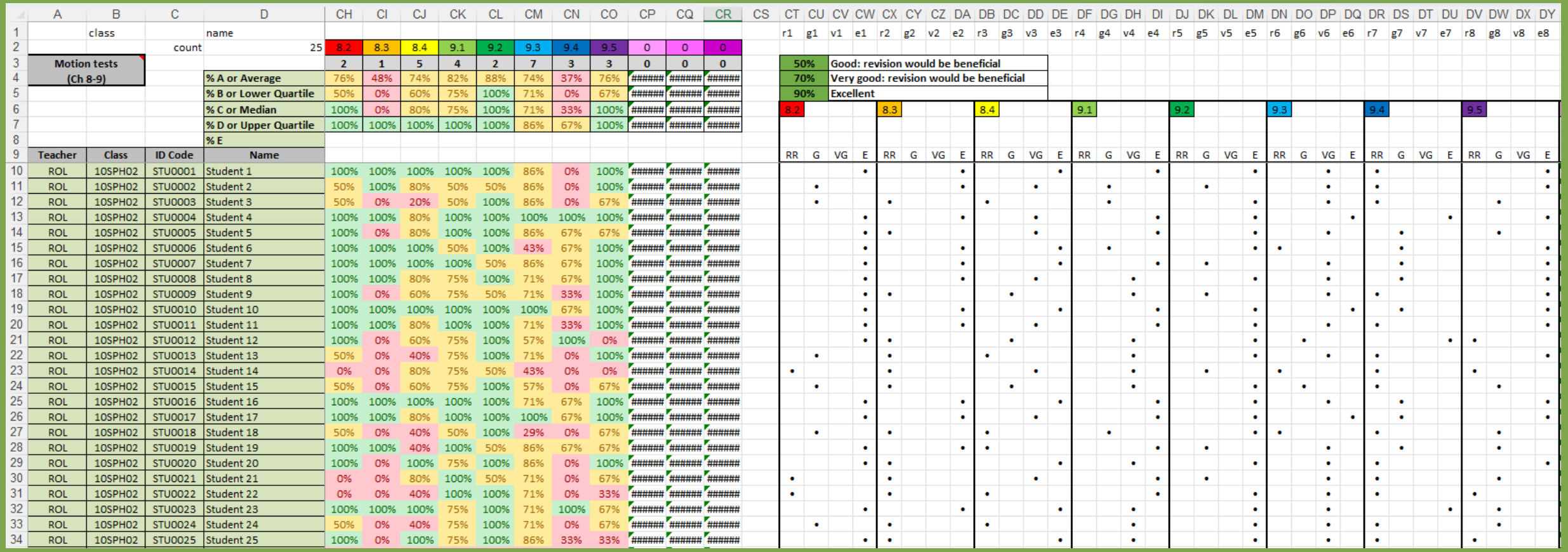
The process in Excel

- Rows 4-8 will either show the % of responses A-E for multiple choice questions or the average and quartiles for short answer questions

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	AS	AT	AU
1		class		name	m1	m2	m3	m4	m5	m6	m7	m8	m9	m10	m11	m12	m13	m14	m15	m16	m17	m18	m19	m20	sigfigs	d	u
2			count	25	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15ab	15cd							
3	Motion tests (Ch 8-9)				9.1	9.5	9.5	9.1	9.2	9.5	9.3	8.2	8.3	8.2	9.2	8.4	9.3	8.4	9.1	9.4							
4				% A or Average	0	0	20	76	0	8	12	80	8	72	8	44	5	3	2	1	#####	#####	#####	#####	0	0	0
5				% B or Lower Quartile	0	4	60	8	100	0	52	4	48	28	12	20	4	2	1	0	#####	#####	#####	#####	0	0	0
6				% C or Median	0	80	16	4	0	4	4	16	12	0	76	24	5	4	2	1	#####	#####	#####	#####	0	0	0
7				% D or Upper Quartile	100	8	4	12	0	88	32	0	32	0	4	8	5	4	2	2	#####	#####	#####	#####	0	0	0
8				% E	0	0	0	0	0	0	0	0	0	0	0	0									0	0	0
9	Teacher	Class	ID Code	Name	D	C	B	A	B	D	B	A	B	A	C	A	6	4	2	3	0	0	0	0	sigfigs	d	u
10	ROL	10SPH02	STU0001	Student 1	D	C	B	A	B	D	B	A	B	A	C	A	5	4	2	0						-1	0
11	ROL	10SPH02	STU0002	Student 2	D	C	B	B	B	D	B	A	B	B	D	C	5	4	1	0						0	0
12	ROL	10SPH02	STU0003	Student 3	D	C	C	C	B	D	B	C	C	A	C	0	5	1	1	0						-1	-1
13	ROL	10SPH02	STU0004	Student 4	D	C	B	A	B	D	B	A	B	A	C	C	6	4	2	3						-1	0
14	ROL	10SPH02	STU0005	Student 5	D	C	A	A	B	D	B	A	D	A	C	D	5	4	2	2						-1	0
15	ROL	10SPH02	STU0006	Student 6	D	C	B	D	B	D	B	A	B	A	C	A	2	4	1	2						0	-1

The process in Excel

- Columns CH onwards show the % achievement-by-topic and the achievement dots
- Adjust the green cells in CT3:CT5 to set the achievement levels as required



	A	B	C	D	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR
1		class		name											
2			count	25	8.2	8.3	8.4	9.1	9.2	9.3	9.4	9.5	0	0	0
3	Motion tests (Ch 8-9)				2	1	5	4	2	7	3	3	0	0	0
4				% A or Average	76%	48%	74%	82%	88%	74%	37%	76%	######	######	######
5				% B or Lower Quartile	50%	0%	60%	75%	100%	71%	0%	67%	######	######	######
6				% C or Median	100%	0%	80%	75%	100%	71%	33%	100%	######	######	######
7				% D or Upper Quartile	100%	100%	100%	100%	100%	86%	67%	100%	######	######	######
8				% E											
9	Teacher	Class	ID Code	Name											
10	ROL	10SPH02	STU0001	Student 1	100%	100%	100%	100%	100%	86%	0%	100%	######	######	######
11	ROL	10SPH02	STU0002	Student 2	50%	100%	80%	50%	50%	86%	0%	100%	######	######	######
12	ROL	10SPH02	STU0003	Student 3	50%	0%	20%	50%	100%	86%	0%	67%	######	######	######
13	ROL	10SPH02	STU0004	Student 4	100%	100%	80%	100%	100%	100%	100%	100%	######	######	######
14	ROL	10SPH02	STU0005	Student 5	100%	0%	80%	100%	100%	86%	67%	67%	######	######	######
15	ROL	10SPH02	STU0006	Student 6	100%	100%	100%	50%	100%	43%	67%	100%	######	######	######
16	ROL	10SPH02	STU0007	Student 7	100%	100%	100%	100%	50%	86%	67%	100%	######	######	######
17	ROL	10SPH02	STU0008	Student 8	100%	100%	80%	75%	100%	71%	67%	100%	######	######	######
18	ROL	10SPH02	STU0009	Student 9	100%	0%	60%	75%	50%	71%	33%	100%	######	######	######
19	ROL	10SPH02	STU0010	Student 10	100%	100%	100%	100%	100%	100%	67%	100%	######	######	######
20	ROL	10SPH02	STU0011	Student 11	100%	100%	80%	100%	100%	71%	33%	100%	######	######	######
21	ROL	10SPH02	STU0012	Student 12	100%	0%	60%	75%	100%	57%	100%	0%	######	######	######
22	ROL	10SPH02	STU0013	Student 13	50%	0%	40%	75%	100%	71%	0%	100%	######	######	######
23	ROL	10SPH02	STU0014	Student 14	0%	0%	80%	75%	50%	43%	0%	0%	######	######	######
24	ROL	10SPH02	STU0015	Student 15	50%	0%	60%	75%	100%	57%	0%	67%	######	######	######
25	ROL	10SPH02	STU0016	Student 16	100%	100%	100%	100%	100%	71%	67%	100%	######	######	######
26	ROL	10SPH02	STU0017	Student 17	100%	100%	80%	100%	100%	100%	67%	100%	######	######	######
27	ROL	10SPH02	STU0018	Student 18	50%	0%	40%	50%	100%	29%	0%	67%	######	######	######
28	ROL	10SPH02	STU0019	Student 19	100%	100%	40%	100%	50%	86%	67%	67%	######	######	######
29	ROL	10SPH02	STU0020	Student 20	100%	0%	100%	75%	100%	86%	0%	100%	######	######	######
30	ROL	10SPH02	STU0021	Student 21	0%	0%	80%	100%	50%	71%	0%	67%	######	######	######
31	ROL	10SPH02	STU0022	Student 22	0%	0%	40%	100%	100%	71%	0%	33%	######	######	######
32	ROL	10SPH02	STU0023	Student 23	100%	100%	100%	75%	100%	71%	100%	67%	######	######	######
33	ROL	10SPH02	STU0024	Student 24	50%	0%	40%	75%	100%	71%	0%	67%	######	######	######
34	ROL	10SPH02	STU0025	Student 25	100%	0%	100%	75%	100%	86%	33%	33%	######	######	######

