Analysis of question styles used to test students' abilities in their Science GCSEs in June 2018

Executive Summary

- A significant majority of the marks are given for 'recall and apply' questions that test students' ability to recall information from the specification and apply it to different situations.
    - This is particularly true for the Higher papers where 'recall and apply' questions make up between 61% (Biology) and 76% (Chemistry) of the marks.
- More than half of the marks in the Higher level papers in all subjects come from complex 'recall and apply' or 'calculation' questions (i.e. sub-questions offering 3 or more marks).
- Calculation-style questions are the next most important category for Physics Foundation and all the Higher level papers.
- Multiple choice questions make up around 30% of the marks for the Chemistry and Biology Foundation papers, but less than 20% for Physics Foundation and less than 10% for all of the Higher papers.
- Between 1 and 4.5% of the marks are available for plotting data / lines of best fit on graphs / charts.

Summary data

	Biology		Chemistry		Physics	
Question style segment	Foundation	Higher	Foundation	Higher	Foundation	Higher
Traditional multiple choice	15.0%	3.0%	12.5%	4.0%	9.5%	3.0%
Other multiple choice	14.5%	5.5%	20.0%	1.0%	8.5%	2.0%
Simple calculation (1 to 2 marks)	8.0%	6.0%	14.5%	5.0%	19.0%	3.5%
Complex calculation (3+ marks)	1.5%	20.5%	1.5%	11.5%	13.0%	26.0%
Simple recall & apply (1 to 2 marks)	41.5%	26.5%	25.5%	36.5%	31.0%	34.5%
Complex recall & apply (3+ marks)	17.5%	34.5%	21.5%	39.5%	18.0%	28.0%
Plot data on a graph	2.0%	4.0%	4.5%	2.5%	1.0%	3.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

	Biology		Chemistry		Physics	
Question style segment	Foundation	Higher	Foundation	Higher	Foundation	Higher
All multiple choice	29.5%	8.5%	32.5%	5.0%	18.0%	5.0%
All calculations	9.5%	26.5%	16.0%	16.5%	32.0%	29.5%
All ‘recall & apply’	59.0%	61.0%	47.0%	76.0%	49.0%	62.5%
Plot data on a graph / chart	2.0%	4.0%	4.5%	2.5%	1.0%	3.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Methodology

1) We identified 16 different question categories that AQA used in their June 2018 papers for Biology, Chemistry and Physics. If you click on the links below, you will be taken to a page that contains an example of that question style:
    a) Standard multiple choice (select 1 answer from from 4).
    b) Multiple choice (select 2 or 3 from 5).
    c) Fill in words from a list provided.
    d) Calculation multiple choice.
    e) Calculation (1-mark).
    f) Calculation (2-mark).
    g) Calculation (3-mark).
    h) Calculation (4-mark).
    i) Calculation (5-mark).
    j) 1-mark recall & apply.
    k) 2-mark recall & apply.
    l) 3-mark recall & apply.
    m) 4-mark recall & apply.
    n) 5-mark recall & apply.
    o) 6-mark recall & apply.
    p) Plot data on a graph or chart.
2) We allocated all of the sub-questions from AQA's Paper 1 & Paper 2 for June 2018 for all of the sciences into one of the categories listed above.
3) We aggregated the data for both Higher papers and for both Foundation papers for each sub-section.
4) We aggregated the 16 categories into 7 segments to make the data easier to understand.
    - Traditional multiple choice - category (a) only above.
    - Other multiple choice - categories (b) to (d) above.
    - Simple calculations - categories (e) and (f) above.
    - Complex calculations - categories (g) to (i) above.
    - Simple recall and apply - categories (j) and (k) above.
    - Complex recall and apply - categories (l) to (o) above.
    - Plot data - category (p).
5) We aggregated the data once more to get total figures for all:
    a) Multiple choice questions.
    b) 'Calculations' questions.
    c) 'Recall and apply' questions.

Base data (Biology Foundation level)

Biology June 2018 AQA Foundation P1	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Total
Standard multiple choice (1 from 4)	6	4	2	1	2	3						18
Multiple choice (2 or 3 from 5)		2		3				2				7
Fill in words from a list		0	5									5
Calculation (1-mark)				1								1
Calculation (2-mark)	2	2		2								6
Calculation (3-mark)								3				3
1-mark recall & apply	1	2	1	1	3	4	7	1				20
2-mark recall & apply				6	6		4	4				20
3-mark recall & apply		0	3			3						6
4-mark recall & apply			4									4
6-mark recall & apply								6				6
Plot data								4				4
Total	9	10	15	14	11	10	11	20	0	0	0	100

