ROYAL SOCIETY OF CHEMISTRY

Chemistry for All

Reducing inequalities in chemistry aspirations and attitudes

Supplementary material

UCL Institute of Education

Chemistry for All

Reducing inequalities in chemistry aspirations and attitudes

Supplementary material – Data tables

July 2020

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1. School details: overall

Sample schools and national schools

Indicator	Sample schools (comparison schools and Chemistry for All schools)		Secondary schools in England		Difference	
	M	SD	M	SD	D	Sig. (p)
Total number of students on roll	1127.13	624.04	945.77	414.11	.436	.177
Percentage of girls on roll	47.90	19.74	49.14	17.11	.072	.766
Percentage of students: EAL (with English as an Additional (second or non-native) Language)	24.12	22.42	14.62	19.67	.482	.054
Percentage of students: FSM (eligible for Free School Meals)	27.52	14.38	15.47	10.94	**1.098**	**.001**
Percentage of students: SEN (eligible pupils with Special Educational Needs support)	17.87	8.59	13.19	7.82	**.599**	**.016**
Percentage of SEN students with a statement or EHC plan	1.62	1.45	1.91	1.45	.198	.354
Percentage of students achieving 5+ GCSEs at A* to C grades (including English and mathematics)	46.14	14.20	57.48	17.28	**.657**	**.001**

Notes: The table shows school-level information as of the start of the Chemistry for All programme (the 2014/2015 academic year); schools are the unit of analysis, not students.

Chemistry for All schools and comparison schools

Indicator	Comparison schools		Chemistry for All schools		Difference	
	M	SD	M	SD	D	Sig. (p)
Total number of students on roll	1032.33	770.22	1160.59	587.80	.202	.675
Percentage of girls on roll	45.83	6.95	48.64	22.77	.139	.773
Percentage of students: EAL (with English as an Additional (second or non-native) Language)	28.23	28.56	22.67	20.68	.244	.613
Percentage of students: FSM (eligible for Free School Meals)	29.32	21.16	26.88	11.94	.166	.730
Percentage of students: SEN (eligible pupils with Special Educational Needs support)	15.82	4.99	18.60	9.57	.320	.508
Percentage of SEN students with a statement or EHC plan	1.60	1.35	1.63	1.52	.020	.967
Percentage of students achieving 5+ GCSEs at A* to C grades (including English and mathematics)	45.80	20.41	46.24	12.67	.030	.954

Notes: The table shows school-level information as of the start of the Chemistry for All programme (the 2014/2015 academic year); schools are the unit of analysis, not students.

2. Students' changing views over time

2.1 Year by year detail: overall

Patterns of change across time across Chemistry for All and comparison students

Indicators	Younger cohort	Older cohort	Both cohorts combined
Aspirations towards science/chemistry (all)	**<.001**	.263	**<.001**
Aspirations towards science/chemistry: A-Level studying	**<.001**	.873	**.004**
Aspirations towards science/chemistry: university studying	**<.001**	.170	**.001**
Aspirations towards science/chemistry: careers	**<.001**	.163	**<.001**
Aspirations towards science careers	**.004**	.480	.347
Perceived utility of science/chemistry	**<.001**	.977	**<.001**
Interest in science/chemistry	**<.001**	**.003**	**.002**
Self-confidence in science/chemistry	**<.001**	.795	**<.001**
Value of science/chemistry to society	**.001**	.629	.057
Teaching/learning experiences: interaction/debate/discussion	**<.001**	**.004**	**<.001**
Teaching/learning experiences: practical/experimental	**<.001**	**<.001**	**<.001**
Teaching/learning experiences: relevance/applications	**<.001**	.510	**.002**
Teaching and learning experiences (all)	**<.001**	**<.001**	**<.001**
Perceptions of teachers	**<.001**	**<.001**	**<.001**
Encouragement to study science/chemistry	.061	.548	.246
Home support for science/chemistry achievement	.176	.486	.572
Extra-curricular engagement with science/chemistry	**<.001**	.057	**<.001**
Encouragement/shared extra-curricular engagement	.888	.221	.942

Notes: The table shows the significance (p-values) of the interactions of 'time × programme' from repeated measures modelling; significant interactions reflect different patterns of change across Chemistry for All and comparison students across time.