	50%	Good: revision would be beneficial
	70%	Very good: revision would be beneficial
	90%	Excellent

CS

CT CU CV CW CX CY CZ DA DB DC DD DE DF DG DH DI DJ DK DL DM DN DO DP DQ DR DS DT DU DV DW DX DY

r1 g1 v1 e1 r2 g2 v2 e2 r3 g3 v3 e3 r4 g4 v4 e4 r5 g5 v5 e5 r6 g6 v6 e6 r7 g7 v7 e7 r8 g8 v8 e8

8.2 8.3 8.4 9.1 9.2 9.3 9.4 9.5

RR G VG E RR G VG E RR G VG E RR G VG E RR G VG E RR G VG E RR G VG E RR G VG E

The process in Excel

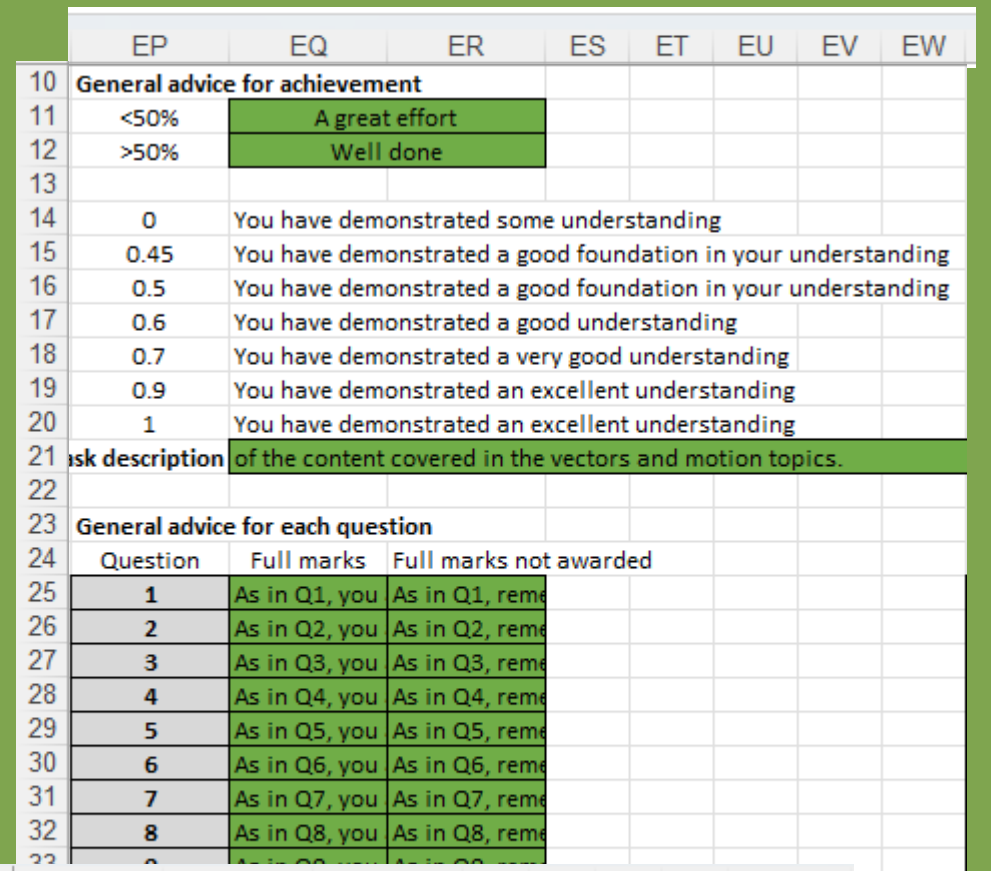
- The Task Summary (from cell FD23) will also display the average % achievement on each subtopic

Task Summary (limit: 11 topics and 40 questions)

Count	uestion	Topic	marks	%	Topic description	Average
2	8,10	8.2	2	7%	Adding vectors in one and two dimensions	76%
1	9	8.3	1	4%	Subtracting vectors in one and two dimensions	48%
2	12,14	8.4	5	19%	Vector components	74%
3	,4,15ab	9.1	4	15%	Displacement, speed and velocity	82%
2	5,11	9.2	2	7%	Acceleration	88%
2	7,13	9.3	7	26%	Graphing position, velocity and acceleration over time	74%
1	15cd	9.4	3	11%	Equations for uniform acceleration	37%
3	2,3,6	9.5	3	11%	Vertical motion	76%
						#DIV/0!
						#DIV/0!
						#DIV/0!
16			27	100%	Task raw average	68%

The process in Excel

- If including comments, the cells from AX10 under heading ‘auto1’ contain formulae for generating an overall achievement comment as per details entered from EQ25
- The cells from AY10 down under heading ‘auto2’ contain formulae for generating advice comments on each question according to marks awarded
- Copy the ‘auto2’ comments and ‘paste as values’ into column AZ for editing
- The ‘aaaaa…’ cells in row 2 are required to mail merge these large text strings

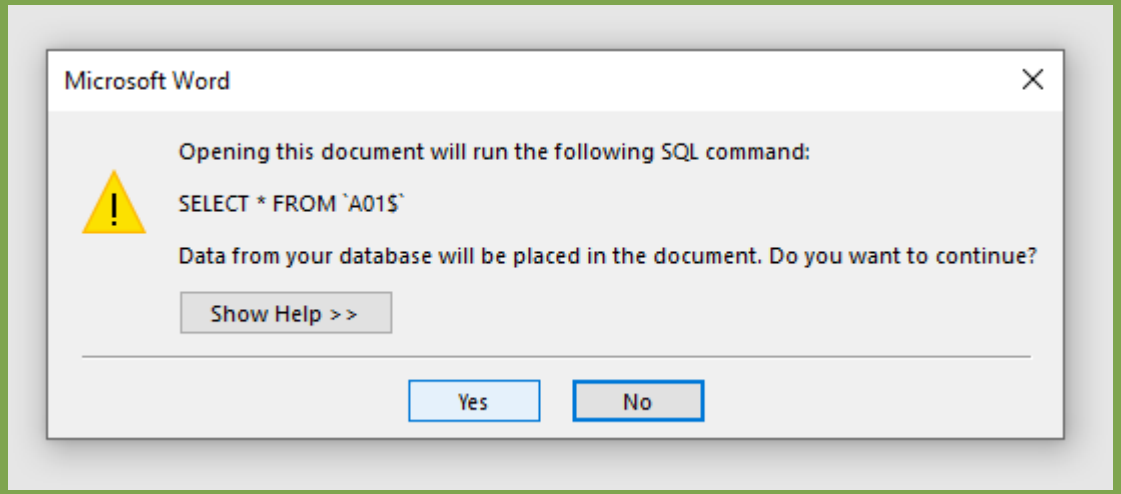


	EP	EQ	ER	ES	ET	EU	EV	EW
10	General advice for achievement							
11	<50%	A great effort						
12	>50%	Well done						
13								
14	0	You have demonstrated some understanding						
15	0.45	You have demonstrated a good foundation in your understanding						
16	0.5	You have demonstrated a good foundation in your understanding						
17	0.6	You have demonstrated a good understanding						
18	0.7	You have demonstrated a very good understanding						
19	0.9	You have demonstrated an excellent understanding						
20	1	You have demonstrated an excellent understanding						
21	sk description	of the content covered in the vectors and motion topics.						
22								
23	General advice for each question							
24	Question	Full marks	Full marks not awarded					
25	1	As in Q1, you	As in Q1, reme					
26	2	As in Q2, you	As in Q2, reme					
27	3	As in Q3, you	As in Q3, reme					
28	4	As in Q4, you	As in Q4, reme					
29	5	As in Q5, you	As in Q5, reme					
30	6	As in Q6, you	As in Q6, reme					
31	7	As in Q7, you	As in Q7, reme					
32	8	As in Q8, you	As in Q8, reme					

	A	B	C	D	AX	AY	AZ	BA	BB	BC	BD	BE
1		class		name	c1		c2	redo	c3	c4		total
2			count	25	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaa	aaaa	aaaa	aaaa	total
3	Motion tests (Ch 8-9)											27
4				% A or Average								18
5				% B or Lower Quartile								15
6				% C or Median								19
7				% D or Upper Quartile								22
8				% E								
9	Teacher	Class	ID Code	Name	auto1	auto2	edit	redo	prep	redo		Score
10	ROL	10SPH02	STU0001	Student 1	Well done	As in Q1, you	As in Q1, you	15cd	I	Pleas		22
11	ROL	10SPH02	STU0002	Student 2	Well done	As in Q1, you	As in Q1, you	15bc	I	Pleas		18
12	ROL	10SPH02	STU0003	Student 3	A great effort	As in Q1, you	As in Q1, you	14,1	I	Pleas		12
13	ROL	10SPH02	STU0004	Student 4	Well done	As in Q1, you	As in Q1, you	none	I	Pleas		25
14	ROL	10SPH02	STU0005	Student 5	Well done	As in Q1, you	As in Q1, you	none	I	Pleas		21
15	ROL	10SPH02	STU0006	Student 6	Well done	As in Q1, you	As in Q1, you	15bd	I	Pleas		19
16	ROL	10SPH02	STU0007	Student 7	Well done	As in Q1, you	As in Q1, you	none	I	Pleas		23