Biology June 2018 AQA Foundation P2	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Total
Standard multiple choice (1 from 4)		2		3	2		2	2			1	12
Multiple choice (2 or 3 from 5)	3	3			2			2	2			12
Fill in words from a list	3									2		5
Calculation (1-mark)				2		1						3
Calculation (2-mark)	2					2					2	6
Calculation (3-mark)												0
1-mark recall & apply	1	1	2	1	2	2			3	3		15
2-mark recall & apply			4	2	4	4	6	4		2	2	28
3-mark recall & apply		3	3								3	9
4-mark recall & apply										4		4
6-mark recall & apply									6			6
Plot data												0
Total	9	9	9	8	10	9	8	8	11	11	8	100

Both AQA Biology Foundation Papers 2018	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Total	Average
Standard multiple choice (1 from 4)	6	6	2	4	4	3	2	2	0	0	1	30	15
Multiple choice (2 or 3 from 5)	3	5	0	3	2	0	0	4	2	0		19	9.5
Fill in words from a list	3	0	5	0	0	0	0	0	0	2		10	5
Calculation (1-mark)	0	0	0	3	0	1	0	0	0	0		4	2
Calculation (2-mark)	4	2	0	2	0	2	0	0	0	0	2	12	6
Calculation (3-mark)	0	0	0	0	0	0	0	3	0	0		3	1.5
1-mark recall & apply	2	3	3	2	5	6	7	1	3	3		35	17.5
2-mark recall & apply	0	0	4	8	10	4	10	8	0	2	2	48	24
3-mark recall & apply	0	3	6	0	0	3	0	0	0	0	3	15	7.5
4-mark recall & apply	0	0	4	0	0	0	0	0	0	4		8	4
6-mark recall & apply	0	0	0	0	0	0	0	6	6	0		12	6
Plot data	0	0	0	0	0	0	0	4	0	0		4	2
Total	18	19	24	22	21	19	19	28	11	11	8	200	100

Primary research conducted by GCSE Prepper

Aggregated data (Biology Foundation level)

Both AQA Biology Foundation Papers 2018	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Total	Average
Standard multiple choice (1 from 4)	6	6	2	4	4	3	2	2	0	0	1	**30**	**15**
Multiple choice (2 or 3 from 5)	3	5	0	3	2	0	0	4	2	0		**19**	**9.5**
Fill in words from a list	3	0	5	0	0	0	0	0	0	2		**10**	**5**
Calculation (1-mark)	0	0	0	3	0	1	0	0	0	0		**4**	**2**
Calculation (2-mark)	4	2	0	2	0	2	0	0	0	0	2	**12**	**6**
Calculation (3-mark)	0	0	0	0	0	0	0	3	0	0		**3**	**1.5**
1-mark recall & apply	2	3	3	2	5	6	7	1	3	3		**35**	**17.5**
2-mark recall & apply	0	0	4	8	10	4	10	8	0	2	2	**48**	**24**
3-mark recall & apply	0	3	6	0	0	3	0	0	0	0	3	**15**	**7.5**
4-mark recall & apply	0	0	4	0	0	0	0	0	0	4		**8**	**4**
6-mark recall & apply	0	0	0	0	0	0	0	6	6	0		**12**	**6**
Plot data	0	0	0	0	0	0	0	4	0	0		**4**	**2**
Total	18	19	24	22	21	19	19	28	11	11	8	**200**	**100**

Type of question segment	Biology Foundation
Traditional multiple choice	15.0%
Other multiple choiuce	14.5%
Simple calculation (1 to 2 marks)	8.0%
Complex calculation (3+ marks)	1.5%
Simple recall & apply (1 to 2 marks)	41.5%
Complex recall & apply (3+ marks)	17.5%
Plot data on a graph	2.0%
Total	100.0%

Primary research conducted by GCSE Prepper

Base data (Biology Higher level)

Biology June 2018 AQA Higher P1	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Total
Standard multiple choice (1 from 4)			1									1
Multiple choice (2 or 3 from 5)		2	2									4
Fill in words from a list												0
Calculation (2-mark)		2		2								4
Calculation (3-mark)		3										3
Calculation (5-mark)												0
1-mark recall & apply	7	1	2	1	1	4	1					17
2-mark recall & apply	4	2	2			4						12
3-mark recall & apply			6	9			9					24
4-mark recall & apply					4	4						8
5-mark recall & apply					5							5
6-mark recall & apply		6				6	6					18
Plot data		4										4
Total	11	20	13	12	10	18	16	0	0	0	0	100