2.1.1. Aspirations towards science/chemistry (all)

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I intend to continue to study science at an A-level or equivalent
- I intend to continue to study science at university
- I would like a job that includes science when I grow up

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.54	.80	2.47	.79	.087	.153	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	2.57	.83	2.57	.81	.003	.964	2.50	.86	2.58	.82	.097	.180	2.54	.84	2.58	.81	.038	.409
Year 9	2.44	.86	2.45	.82	.006	.898	2.34	.85	2.43	.84	.112	.081	2.41	.86	2.44	.83	.036	.331
Year 10	1.83	.73	2.09	.82	**.320**	**<.001**	2.07	.75	2.14	.77	.093	.070	1.97	.75	2.11	.80	**.181**	**<.001**
Year 11	1.70	.80	1.93	.86	**.277**	**<.001**	1.57	.76	1.79	.81	**.276**	**.018**	1.67	.79	1.87	.84	**.232**	**<.001**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2395.433) = 12.803, p < .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1723.783) = 1.329, p = .263 [this reflects similar patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3942.309) = 6.657, p < .001 [this reflects different patterns of change across the groups of students across time]

2.1.2. Aspirations towards science/chemistry: A-Level studying

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I intend to continue to study science at an A-level or equivalent

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.69	.88	2.64	.87	.059	.338	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	2.76	.88	2.73	.89	.025	.678	2.63	.94	2.73	.90	.109	.133	2.71	.91	2.73	.89	.030	.517
Year 9	2.52	.96	2.51	.91	.015	.753	2.44	.92	2.54	.92	.107	.095	2.49	.95	2.52	.91	.028	.444
Year 10	1.93	.86	2.16	.92	**.246**	**<.001**	2.01	.86	2.09	.87	.094	.069	1.98	.86	2.12	.90	**.167**	**<.001**
Year 11	1.79	.98	2.00	1.00	**.214**	**.001**	1.72	1.02	1.83	.93	.120	.306	1.77	.99	1.92	.97	**.150**	**.007**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2473.033) = 7.998, p < .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1750.529) = .234, p = .873 [this reflects similar patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3997.475) = 4.458, p = .004 [this reflects different patterns of change across the groups of students across time]

2.1.3. Aspirations towards science/chemistry: university studying

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I intend to continue to study science at university

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.49	.88	2.44	.90	.051	.401	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	2.49	.96	2.50	.91	.015	.809	2.43	.95	2.51	.92	.089	.220	2.46	.95	2.50	.91	.045	.329
Year 9	2.33	.93	2.36	.92	.026	.571	2.22	.94	2.37	.91	**.159**	**.014**	2.30	.94	2.36	.92	.068	.068
Year 10	1.77	.75	2.00	.86	**.283**	**<.001**	1.81	.76	1.93	.79	**.155**	**.003**	1.79	.76	1.97	.83	**.218**	**<.001**
Year 11	1.60	.78	1.82	.85	**.262**	**<.001**	1.38	.65	1.69	.78	**.406**	**.001**	1.55	.76	1.76	.82	**.250**	**<.001**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2372.583) = 9.036, p < .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1804.639) = 1.679, p = .170 [this reflects similar patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 4066.112) = 5.491, p = .001 [this reflects different patterns of change across the groups of students across time]

2.1.4. Aspirations towards science/chemistry: careers

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I would like a job that includes science when I grow up

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.45	.93	2.33	.94	.125	.043	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	2.48	.95	2.48	.94	.009	.885	2.43	.95	2.49	.95	.067	.358	2.46	.95	2.48	.95	.022	.635
Year 9	2.47	.97	2.47	.92	.003	.956	2.36	.95	2.40	.95	.041	.523	2.43	.97	2.43	.94	.002	.965
Year 10	1.80	.79	2.08	.88	.329	<.001	2.38	.96	2.37	.96	.008	.869	2.14	.94	2.22	.93	.090	.020
Year 11	1.72	.80	1.96	.91	.281	<.001	1.61	.84	1.84	.87	.269	.022	1.69	.81	1.91	.89	.240	<.001

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2296.572) = 12.977, p < .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1676.848) = 1.711, p = .163 [this reflects similar patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 4042.550) = 6.129, p < .001 [this reflects different patterns of change across the groups of students across time]

2.1.5. Aspirations towards science careers

Single item (phrased for science at Year 7, Year 8, Year 9, Year 10, Year 11)

- I would like a job that includes science when I grow up

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.45	.93	2.33	.94	**.125**	**.043**	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	2.48	.95	2.48	.94	.009	.885	2.43	.95	2.49	.95	.067	.358	2.46	.95	2.48	.95	.022	.635
Year 9	2.47	.97	2.47	.92	.003	.956	2.36	.95	2.40	.95	.041	.523	2.43	.97	2.43	.94	.002	.965
Year 10	2.21	.95	2.38	.98	**.177**	**.002**	2.38	.96	2.37	.96	.008	.869	2.31	.96	2.38	.97	.071	.066
Year 11	2.23	1.06	2.27	1.02	.041	.525	2.39	1.07	2.22	1.03	.169	.149	2.26	1.07	2.25	1.03	.016	.768