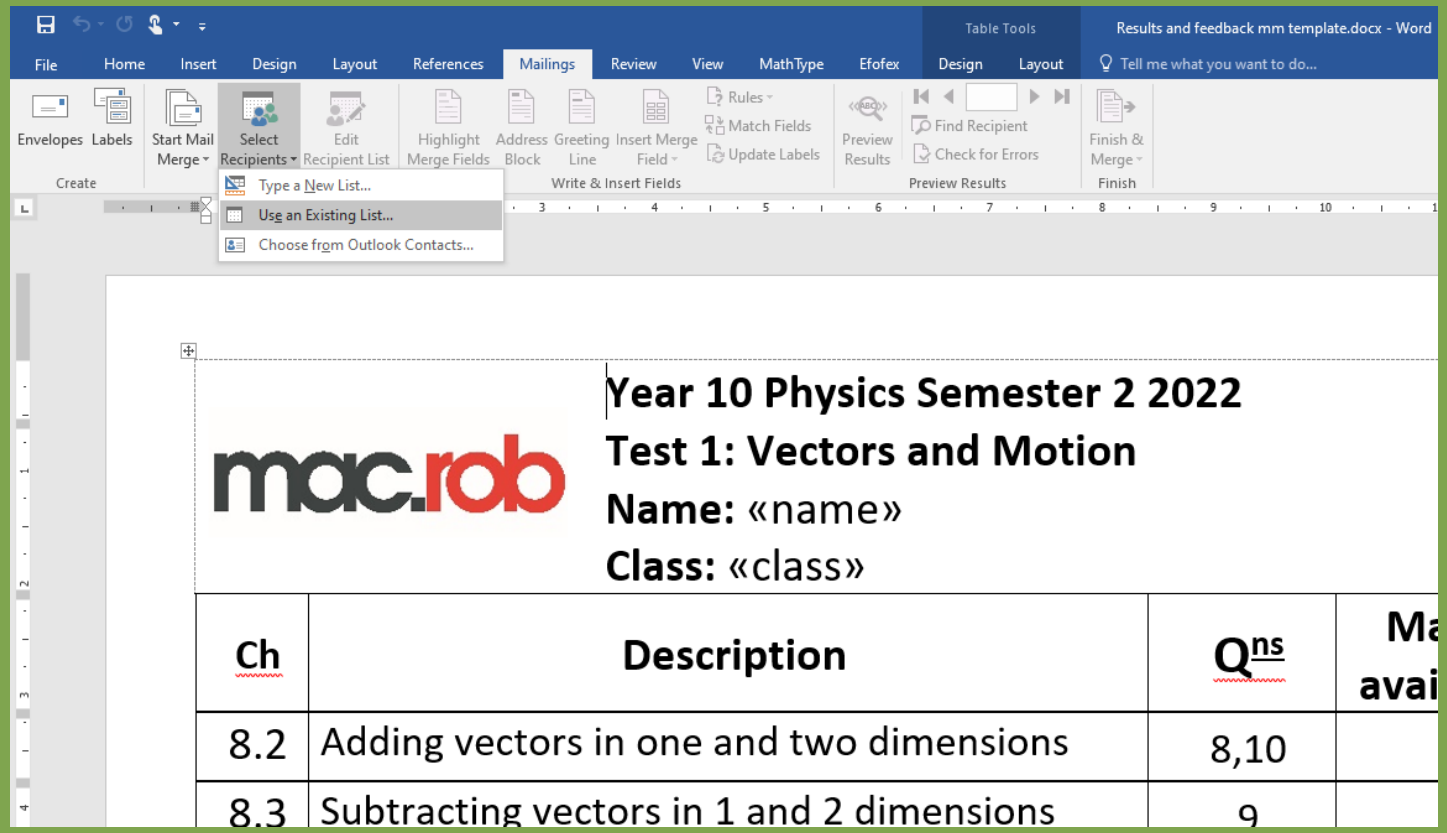
The process in Word

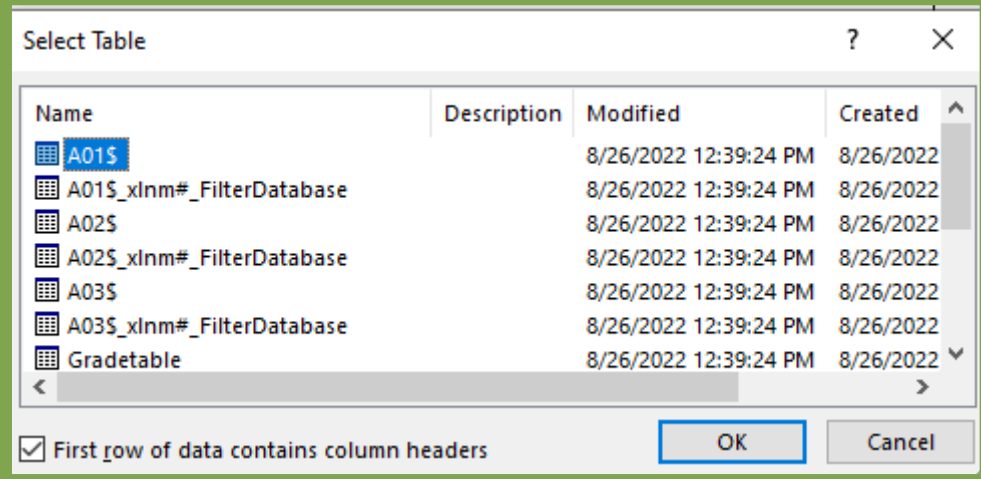
- Download the Word template:
  https://github.com/clairerollinson/auto-feedback-for-students
- Leave the saved Excel file open and then open the saved Word file (otherwise you will be restricted to ‘Read only’ access when you try to re-open the Excel file)
- If Word tries to connect to the Excel file to read the data, select “Yes” from the dialog box if the connection is correct or “No” to connect manually.



The process in Word

- On the Mailings tab, select “Select Recipients” and “Use an Existing List…”
- Navigate to your saved Excel file, select the desired tab (i.e. “A01$”) and press OK
- Be patient; Word may take a minute or two to make the connection





The process in Word

- In the Word file, adjust the task title and details in the columns under the headings ‘Ch’, ‘Description’, ‘Qns’ and ‘Marks available’ by copying from the ‘Task Summary’ in Excel
- Don’t edit any of the cells with codes (i.e. <<name>> etc); these correspond to the headings of the columns in the linked Excel file

Task Summary (limit: 11 topics and 40 questions)

Count	Questions	Topic	marks	%	Topic description
2	8,10	8.2	2	7%	Adding vectors in one and two dimensions
1	9	8.3	1	4%	Subtracting vectors in one and two dimensions
2	12,14	8.4	5	19%	Vector components
3	1,4,15ab	9.1	4	15%	Displacement, speed and velocity
2	5,11	9.2	2	7%	Acceleration
2	7,13	9.3	7	26%	Graphing position, velocity and acceleration over
1	15cd	9.4	3	11%	Equations for uniform acceleration
3	2,3,6	9.5	3	11%	Vertical motion
s	16		27	100%	

mac.rob

Year 10 Physics Semester 2 2022
Test 1: Vectors and Motion
Name: «name»
Class: «class»

Ch	Description	Qns	Marks awarded	Marks available	Achievement: Revision needed	Achievement: Good: revision advised	Achievement: Very Good: revision advised	Achievement: Excellent
8.2	Adding vectors in one and two dimensions	8,10	«s1»	2	«r1»	«g1»	«v1»	«e1»
8.3	Subtracting vectors in 1 and 2 dimensions	9	«s2»	1	«r2»	«g2»	«v2»	«e2»
8.4	Vector components	12,14	«s3»	5	«r3»	«g3»	«v3»	«e3»
9.1	Displacement, speed and velocity	1,4,15ab	«s4»	4	«r4»	«g4»	«v4»	«e4»

The process in Word

- Delete/amend anything as required (i.e. unwanted topic rows, deduction rows, feedback, signature, teacher name, re-do questions etc)
- <<c1>> is the achievement comment
- <<c2>> will output any advice you entered for each question as dot points
- <<c3>> and <<c4>> are optional general advice and redo Q comments (amend on 'Grading' tab in Excel file)
- Adjust general formatting or wait until reports are generated later

mac.rob

Year 10 Physics Semester 2 2022
Test 1: Vectors and Motion
Name: «name»
Class: «class»