Biology June 2018 AQA Higher P2	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Total
Standard multiple choice (1 from 4)			1		2	1		1				5
Multiple choice (2 or 3 from 5)	2					3						5
Fill in words from a list		2										2
Calculation (2-mark)			2									2
Calculation (3-mark)							3					3
Calculation (5-mark)				5								5
1-mark recall & apply	3	3	2	1		3	1	4	2			19
2-mark recall & apply		2		2	2				2			8
3-mark recall & apply			3			3		3				9
4-mark recall & apply		4			4			8				16
5-mark recall & apply							5		5			10
6-mark recall & apply	6			6								12
Plot data							4					4
Total	11	11	8	14	8	10	13	16	9	0	0	100

Both AQA Biology Higher Papers 2018	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Total	Average
Standard multiple choice (1 from 4)	0	0	2	0	2	1	0	1	0	0		6	3
Multiple choice (2 or 3 from 5)	2	2	2	0	0	3	0	0	0	0		9	4.5
Fill in words from a list	0	2	0	0	0	0	0	0	0	0		2	1
Calculation (2-mark)	0	2	2	2	0	0	0	0	0	0		6	3
Calculation (3-mark)	0	3	0	0	0	0	3	0	0	0		6	3
Calculation (5-mark)	0	0	0	5	0	0	0	0	0	0		5	2.5
1-mark recall & apply	10	4	4	2	1	7	2	4	2	0		36	18
2-mark recall & apply	4	4	2	2	2	4	0	0	2	0		20	10
3-mark recall & apply	0	0	9	9	0	3	9	3	0	0		33	16.5
4-mark recall & apply	0	4	0	0	8	4	0	8	0	0		24	12
6-mark recall & apply	0	0	0	0	5	0	5	0	5	0		15	7.5
6-mark recall & apply	6	6	0	6	0	6	6	0	0	0		30	15
Plot data	0	4	0	0	0	0	4	0	0	0		8	4
											0		
Total	22	31	21	26	18	28	29	16	9	0	0	200	100

Primary research conducted by GCSE Prepper

Aggregated data (Biology Higher level)

Both AQA Biology Higher Papers 2018	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Total	Average
Standard multiple choice (1 from 4)	0	0	2	0	2	1	0	1	0	0		6	3
Multiple choice (2 or 3 from 5)	2	2	2	0	0	3	0	0	0	0		9	4.5
Fill in words from a list	0	2	0	0	0	0	0	0	0	0		2	1
Calculation (2-mark)	0	2	2	2	0	0	0	0	0	0		6	3
Calculation (3-mark)	0	3	0	0	0	0	3	0	0	0		6	3
Calculation (5-mark)	0	0	0	5	0	0	0	0	0	0		5	2.5
1-mark recall & apply	10	4	4	2	1	7	2	4	2	0		36	18
2-mark recall & apply	4	4	2	2	2	4	0	0	2	0		20	10
3-mark recall & apply	0	0	9	9	0	3	9	3	0	0		33	16.5
4-mark recall & apply	0	4	0	0	8	4	0	8	0	0		24	12
6-mark recall & apply	0	0	0	0	5	0	5	0	5	0		15	7.5
6-mark recall & apply	6	6	0	6	0	6	6	0	0	0		30	15
Plot data	0	4	0	0	0	0	4	0	0	0		8	4
											0		
Total	22	31	21	26	18	28	29	16	9	0	0	200	100

Question style segment	Biology Higher
Traditional multiple choice	3.0%
Other multiple choiuce	5.5%
Simple calculation (1 to 2 marks)	6.0%
Complex calculation (3+ marks)	20.5%
Simple recall & apply (1 to 2 marks)	26.5%
Complex recall & apply (3+ marks)	34.5%
Plot data on a graph	4.0%
Total	100.0%

Base data (Chemistry Foundation level)

Chemistry June 2018 AQA Foundation P1	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total
Standard multiple choice (1 from 4)	3	2		3		3	3			1	15
Multiple choice (2 or 3 from 5)	5					2					7
Fill in words from a list		0	5	4							9
Calculation multiple choice		1									1
Calculation (1-mark)					1						1
Calculation (2-mark)	2	2	4		2		2				12
Calculation (3-mark)									3		3
1-mark recall & apply	1	1	1	1	4	2	3	2	1	2	18
2-mark recall & apply					2				4	2	8
3-mark recall & apply		3				3			3		9
4-mark recall & apply											0
6-mark recall & apply								6		6	12
Plot data					1	2	2				5
Total	11	9	10	8	10	12	10	8	11	11	100