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2305.714) = 3.887, p = .004 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1623.890) = .825, p = .480 [this reflects similar patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3866.975) = 1.102, p = .347 [this reflects similar patterns of change across the groups of students across time]

2.1.6. Perceived utility of science/chemistry

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Making an effort in science is worth it because it will help me in the work that I want to do later on
- Learning science is worthwhile for me because it will improve my chance of getting a job
- I think science is a useful subject
- I think science will help me in the job I want to do in the future
- I will learn many things in science that will help me get a job
- Science is an important subject for me because I need it for what I want to study later on
- People who are good at science get well-paid jobs

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.98	.59	2.89	.61	**.143**	**.018**	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	3.02	.59	3.00	.60	.034	.572	2.93	.78	2.99	.65	.090	.204	2.98	.68	3.00	.62	.020	.656
Year 9	2.96	.70	2.93	.65	.038	.411	2.89	.62	2.94	.62	.088	.169	2.94	.67	2.94	.63	.001	.985
Year 10	2.44	.58	2.63	.67	**.292**	**<.001**	2.53	.64	2.60	.64	**.106**	**.039**	2.49	.62	2.62	.65	**.190**	**<.001**
Year 11	2.39	.68	2.53	.71	**.196**	**.002**	2.40	.70	2.48	.66	.122	.299	2.39	.69	2.51	.69	**.163**	**.003**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2402.279) = 12.417, p < .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1700.781) = .068, p = .977 [this reflects similar patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 4012.953) = 6.562, p < .001 [this reflects different patterns of change across the groups of students across time]

2.1.7. Interest in science/chemistry

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I look forward to my science lessons
- I enjoy doing science
- Science is an interesting subject

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.98	.75	2.84	.78	**.176**	**.004**	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	2.99	.70	2.82	.71	**.246**	**<.001**	2.80	.85	2.81	.79	.015	.835	2.91	.77	2.82	.75	**.131**	**.005**
Year 9	2.75	.76	2.74	.72	.014	.764	2.72	.70	2.70	.73	.029	.652	2.74	.74	2.72	.72	.027	.459
Year 10	2.29	.76	2.57	.78	**.353**	**<.001**	2.50	.75	2.53	.74	.044	.387	2.41	.76	2.55	.76	**.179**	**<.001**
Year 11	2.43	.78	2.52	.79	.107	.103	2.34	.81	2.54	.75	**.263**	**.025**	2.41	.78	2.53	.77	**.146**	**.009**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2341.343) = 11.124, p < .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1660.983) = 4.692, p = .003 [this reflects different patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3942.235) = 5.004, p = .002 [this reflects different patterns of change across the groups of students across time]

2.1.8. Value of science/chemistry to society

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Advances in science and technology usually improve people's living conditions
- Science is important for helping us to understand the natural world
- I will use science in many ways when I am an adult
- Science is valuable to society

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	3.04	.64	2.92	.71	**.178**	**.006**	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	3.03	.64	3.04	.65	.003	.963	2.93	.79	2.94	.66	.022	.763	2.99	.71	3.00	.66	.011	.809
Year 9	3.01	.67	3.01	.64	.003	.953	3.00	.62	2.97	.68	.053	.407	3.01	.65	2.99	.66	.026	.490
Year 10	2.57	.70	2.73	.75	**.211**	**.001**	2.64	.68	2.71	.67	**.109**	**.037**	2.61	.69	2.72	.71	**.153**	**<.001**
Year 11	2.71	.73	2.77	.74	.074	.285	2.76	.68	2.73	.70	.050	.683	2.72	.72	2.75	.72	.035	.555

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2115.651) = 4.530, p = .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1398.207) = .579, p = .629 [this reflects similar patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3462.628) = 2.514, p = .057 [this reflects similar patterns of change across the groups of students across time]

2.1.9. Self-confidence in science/chemistry

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I am good at science
- I do well in science tests
- I don't need help with science
- When I am doing science, I always know what I am doing
- I do better in science than most people in my class
- I'm certain I can figure out how to do the most difficult science tasks in classes
- I am able to learn science quickly