Ch	Description	Qns	Marks awarded	Marks available	Achievement: Revision needed	Achievement: Good: revision advised	Achievement: Very Good: revision advised	Achievement: Excellent
8.2	Adding vectors in one and two dimensions	8,10	«s1»	2	«r1»	«g1»	«v1»	«e1»
8.3	Subtracting vectors in 1 and 2 dimensions	9	«s2»	1	«r2»	«g2»	«v2»	«e2»
8.4	Vector components	12,14	«s3»	5	«r3»	«g3»	«v3»	«e3»
9.1	Displacement, speed and velocity	1,4,15ab	«s4»	4	«r4»	«g4»	«v4»	«e4»
9.2	Acceleration	5,11	«s5»	2	«r5»	«g5»	«v5»	«e5»
9.3	Graphing position, velocity & accn over time	7,13	«s6»	7	«r6»	«g6»	«v6»	«e6»
9.4	Equations for uniform acceleration	15cd	«s7»	3	«r7»	«g7»	«v7»	«e7»
9.5	Vertical motion	2,3,6	«s8»	3	«r8»	«g8»	«v8»	«e8»
			«s9»		«r9»	«g9»	«v9»	«e9»
			«s10»		«r10»	«g10»	«v10»	«e10»
			«s11»		«r11»	«g11»	«v11»	«e11»
	Deduction for incorrect significant figures		«sigfigs»					
	Deduction for incorrect direction		«d»					
	Deduction for incorrect units		«u»					
	Total marks awarded (out of «task_tot»)		«total»					
	Scaled grade		«grade»					

Feedback:

«c1»

- «c2»

«c3»

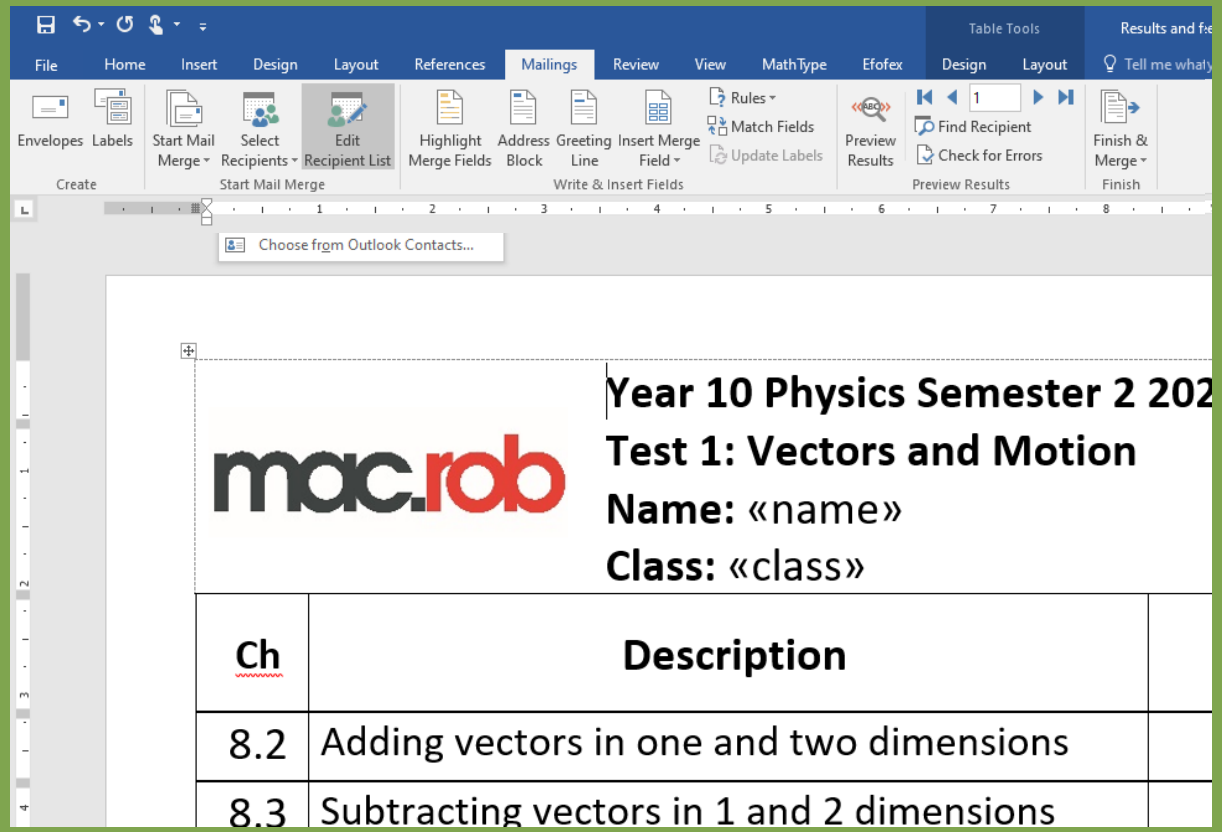
«c4»

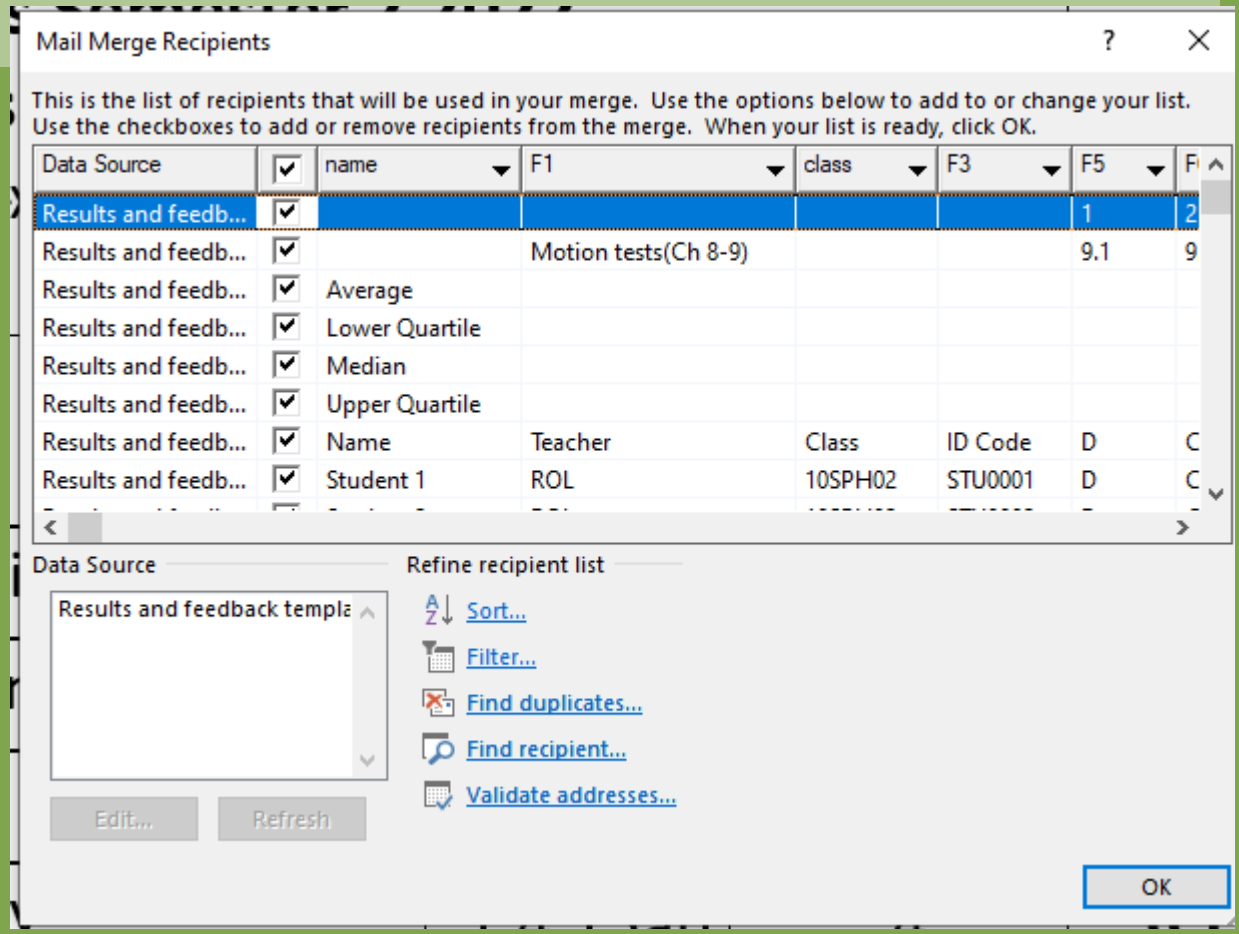
(Ms) C Rollinson

Re-do question/s: «redo»