Chemistry June 2018 AQA Foundation P2	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total
Standard multiple choice (1 from 4)	2	2	4			2					10
Multiple choice (2 or 3 from 5)	2	6			6		4	2			20
Fill in words from a list						3					3
Calculation multiple choice											0
Calculation (1-mark)	1			1							2
Calculation (2-mark)	2		2	2	2		4		2		14
Calculation (3-mark)											0
1-mark recall & apply	1	1				0	2	4	6	3	17
2-mark recall & apply			2	2			2			2	8
3-mark recall & apply				3			3	3	3		12
4-mark recall & apply						4					4
6-mark recall & apply										6	6
Plot data				2			2				4
Total	8	9	8	10	8	9	17	9	11	11	100

Both Chemistry Foundation papers	Total	Average (%)
Standard multiple choice (1 from 4)	25	12.5
Multiple choice (2 or 3 from 5)	27	13.5
Fill in words from a list	12	6
Calculation multiple choice	1	0.5
Calculation (1-mark)	3	1.5
Calculation (2-mark)	26	13
Calculation (3-mark)	3	1.5
1-mark recall & apply	35	17.5
2-mark recall & apply	16	8
3-mark recall & apply	21	10.5
4-mark recall & apply	4	2
6-mark recall & apply	18	9
Plot data	9	4.5
Total	200	100

Primary research conducted by GCSE Prepper

Aggregated data (Chemistry Foundation level)

Both Chemistry Foundation papers	Total	Average (%)
Standard multiple choice (1 from 4)	25	12.5
Multiple choice (2 or 3 from 5)	27	13.5
Fill in words from a list	12	6
Calculation multiple choice	1	0.5
Calculation (1-mark)	3	1.5
Calculation (2-mark)	26	13
Calculation (3-mark)	3	1.5
1-mark recall & apply	35	17.5
2-mark recall & apply	16	8
3-mark recall & apply	21	10.5
4-mark recall & apply	4	2
6-mark recall & apply	18	9
Plot data	9	4.5
Total	200	100

Question style segment	Chemistry Foundation
Traditional multiple choice	12.5%
Other multiple choiuce	20.0%
Simple calculation (1 to 2 marks)	14.5%
Complex calculation (3+ marks)	1.5%
Simple recall & apply (1 to 2 marks)	25.5%
Complex recall & apply (3+ marks)	21.5%
Plot data on a graph	4.5%
Total	100.0%

Base data (Chemistry Higher level)

Chemistry June 2018 AQA Higher P1	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total
Standard multiple choice (1 from 4)			1	4							5
Multiple choice (2 or 3 from 5)											0
1-mark recall & apply	2	1	2	1	1		1	4	1		13
Calculation (2-mark)								2	2		4
Calculation (3-mark)		3				3		0			6
Calculation (4-mark)							4	4			8
Calculation (5-mark)							0	0	5		5
2-mark recall		4	2			5		2	4		17
3-mark recall & apply		3		3	3	6	6	3			24
4-mark recall & apply					4						4
6-mark recall & apply	6		6								12
Plot data				0	2						2
Total	8	11	11	8	10	14	11	15	12	0	100

Chemistry June 2018 AQA Higher P2	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total
Standard multiple choice (1 from 4)							1		2		3
Multiple choice (2 or 3 from 5)	2										2
1-mark recall & apply	4	6	3		0	1	1		2		17
Calculation (2-mark)		2		2					0	2	6
Calculation (3-mark)											0
Calculation (4-mark)								4			4
Calculation (5-mark)											0
2-mark recall			2	2	2	2	10	2	4	2	26
3-mark recall & apply	3	3			0	3					9
4-mark recall & apply				4	0	4			4		12
6-mark recall & apply			6		6				0	6	18
Plot data								3			3
Total	9	11	11	8	8	10	12	9	12	10	100

Both AQA Chemistry Higher Papers 2018	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Average
Standard multiple choice (1 from 4)	0	0	1	4	0	0	1	0	2	0	8	4
Multiple choice (2 or 3 from 5)	2	0	0	0	0	0	0	0	0	0	2	1
1-mark recall & apply	6	7	5	1	1	1	2	4	3	0	30	15
Calculation (2-mark)	0	2	0	2	0	0	0	2	2	2	10	5
Calculation (3-mark)	0	3	0	0	0	3	0	0	0	0	6	3
Calculation (4-mark)	0	0	0	0	0	0	4	8	0	0	12	6
Calculation (5-mark)	0	0	0	0	0	0	0	0	5	0	5	2.5
2-mark recall	0	4	4	2	2	7	10	4	8	2	43	21.5
3-mark recall & apply	3	6	0	3	3	9	6	3	0	0	33	16.5
4-mark recall & apply	0	0	0	4	4	4	0	0	4	0	16	8
6-mark recall & apply	6	0	12	0	6	0	0	0	0	6	30	15
Plot data	0	0	0	0	2	0	0	3	0	0	5	2.5
Total	17	22	22	16	18	24	23	24	24	10	200	100