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.55	.64	2.51	.68	.061	.333	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	2.51	.65	2.51	.63	.003	.955	2.54	.73	2.51	.67	.047	.514	2.52	.68	2.51	.65	.018	.697
Year 9	2.43	.68	2.35	.64	**.117**	**.012**	2.36	.65	2.37	.66	.009	.885	2.41	.67	2.36	.65	**.074**	**.047**
Year 10	2.00	.62	2.23	.69	**.338**	**<.001**	2.15	.65	2.20	.65	.071	.171	2.09	.64	2.22	.67	**.185**	**<.001**
Year 11	2.12	.69	2.18	.71	.085	.212	2.14	.70	2.18	.69	.057	.634	2.12	.69	2.18	.70	.080	.168

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2295.699) = 9.636, p < .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1493.054) = .342, p = .795 [this reflects similar patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3638.966) = 7.371, p < .001 [this reflects different patterns of change across the groups of students across time]

2.1.10. Teaching and learning experiences: interaction/debate/discussion

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I am given the opportunity to explain my ideas
- The lessons involve all students' opinions about the topics
- I am involved in class debate or discussion

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.88	.61	2.92	.66	.071	.251	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	2.90	.64	2.77	.64	**.196**	**.001**	2.79	.76	2.86	.66	.112	.116	2.85	.69	2.81	.65	.062	.177
Year 9	2.60	.71	2.70	.66	**.139**	**.003**	2.62	.61	2.68	.64	.093	.145	2.61	.68	2.69	.65	**.123**	**.001**
Year 10	2.42	.67	2.62	.70	**.290**	**<.001**	2.58	.66	2.61	.64	.041	.428	2.52	.67	2.62	.67	**.149**	**<.001**
Year 11	2.42	.71	2.62	.69	**.291**	**<.001**	2.49	.64	2.67	.66	**.275**	**.020**	2.43	.70	2.64	.67	**.308**	**<.001**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2437.545) = 10.800, p < .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1641.506) = 4.473, p = .004 [this reflects different patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3960.461) = 10.080, p < .001 [this reflects different patterns of change across the groups of students across time]

2.1.11. Teaching and learning experiences: practical/experimental

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I spend time in the lab doing practical experiments
- I am allowed to design my own experiments

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.53	.65	2.46	.73	.100	.103	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	2.52	.79	2.34	.73	**.243**	**<.001**	2.38	.81	2.42	.72	.061	.395	2.46	.80	2.37	.73	**.117**	**.011**
Year 9	2.33	.73	2.21	.70	**.164**	**<.001**	2.53	.63	2.23	.70	**.435**	**<.001**	2.39	.71	2.22	.70	**.241**	**<.001**
Year 10	2.08	.68	2.23	.70	**.214**	**<.001**	2.29	.71	2.20	.64	**.143**	**.005**	2.21	.70	2.22	.67	.014	.724
Year 11	1.96	.65	2.24	.73	**.391**	**<.001**	2.24	.69	2.17	.69	.103	.382	2.02	.67	2.20	.71	**.263**	**<.001**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2385.028) = 16.195, p < .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1680.905) = 11.000, p < .001 [this reflects different patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3977.891) = 16.231, p < .001 [this reflects different patterns of change across the groups of students across time]

2.1.12. Teaching and learning experiences: relevance/applications

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- The teacher uses science to help me understand the world outside school

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.86	.80	2.81	.85	.058	.351	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	2.96	.83	2.81	.88	**.168**	**.005**	2.73	.97	2.78	.86	.058	.425	2.86	.89	2.80	.87	.075	.104
Year 9	2.61	.93	2.74	.87	**.149**	**.001**	2.73	.81	2.70	.85	.040	.536	2.65	.90	2.72	.86	**.085**	**.022**
Year 10	2.38	.88	2.53	.88	**.177**	**.003**	2.37	.89	2.51	.85	**.159**	**.002**	2.38	.89	2.52	.87	**.169**	**<.001**
Year 11	2.45	.86	2.64	.85	**.219**	**.001**	2.47	.95	2.65	.83	.218	.062	2.46	.87	2.65	.84	**.224**	**<.001**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2385.752) = 7.459, p < .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1639.022) = .772, p = .510 [this reflects similar patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 4034.368) = 5.132, p = .002 [this reflects different patterns of change across the groups of students across time]

2.1.13. Teaching and learning experiences (all)

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I am given the opportunity to explain my ideas
- The lessons involve all students' opinions about the topics
- I am involved in class debate or discussion
- I spend time in the lab doing practical experiments
- I am allowed to design my own experiments
- The teacher uses science to help me understand the world outside school