The process in Word

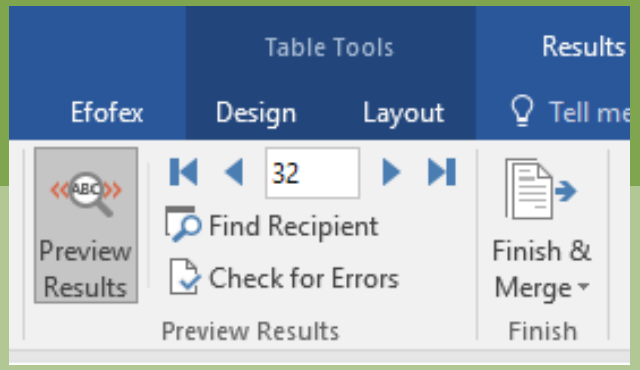
- On the Mailings tab, select “Edit Recipients” and untick the top tick box to deselect all
- Scroll down and select required students in the “name” column
- Click OK

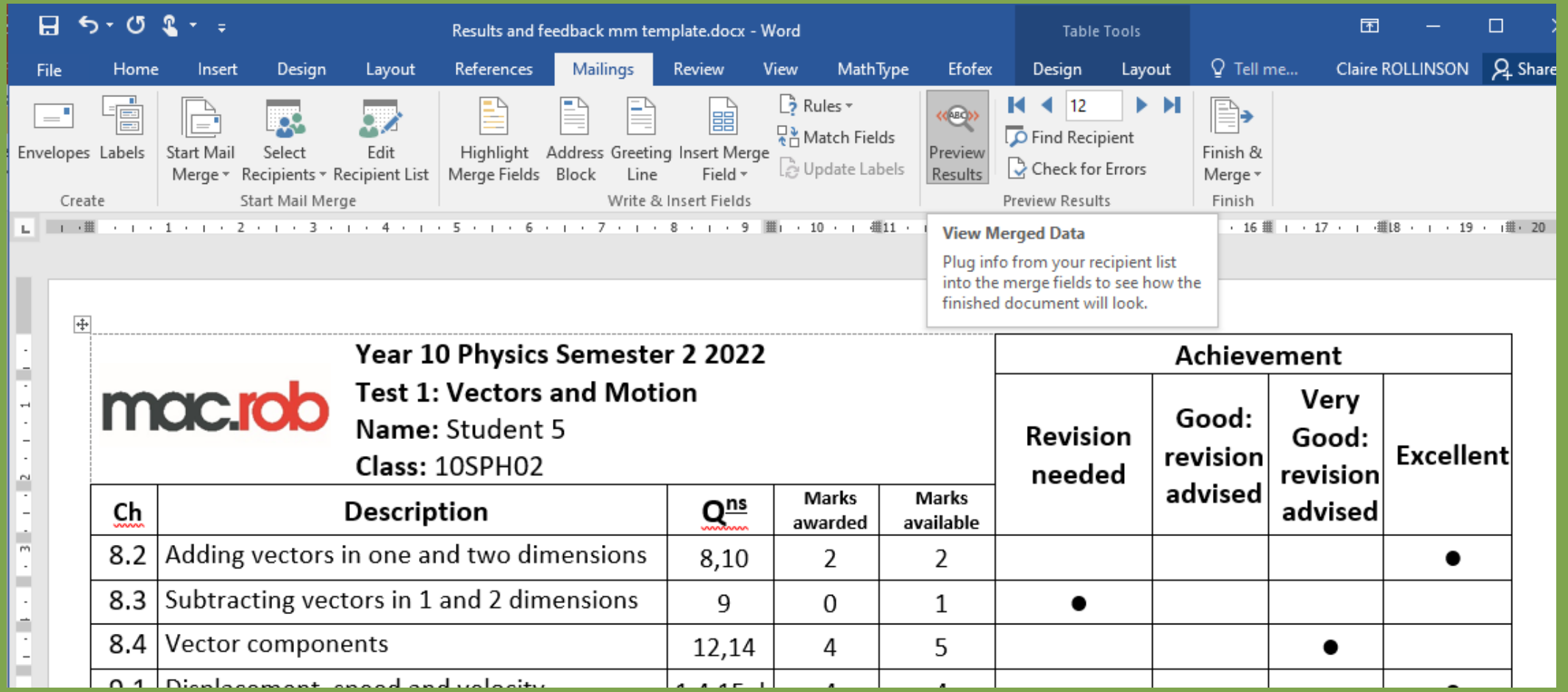




The process in Word

- On the Mailings tab, select “Preview Results” and use the controls to view each student’s report



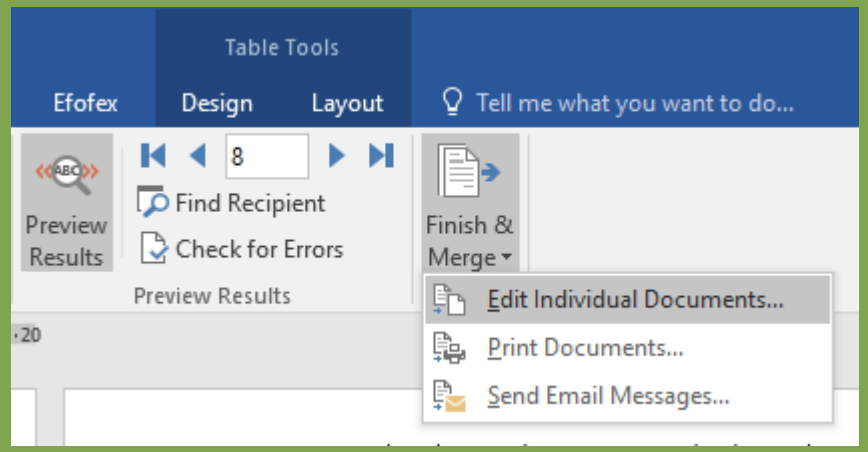


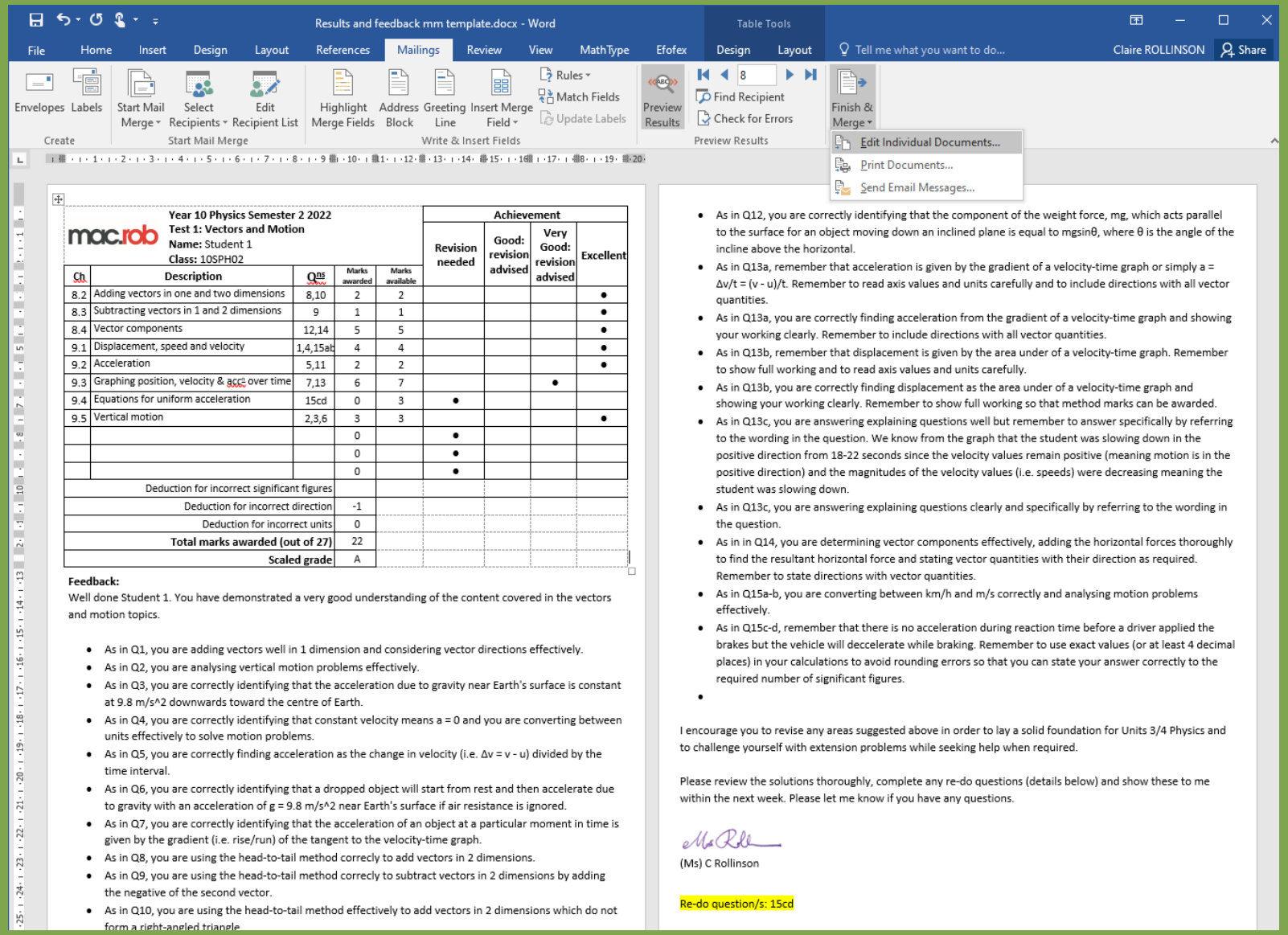
Year 10 Physics Semester 2 2022
Test 1: Vectors and Motion
Name: Student 5
Class: 10SPH02