Primary research conducted by GCSE Prepper

Aggregated data (Chemistry Higher level)

Both AQA Chemistry Higher Papers 2018	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Average
Standard multiple choice (1 from 4)	0	0	1	4	0	0	1	0	2	0	8	4
Multiple choice (2 or 3 from 5)	2	0	0	0	0	0	0	0	0	0	2	1
1-mark recall & apply	6	7	5	1	1	1	2	4	3	0	30	15
Calculation (2-mark)	0	2	0	2	0	0	0	2	2	2	10	5
Calculation (3-mark)	0	3	0	0	0	3	0	0	0	0	6	3
Calculation (4-mark)	0	0	0	0	0	0	4	8	0	0	12	6
Calculation (5-mark)	0	0	0	0	0	0	0	0	5	0	5	2.5
2-mark recall	0	4	4	2	2	7	10	4	8	2	43	21.5
3-mark recall & apply	3	6	0	3	3	9	6	3	0	0	33	16.5
4-mark recall & apply	0	0	0	4	4	4	0	0	4	0	16	8
6-mark recall & apply	6	0	12	0	6	0	0	0	0	6	30	15
Plot data	0	0	0	0	2	0	0	3	0	0	5	2.5
Total	17	22	22	16	18	24	23	24	24	10	200	100

Question style segment	Chemistry Higher
Traditional multiple choice	4.0%
Other multiple choiuce	1.0%
Simple calculation (1 to 2 marks)	5.0%
Complex calculation (3+ marks)	11.5%
Simple recall & apply (1 to 2 marks)	36.5%
Complex recall & apply (3+ marks)	39.5%
Plot data on a graph	2.5%
Total	100.0%

Base data (Physics Foundation level)

Physics June 2018 AQA Foundation P1	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Total
Standard multiple choice (1 from 4)	1	2	1	1			1	1				1	8
Multiple choice (2 or 3 from 5)									2			2	4
Fill in words from a list	2					3							5
Calculation (1-mark)			1										1
Calculation (2-mark)	4	2	2	2		2	4	2	2	2	2		24
Calculation (3-mark)							3		3		3		9
Calculation (4-mark)								4					4
1-mark recall & apply		1	1	2	2		1	1	1	1	1		11
2-mark recall & apply			2		2	4		4	2	2	2		18
3-mark recall & apply										3		3	6
4-mark recall & apply				4									4
6-mark recall & apply												6	6
Plot data													0
Total	7	5	7	9	4	9	9	12	10	8	8	12	100

Physics June 2018 AQA Foundation P2	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Total
Standard multiple choice (1 from 4)	1	1	1	1	1	2		2		1		1	11
Multiple choice (2 or 3 from 5)		2			2								4
Fill in words from a list		1	1		1				1				4
Calculation (1-mark)												1	1
Calculation (2-mark)	4		2			2	2		2				12
Calculation (3-mark)						3	3					3	9
Calculation (4-mark)		4											4
1-mark recall & apply	2			1	3	1	2	1	3	1	2	1	17
2-mark recall & apply			2	4	2			2		2	2	2	16
3-mark recall & apply				6									6
4-mark recall & apply										4	4		8
6-mark recall & apply											6		6
Plot data											2		2
Total	7	8	6	12	9	8	7	5	6	8	16	8	100

Both AQA Physics Foundation Papers 2018	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Total	Average
Standard multiple choice (1 from 4)	2	3	2	2	1	2	1	3	0	1	0	2	19	9.5
Multiple choice (2 or 3 from 5)	0	2	0	0	2	0	0	0	2	0	0	2	8	4
Fill in words from a list	2	1	1	0	1	3	0	0	1	0	0	0	9	4.5
Calculation (1-mark)	0	0	1	0	0	0	0	0	0	0	0	1	2	1
Calculation (2-mark)	8	2	4	2	0	4	6	2	4	2	2	0	36	18
Calculation (3-mark)	0	0	0	0	0	3	6	0	3	0	3	3	18	9
Calculation (4-mark)	0	4	0	0	0	0	0	4	0	0	0	0	8	4
1-mark recall & apply	2	1	1	3	5	1	3	2	4	2	3	1	28	14
2-mark recall & apply	0	0	4	4	4	4	0	6	2	4	4	2	34	17
3-mark recall & apply	0	0	0	6	0	0	0	0	0	3	0	3	12	6
4-mark recall & apply	0	0	0	4	0	0	0	0	0	4	4	0	12	6
6-mark recall & apply	0	0	0	0	0	0	0	0	0	0	6	6	12	6
Plot data	0	0	0	0	0	0	0	0	0	0	2	0	2	1
Total	14	13	13	21	13	17	16	17	16	16	24	20	200	100

Primary research conducted by GCSE Prepper

Aggregated data (Physics Foundation level)

Both AQA Physics Foundation Papers 2018	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Total	Average
Standard multiple choice (1 from 4)	2	3	2	2	1	2	1	3	0	1	0	2	**19**	**9.5**
Multiple choice (2 or 3 from 5)	0	2	0	0	2	0	0	0	2	0	0	2	**8**	**4**
Fill in words from a list	2	1	1	0	1	3	0	0	1	0	0	0	**9**	**4.5**
Calculation (1-mark)	0	0	1	0	0	0	0	0	0	0	0	1	**2**	**1**
Calculation (2-mark)	8	2	4	2	0	4	6	2	4	2	2	0	**36**	**18**
Calculation (3-mark)	0	0	0	0	0	3	6	0	3	0	3	3	**18**	**9**
Calculation (4-mark)	0	4	0	0	0	0	0	4	0	0	0	0	**8**	**4**
1-mark recall & apply	2	1	1	3	5	1	3	2	4	2	3	1	**28**	**14**
2-mark recall & apply	0	0	4	4	4	4	0	6	2	4	4	2	**34**	**17**
3-mark recall & apply	0	0	0	6	0	0	0	0	0	3	0	3	**12**	**6**
4-mark recall & apply	0	0	0	4	0	0	0	0	0	4	4	0	**12**	**6**
6-mark recall & apply	0	0	0	0	0	0	0	0	0	0	6	6	**12**	**6**
Plot data	0	0	0	0	0	0	0	0	0	0	2	0	**2**	**1**
Total	14	13	13	21	13	17	16	17	16	16	24	20	**200**	**100**

Question style segment	Physics Foundation
Traditional multiple choice	9.5%
Other multiple choiuce	8.5%
Simple calculation (1 to 2 marks)	19.0%
Complex calculation (3+ marks)	13.0%
Simple recall & apply (1 to 2 marks)	31.0%
Complex recall & apply (3+ marks)	18.0%
Plot data on a graph	1.0%
Total	100.0%

Primary research conducted by GCSE Prepper

Base data (Physics Higher level)

Physics June 2018 AQA Higher P1	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total
Standard multiple choice (1 from 4)			1								1
Multiple choice (2 or 3 from 5)			2								2
Fill in words from a list					2						2
Calculation (1-mark)											0
Calculation (2-mark)		2		2							4
Calculation (3-mark)		3		3			3		3	6	18
Calculation (4-mark)					4						4
Calculation (5-mark)									5		5
1-mark recall & apply	1	1		1	1	2		1	1		8
2-mark recall & apply	4	2		2	4	4	8				24
3-mark recall & apply	3		3	3	3			3		3	18
4-mark recall & apply						4		4			8
6-mark recall & apply			6								6
Plot data											0
Total	8	8	12	11	14	10	11	8	9	9	100

Physics June 2018 AQA Higher P2	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total
Standard multiple choice (1 from 4)	1		2						1	1	5
Multiple choice (2 or 3 from 5)											0
Fill in words from a list											0
Calculation (1-mark)			1								1
Calculation (2-mark)					2						2
Calculation (3-mark)			3								3
Calculation (4-mark)		4		4		4					12
Calculation (5-mark)							5	5			10
1-mark recall & apply	1	2	3	1	4	1	3	1	1		17
2-mark recall & apply	2	2	4	2	2	2		2	2	2	20
3-mark recall & apply								3	3		6
4-mark recall & apply	4								4	4	12
6-mark recall & apply		6									6
Plot data		2				4					6
Total	8	16	13	7	8	11	8	11	11	7	100