Ch	Description	Qns	Marks awarded	Marks available	Achievement: Revision needed	Achievement: Good: revision advised	Achievement: Very Good: revision advised	Achievement: Excellent
8.2	Adding vectors in one and two dimensions	8,10	2	2				●
8.3	Subtracting vectors in 1 and 2 dimensions	9	0	1	●			
8.4	Vector components	12,14	4	5			●	
9.1	Displacement, speed and velocity	1,4,15	4	4				●

The process in Word

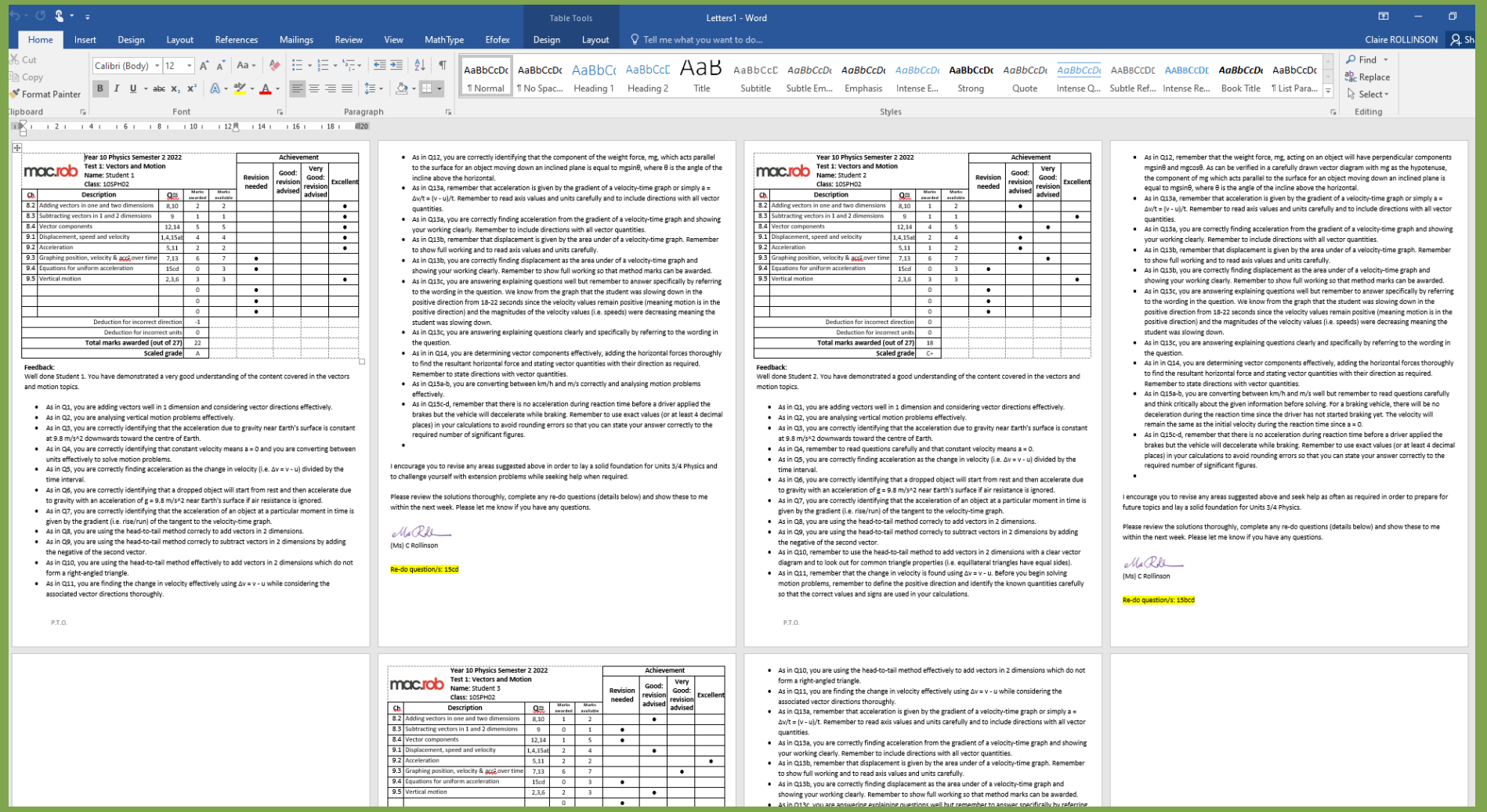
- Review each report; if you notice any errors go back and amend in the Excel file
- Once ready to generate the printable reports, select “Finish & Merge” then “Edit Individual Documents”





The process in Word

- A Word file called “Letters1” will be generated containing all reports
- Format as required for printing
- You may need to delete or insert blank pages to separate the reports



Year 10 Physics Semester 2 2022
Test 1: Vectors and Motion
Name: Student 1
Class: 10SPH02

Ch.	Description	Qns	Marks awarded	Marks available	Revision needed	Good: revision advised	Very Good: revision advised	Excellent
8.2	Adding vectors in one and two dimensions	8,10	2	2				●
8.3	Subtracting vectors in 1 and 2 dimensions	9	1	1				●
8.4	Vector components	12,14	5	5				●
9.1	Displacement, speed and velocity	1,4,15ab	4	4				●
9.2	Acceleration	5,11	2	2				●
9.3	Graphing position, velocity & acc over time	7,13	6	7	●			
9.4	Equations for uniform acceleration	15cd	0	3	●			
9.5	Vertical motion	2,3,6	3	3				●
			0		●			
			0		●			
			0		●			
	Deduction for incorrect direction		-1					
	Deduction for incorrect units		0					
	Total marks awarded (out of 27)		22					
	Scaled grade		A					

Feedback:
Well done Student 1. You have demonstrated a very good understanding of the content covered in the vectors and motion topics.

- As in Q1, you are adding vectors well in 1 dimension and considering vector directions effectively.
- As in Q2, you are analysing vertical motion problems effectively.
- As in Q3, you are correctly identifying that the acceleration due to gravity near Earth's surface is constant at 9.8 m/s^2 downwards toward the centre of Earth.
- As in Q4, you are correctly identifying that constant velocity means a = 0 and you are converting between units effectively to solve motion problems.
- As in Q5, you are correctly finding acceleration as the change in velocity (i.e. Δv = v - u) divided by the time interval.
- As in Q6, you are correctly identifying that a dropped object will start from rest and then accelerate due to gravity with an acceleration of g = 9.8 m/s^2 near Earth's surface if air resistance is ignored.
- As in Q7, you are correctly identifying that the acceleration of an object at a particular moment in time is given by the gradient (i.e. rise/run) of the tangent to the velocity-time graph.
- As in Q8, you are using the head-to-tail method correctly to add vectors in 2 dimensions.
- As in Q9, you are using the head-to-tail method correctly to subtract vectors in 2 dimensions by adding the negative of the second vector.
- As in Q10, you are using the head-to-tail method effectively to add vectors in 2 dimensions which do not form a right-angled triangle.
- As in Q11, you are finding the change in velocity effectively using Δv = v - u while considering the associated vector directions thoroughly.

P.T.O.

- As in Q12, you are correctly identifying that the component of the weight force, mg, which acts parallel to the surface for an object moving down an inclined plane is equal to mgsinθ, where θ is the angle of the incline above the horizontal.
- As in Q13a, remember that acceleration is given by the gradient of a velocity-time graph or simply a = Δv/t = (v - u)/t. Remember to read axis values and units carefully and to include directions with all vector quantities.
- As in Q13a, you are correctly finding acceleration from the gradient of a velocity-time graph and showing your working clearly. Remember to include directions with all vector quantities.
- As in Q13b, remember that displacement is given by the area under of a velocity-time graph. Remember to show full working and to read axis values and units carefully.
- As in Q13b, you are correctly finding displacement as the area under of a velocity-time graph and showing your working clearly. Remember to show full working so that method marks can be awarded.
- As in Q13c, you are answering explaining questions well but remember to answer specifically by referring to the wording in the question. We know from the graph that the student was slowing down in the positive direction from 18-22 seconds since the velocity values remain positive (meaning motion is in the positive direction) and the magnitudes of the velocity values (i.e. speeds) were decreasing meaning the student was slowing down.
- As in Q13c, you are answering explaining questions clearly and specifically by referring to the wording in the question.
- As in in Q14, you are determining vector components effectively, adding the horizontal forces thoroughly to find the resultant horizontal force and stating vector quantities with their direction as required. Remember to state directions with vector quantities.
- As in Q15a-b, you are converting between km/h and m/s correctly and analysing motion problems effectively.
- As in Q15c-d, remember that there is no acceleration during reaction time before a driver applied the brakes but the vehicle will deccelerate while braking. Remember to use exact values (or at least 4 decimal places) in your calculations to avoid rounding errors so that you can state your answer correctly to the required number of significant figures.
-

I encourage you to revise any areas suggested above in order to lay a solid foundation for Units 3/4 Physics and to challenge yourself with extension problems while seeking help when required.