Both AQA Physics Higher Papers 2018	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Average
Standard multiple choice (1 from 4)	1	0	3	0	0	0	0	0	1	1	6	3
Multiple choice (2 or 3 from 5)	0	0	2	0	0	0	0	0	0	0	2	1
Fill in words from a list	0	0	0	0	2	0	0	0	0	0	2	1
Calculation (1-mark)	0	0	1	0	0	0	0	0	0	0	1	0.5
Calculation (2-mark)	0	2	0	2	2	0	0	0	0	0	6	3
Calculation (3-mark)	0	3	3	3	0	0	3	0	3	6	21	10.5
Calculation (4-mark)	0	4	0	4	4	4	0	0	0	0	16	8
Calculation (5-mark)	0	0	0	0	0	0	5	5	5	0	15	7.5
1-mark recall & apply	2	3	3	2	5	3	3	2	2	0	25	12.5
2-mark recall & apply	6	4	4	4	6	6	8	2	2	2	44	22
3-mark recall & apply	3	0	3	3	3	0	0	6	3	3	24	12
4-mark recall & apply	4	0	0	0	0	4	0	4	4	4	20	10
6-mark recall & apply	0	6	6	0	0	0	0	0	0	0	12	6
Plot data	0	2	0	0	0	4	0	0	0	0	6	3
Total	16	24	25	18	22	21	19	19	20	16	200	100

Primary research conducted by GCSE Prepper

Base data (Physics Higher level)

Both AQA Physics Higher Papers 2018	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Average
Standard multiple choice (1 from 4)	1	0	3	0	0	0	0	0	1	1	6	3
Multiple choice (2 or 3 from 5)	0	0	2	0	0	0	0	0	0	0	2	1
Fill in words from a list	0	0	0	0	2	0	0	0	0	0	2	1
Calculation (1-mark)	0	0	1	0	0	0	0	0	0	0	1	0.5
Calculation (2-mark)	0	2	0	2	2	0	0	0	0	0	6	3
Calculation (3-mark)	0	3	3	3	0	0	3	0	3	6	21	10.5
Calculation (4-mark)	0	4	0	4	4	4	0	0	0	0	16	8
Calculation (5-mark)	0	0	0	0	0	0	5	5	5	0	15	7.5
1-mark recall & apply	2	3	3	2	5	3	3	2	2	0	25	12.5
2-mark recall & apply	6	4	4	4	6	6	8	2	2	2	44	22
3-mark recall & apply	3	0	3	3	3	0	0	6	3	3	24	12
4-mark recall & apply	4	0	0	0	0	4	0	4	4	4	20	10
6-mark recall & apply	0	6	6	0	0	0	0	0	0	0	12	6
Plot data	0	2	0	0	0	4	0	0	0	0	6	3
Total	16	24	25	18	22	21	19	19	20	16	200	100

Question style segment	Physics Higher
Traditional multiple choice	3.0%
Other multiple choiuce	2.0%
Simple calculation (1 to 2 marks)	3.5%
Complex calculation (3+ marks)	26.0%
Simple recall & apply (1 to 2 marks)	34.5%
Complex recall & apply (3+ marks)	28.0%
Plot data on a graph	3.0%
Total	100.0%

Primary research conducted by GCSE Prepper

Appendices

Example of standard multiple choice (1 from 4) question

0 1 This question is about copper sulfate.

Blue copper sulfate turns white when it is heated.

The word equation for the reaction is:

hydrated copper sulfate ⇌ anhydrous copper sulfate + water

blue white

0 1 . 1 What name is given to hydrated copper sulfate in this reaction?

[1 mark]

Tick **one** box.

- Catalyst ☐
- Element ☐
- Product ☐
- Reactant ☐

Example of Multiple choice (2 or 3 from 5) question

0 1 . 6 Draw **one** line from each compound to the formula for the compound.

[2 marks]

Compound	Formula for the compound
Copper sulfate	CuO
	CuS
	$CuSO_4$
Water	H_2O
	H_2SO_4

Example of Fill in words from a list question

0 6 . 3 Complete the sentences.

Choose answers from the box.

[3 marks]

ceramics	**composites**	**four**	**many**
monomers	**polymers**	**two**	

Poly(styrene) is produced from small molecules called _____.

When poly(styrene) is made, _____ styrene molecules join to form large molecules.

These large molecules are called _____.

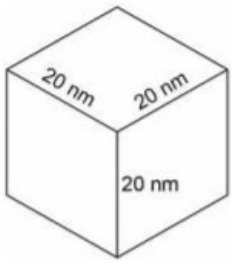
Example of 'Calculation multiple choice' question

0 1 . 7 A nanoparticle of pure metal **A** is a cube.

Each side of the cube has a length of 20 nm.

Figure 3 shows the cube.

Figure 3



What is the volume of the nanoparticle?

[1 mark]

Tick **one** box.

- 20 nm^3 ☐
- 60 nm^3 ☐
- 400 nm^3 ☐
- 8000 nm^3 ☐

Example of ‘calculation (1-mark)’ question

A student heats 2.5 g of hydrated copper sulfate in a test tube.

0.9 g of water is given off.

The remaining solid is anhydrous copper sulfate.

0 1 . 4 Calculate the mass of anhydrous copper sulfate produced.

[1 mark]

Mass of anhydrous copper sulfate = _____ g

Example of ‘calculation (2-mark)’ question

0 3 . 2 A firefighter uniform made from polymer **J** has a mass of 6.0 kg

Calculate the mass of a uniform of the same size made from polymer **K**.

Use **Table 1** and the equation:

$$\text{mass of uniform made from polymer K} = \frac{\text{density of polymer K}}{\text{density of polymer J}} \times 6.0$$

[2 marks]

Mass of uniform made from polymer **K** = _____ kg

Example of ‘calculation (3-mark)’ question

0 9 . 5 An equation for the reaction is:

$$NiO + C \rightarrow Ni + CO$$

Calculate the percentage atom economy for the reaction to produce nickel.

Relative atomic masses (A_r): C = 12 Ni = 59

Relative formula mass (M_r): NiO = 75

Give your answer to 3 significant figures.

[3 marks]

Percentage atom economy = _____ %

Example of ‘calculation (4-mark)’ question

0 8 . 7 In **Stage 2**, 40 kg of titanium chloride was added to 20 kg of sodium.

The equation for the reaction is:

$$TiCl_4 + 4\,Na \rightarrow Ti + 4\,NaCl$$

Relative atomic masses (A_r): Na = 23 Cl = 35.5 Ti = 48

Explain why titanium chloride is the limiting reactant.

You **must** show your working.

[4 marks]

Example of ‘calculation (5-mark)’ question

0 9 . 3 **Table 4** shows the student’s results.

Table 4

	Titration 1	Titration 2	Titration 3	Titration 4	Titration 5
Volume of sodium hydroxide solution in cm^3	23.50	21.10	22.10	22.15	22.15

The equation for the reaction is:

$$2\,NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2\,H_2O$$

Calculate the concentration of the sulfuric acid in mol/dm^3

Use only the student’s concordant results.

Concordant results are those within 0.10 cm^3 of each other.

[5 marks]

Concentration of sulfuric acid = _____ mol/dm^3

Example of '1-mark recall & apply' question

Methylated spirit contains ethanol and is available cheaply.

Methylated spirit also contains:

- pyridine which has a very unpleasant smell
- methyl violet which makes the mixture purple.

0 9 . 3 Suggest why pyridine and methyl violet are added to ethanol to make methylated spirit.

[1 mark]

Example of '2-mark recall & apply' question

0 3 . 5 Why is wool more sustainable than polymers **J** and **K** for making firefighter uniforms?

[2 marks]

Example of '3-mark recall & apply' question

0 8 . 6 Describe a test to show the presence of sulfate ions in the solution.

Give the result of the test if there are sulfate ions in the solution.

[3 marks]

Test _____

_____

_____

_____

Result _____

_____

Example of '4-mark recall & apply' question

0 6 . 4 **Table 4** gives some information about disposable cups.

Table 4

	Coated paper cups	Poly(styrene) cups
Source of raw materials	Wood	Crude oil
Energy to make 1 cup in arbitrary units	550	200
Biodegradable	Yes	No
Recyclable	No	Yes

Compare the advantages and disadvantages of using coated paper and poly(styrene) to make disposable cups.

Use **Table 4** and your knowledge and understanding of life cycle assessments (LCAs).

[4 marks]

Example of '5-mark recall & apply' question

0 7 . 4 A large amount of untreated sewage entered the river. Many fish died.

Untreated sewage contains organic matter and bacteria.

Explain why many fish died.

[5 marks]

Example of '6-mark recall & apply' question

The Earth's early atmosphere was different to Earth's atmosphere today.

Scientists think that the Earth's early atmosphere was like the atmosphere found on Venus today.

Table 7 shows the amounts of carbon dioxide and oxygen in the atmospheres of Venus and Earth today.

Table 7

Gas	Percentage (%) in Venus' atmosphere today	Percentage (%) in Earth's atmosphere today
Carbon dioxide	96.50	0.04
Oxygen	0.00	20.95

1 0 . 4 The percentages of carbon dioxide and oxygen have changed from Earth's early atmosphere to Earth's atmosphere today.

Explain the processes that led to these changes.

[6 marks]

Example of ‘plot data on a graph’ question

Table 3

Metal	Mass of metal in g
Gold	1.9
Silver	2.8
Copper	0.3

0 4 . 1 Plot the data for copper from **Table 3** on **Figure 1**.

[2 marks]

Figure 1