Please review the solutions thoroughly, complete any re-do questions (details below) and show these to me within the next week. Please let me know if you have any questions.

(Ms) C Rollinson

Re-do question/s: 15cd

Year 10 Physics Semester 2 2022
Test 1: Vectors and Motion
Name: Student 2
Class: 10SPH02

Ch.	Description	Qns	Marks awarded	Marks available	Revision needed	Good: revision advised	Very Good: revision advised	Excellent
8.2	Adding vectors in one and two dimensions	8,10	1	2		●		
8.3	Subtracting vectors in 1 and 2 dimensions	9	1	1				●
8.4	Vector components	12,14	4	5			●	
9.1	Displacement, speed and velocity	1,4,15ab	2	4		●		
9.2	Acceleration	5,11	1	2		●		
9.3	Graphing position, velocity & acc over time	7,13	6	7			●	
9.4	Equations for uniform acceleration	15cd	0	3	●			
9.5	Vertical motion	2,3,6	3	3				●
			0		●			
			0		●			
			0		●			
	Deduction for incorrect direction		0					
	Deduction for incorrect units		0					
	Total marks awarded (out of 27)		18					
	Scaled grade		C+					

Feedback:
Well done Student 2. You have demonstrated a good understanding of the content covered in the vectors and motion topics.

- As in Q1, you are adding vectors well in 1 dimension and considering vector directions effectively.
- As in Q2, you are analysing vertical motion problems effectively.
- As in Q3, you are correctly identifying that the acceleration due to gravity near Earth's surface is constant at 9.8 m/s^2 downwards toward the centre of Earth.
- As in Q4, remember to read questions carefully and that constant velocity means a = 0.
- As in Q5, you are correctly finding acceleration as the change in velocity (i.e. Δv = v - u) divided by the time interval.
- As in Q6, you are correctly identifying that a dropped object will start from rest and then accelerate due to gravity with an acceleration of g = 9.8 m/s^2 near Earth's surface if air resistance is ignored.
- As in Q7, you are correctly identifying that the acceleration of an object at a particular moment in time is given by the gradient (i.e. rise/run) of the tangent to the velocity-time graph.
- As in Q8, you are using the head-to-tail method correctly to add vectors in 2 dimensions.
- As in Q9, you are using the head-to-tail method correctly to subtract vectors in 2 dimensions by adding the negative of the second vector.
- As in Q10, remember to use the head-to-tail method to add vectors in 2 dimensions with a clear vector diagram and to look out for common triangle properties (i.e. equilateral triangles have equal sides).
- As in Q11, remember that the change in velocity is found using Δv = v - u. Before you begin solving motion problems, remember to define the positive direction and identify the known quantities carefully so that the correct values and signs are used in your calculations.

P.T.O.

- As in Q12, remember that the weight force, mg, acting on an object will have perpendicular components mgsinθ and mgcosθ. As can be verified in a carefully drawn vector diagram with mg as the hypotenuse, the component of mg which acts parallel to the surface for an object moving down an inclined plane is equal to mgsinθ, where θ is the angle of the incline above the horizontal.
- As in Q13a, remember that acceleration is given by the gradient of a velocity-time graph or simply a = Δv/t = (v - u)/t. Remember to read axis values and units carefully and to include directions with all vector quantities.
- As in Q13a, you are correctly finding acceleration from the gradient of a velocity-time graph and showing your working clearly. Remember to include directions with all vector quantities.
- As in Q13b, remember that displacement is given by the area under of a velocity-time graph. Remember to show full working and to read axis values and units carefully.
- As in Q13b, you are correctly finding displacement as the area under of a velocity-time graph and showing your working clearly. Remember to show full working so that method marks can be awarded.
- As in Q13c, you are answering explaining questions well but remember to answer specifically by referring to the wording in the question. We know from the graph that the student was slowing down in the positive direction from 18-22 seconds since the velocity values remain positive (meaning motion is in the positive direction) and the magnitudes of the velocity values (i.e. speeds) were decreasing meaning the student was slowing down.
- As in Q13c, you are answering explaining questions clearly and specifically by referring to the wording in the question.
- As in in Q14, you are determining vector components effectively, adding the horizontal forces thoroughly to find the resultant horizontal force and stating vector quantities with their direction as required. Remember to state directions with vector quantities.
- As in Q15a-b, you are converting between km/h and m/s well but remember to read questions carefully and think critically about the given information before solving. For a braking vehicle, there will be no deceleration during the reaction time since the driver has not started braking yet. The velocity will remain the same as the initial velocity during the reaction time since a = 0.
- As in Q15c-d, remember that there is no acceleration during reaction time before a driver applied the brakes but the vehicle will deccelerate while braking. Remember to use exact values (or at least 4 decimal places) in your calculations to avoid rounding errors so that you can state your answer correctly to the required number of significant figures.
-

I encourage you to revise any areas suggested above and seek help as often as required in order to prepare for future topics and lay a solid foundation for Units 3/4 Physics.

Please review the solutions thoroughly, complete any re-do questions (details below) and show these to me within the next week. Please let me know if you have any questions.

(Ms) C Rollinson

Re-do question/s: 15bcd

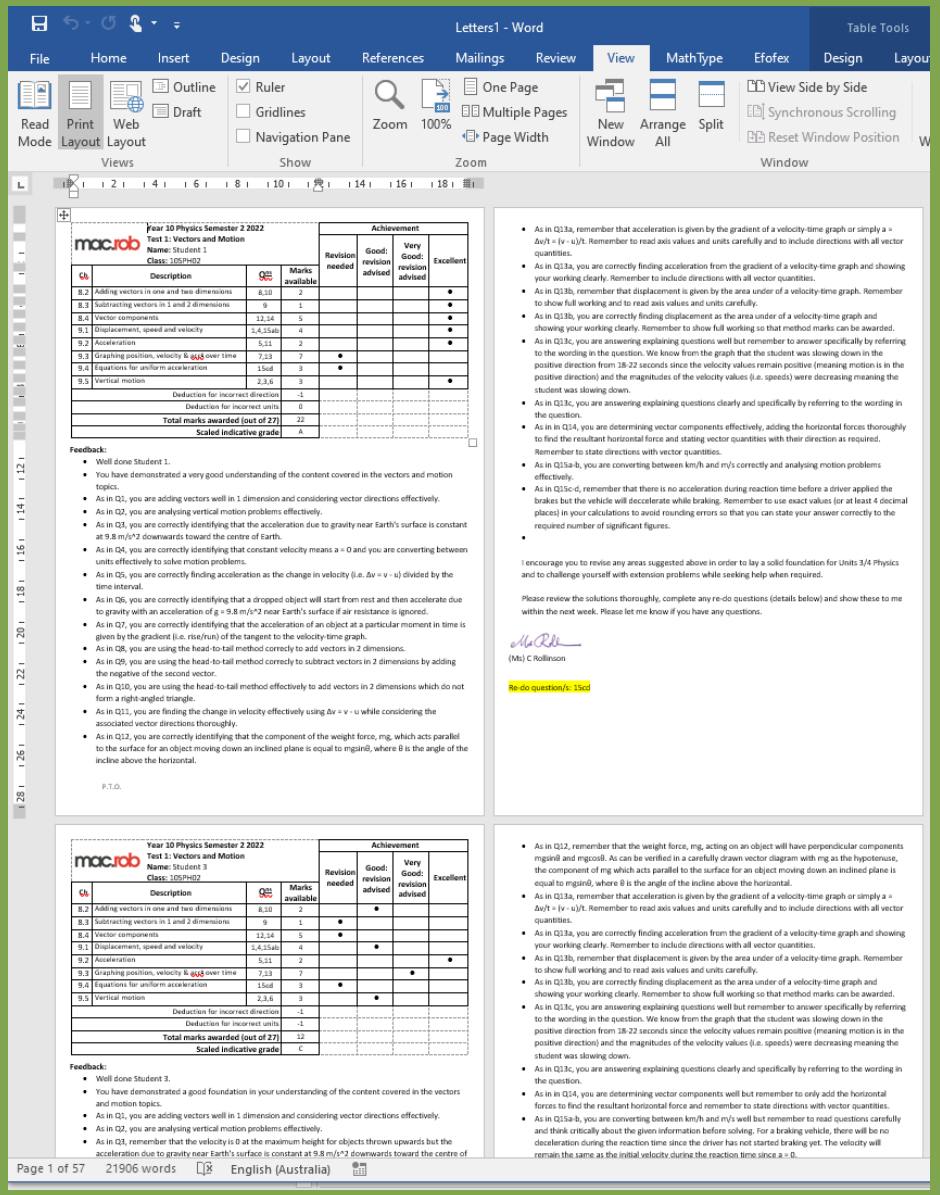
Year 10 Physics Semester 2 2022
Test 1: Vectors and Motion
Name: Student 3
Class: 10SPH02

Ch.	Description	Qns	Marks awarded	Marks available	Revision needed	Good: revision advised	Very Good: revision advised	Excellent
8.2	Adding vectors in one and two dimensions	8,10	1	2		●		
8.3	Subtracting vectors in 1 and 2 dimensions	9	0	1	●			
8.4	Vector components	12,14	1	5	●			
9.1	Displacement, speed and velocity	1,4,15ab	2	4		●		
9.2	Acceleration	5,11	2	2				●
9.3	Graphing position, velocity & acc over time	7,13	6	7			●	
9.4	Equations for uniform acceleration	15cd	0	3	●			
9.5	Vertical motion	2,3,6	2	3		●		
			0		●			

- As in Q10, you are using the head-to-tail method effectively to add vectors in 2 dimensions which do not form a right-angled triangle.
- As in Q11, you are finding the change in velocity effectively using Δv = v - u while considering the associated vector directions thoroughly.
- As in Q13a, remember that acceleration is given by the gradient of a velocity-time graph or simply a = Δv/t = (v - u)/t. Remember to read axis values and units carefully and to include directions with all vector quantities.
- As in Q13a, you are correctly finding acceleration from the gradient of a velocity-time graph and showing your working clearly. Remember to include directions with all vector quantities.
- As in Q13b, remember that displacement is given by the area under of a velocity-time graph. Remember to show full working and to read axis values and units carefully.
- As in Q13b, you are correctly finding displacement as the area under of a velocity-time graph and showing your working clearly. Remember to show full working so that method marks can be awarded.
- As in Q13c, you are answering explaining questions well but remember to answer specifically by referring

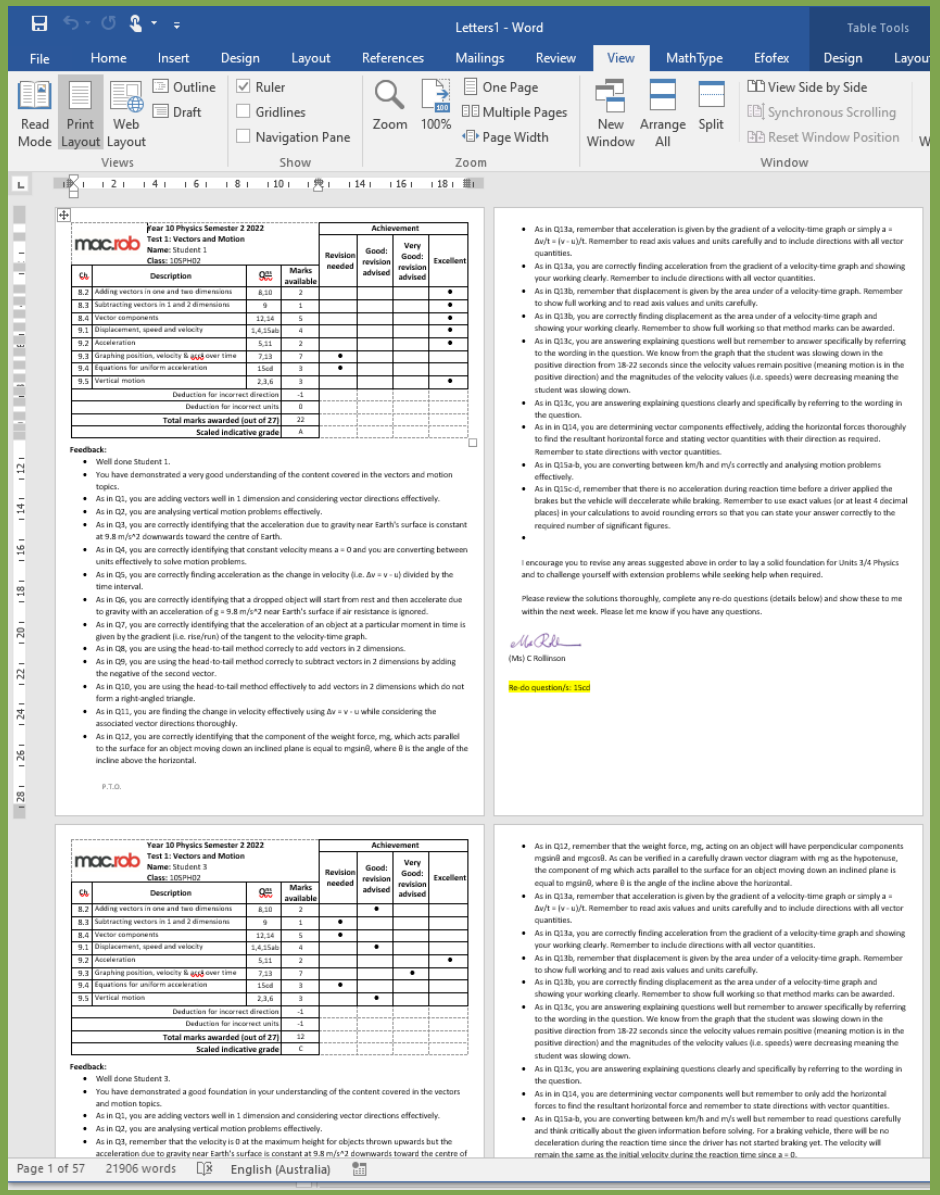
Troubleshooting with Excel and Word

- Seeing ‘Read-only access’ message when trying to open Excel: save and close Word and Excel then re-open Excel file first, followed by Word file.
- If the achievement dots are appearing as zeros, save and close Word and Excel. Open the Excel file first and then the Word file to reconnect.
- The extra bullet point in the comments can be removed by deleting the last blank line in the “edit” cell for each student in column AY.
- Use Alt+Enter to insert a blank line in a cell.
- If any comments are clipped, check that the “aaaa….” cells are in row 2 as in the template.
- Anything else, email rol@macrob.vic.edu.au!



Troubleshooting with shared spread sheets

- Word cannot connect to Google Sheets for the mail merge
  - ✓To use a Google Sheets file, select File > Download > Microsoft Excel (.xlsx) to download and save a copy to your hard drive
  - ✓Connect to the saved file from Word as described from slide 11 onwards
- The template works well in Excel online as a shared file but multiple users cannot edit simultaneously
- Word's mail merge works well with shared Excel files but only via Google Drive for desktop
- Anything else, email rol@macrob.vic.edu.au!



Acknowledgements

- Thank you to all current and previous staff in the Maths and Science faculties at The Mac.Robertson Girls' High School who have contributed to the development of the results spreadsheets on which the Excel template is based
- Thank you to all of my colleagues for their valued support!

mac.rob

Year 10 Physics Semester 2 2022
Test 1: Vectors and Motion
Name: Student 2
Class: 10SPH02

Ch	Description	Q^ns	Marks awarded	Marks available	Achievement: Revision needed	Achievement: Good: revision advised	Achievement: Very Good: revision advised	Achievement: Excellent
8.2	Adding vectors in one and two dimensions	8,10	1	2		●		
8.3	Subtracting vectors in 1 and 2 dimensions	9	1	1				●
8.4	Vector components	12,14	4	5			●	
9.1	Displacement, speed and velocity	1,4,15ab	2	4		●		
9.2	Acceleration	5,11	1	2		●		
9.3	Graphing position, velocity & acc^n over time	7,13	6	7			●	
9.4	Equations for uniform acceleration	15cd	0	3	●			
9.5	Vertical motion	2,3,6	3	3				●
	Deduction for incorrect direction		0					
	Deduction for incorrect units		0					
	Total marks awarded (out of 27)		18					
	Scaled grade		C+					

Feedback:
Well done Student 2. You have demonstrated a good understanding of the content covered in the vectors and motion topics.

- As in Q1, you are adding vectors well in 1 dimension and considering vector directions effectively.
- As in Q2, you are analysing vertical motion problems effectively.
- As in Q3, you are correctly identifying that the acceleration due to gravity near Earth's surface is constant at 9.8 m/s^2 downwards toward the centre of Earth.
- As in Q4, remember to read questions carefully and that constant velocity means a = 0.
- As in Q5, you are correctly finding acceleration as the change in velocity (i.e. Δv = v - u) divided by the time interval.
- As in Q6, you are correctly identifying that a dropped object will start from rest and then accelerate due to gravity with an acceleration of g = 9.8 m/s^2 near Earth's surface if air resistance is ignored.
- As in Q7, you are correctly identifying that the acceleration of an object at a particular moment in time is given by the gradient (i.e. rise/run) of the tangent to the velocity-time graph.