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.76	.54	2.75	.60	.015	.802	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	2.79	.58	2.64	.58	**.258**	**<.001**	2.64	.72	2.70	.60	.098	.171	2.73	.64	2.66	.59	**.104**	**.024**
Year 9	2.51	.65	2.54	.60	.047	.307	2.61	.53	2.54	.58	**.131**	**.040**	2.54	.61	2.54	.59	.007	.847
Year 10	2.30	.60	2.48	.62	**.294**	**<.001**	2.45	.61	2.46	.56	.005	.915	2.39	.61	2.47	.59	**.133**	**.001**
Year 11	2.28	.60	2.50	.63	**.356**	**<.001**	2.39	.58	2.50	.59	.185	.114	2.30	.59	2.50	.61	**.325**	**<.001**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2395.969) = 13.466, p < .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1637.380) = 6.034, p < .001 [this reflects different patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3897.875) = 10.193, p < .001 [this reflects different patterns of change across the groups of students across time]

2.1.14. Perceptions of teachers

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I like my science teacher
- My science teacher believes that all students can learn science
- My science teacher is interested in me as a person
- My science teacher treats all students the same regardless of how well they can do science
- My science teacher is good at explaining science

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	3.06	.69	3.09	.70	.034	.584	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	3.17	.69	2.91	.71	**.365**	**<.001**	2.78	.89	3.04	.71	**.357**	**<.001**	3.00	.80	2.96	.71	.055	.232
Year 9	2.77	.82	2.85	.73	**.098**	**.034**	2.75	.63	2.86	.69	**.172**	**.008**	2.77	.77	2.86	.71	**.125**	**.001**
Year 10	2.67	.74	2.86	.74	**.262**	**<.001**	2.89	.74	2.90	.67	.008	.870	2.80	.75	2.88	.71	**.111**	**.004**
Year 11	2.71	.74	2.93	.70	**.303**	**<.001**	2.76	.81	3.03	.69	**.383**	**.001**	2.72	.75	2.98	.70	**.359**	**<.001**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2486.803) = 15.948, p < .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1604.359) = 12.814, p < .001 [this reflects different patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3964.313) = 8.937, p < .001 [this reflects different patterns of change across the groups of students across time]

2.1.15. Encouragement to study science/chemistry

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Someone in my family thinks that I should continue with science after my GCSEs

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.62	.95	2.55	.98	.074	.253	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	2.74	.97	2.73	.95	.007	.907	2.68	1.01	2.69	.95	.009	.908	2.71	.99	2.71	.95	.001	.984
Year 9	2.62	.98	2.67	.94	.057	.225	2.58	.94	2.66	.96	.074	.257	2.61	.97	2.66	.95	.059	.118
Year 10	2.28	.98	2.42	.97	**.146**	**.016**	2.28	.95	2.33	.91	.057	.276	2.28	.96	2.38	.94	**.102**	**.010**
Year 11	2.32	1.00	2.36	.99	.034	.615	2.16	1.00	2.29	.98	.136	.259	2.29	1.00	2.33	.99	.038	.510

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2152.356) = 2.253, p = .061 [this reflects similar patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1527.383) = .706, p = .548 [this reflects similar patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3570.654) = 1.384, p = .246 [this reflects similar patterns of change across the groups of students across time]

2.1.16. Home support for science/chemistry achievement

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Someone in my family wants me to talk to them about my science work
- Someone in my family wants me to be successful in science
- Someone in my family helps me with science homework/learning at home (via a tutor or personally)

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.66	.71	2.71	.78	.063	.329	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	2.66	.75	2.70	.74	.059	.335	2.59	.80	2.68	.76	.119	.108	2.63	.77	2.69	.75	.083	.076
Year 9	2.53	.80	2.63	.72	**.135**	**.004**	2.49	.75	2.60	.75	**.149**	**.021**	2.51	.78	2.61	.74	**.133**	**<.001**
Year 10	2.28	.78	2.40	.82	**.140**	**.022**	2.32	.77	2.40	.74	**.109**	**.036**	2.31	.77	2.40	.78	**.121**	**.002**
Year 11	2.32	.77	2.39	.82	.093	.176	2.30	.88	2.29	.78	.010	.934	2.31	.79	2.34	.80	.037	.522

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2223.325) = 1.584, p = .176 [this reflects similar patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1451.860) = .815, p = .486 [this reflects similar patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3606.855) = .668, p = .572 [this reflects similar patterns of change across the groups of students across time]

2.1.17. Extra-curricular engagement with science/chemistry

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Put on TV/radio programmes about science
- Read about science topics in books, science magazines, science articles in newspapers
- Visit websites about science topics
- Attend a science club

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	1.64	.65	1.67	.69	.043	.501	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	1.67	.66	1.67	.68	.009	.884	1.56	.63	1.61	.64	.084	.260	1.62	.65	1.64	.67	.027	.568
Year 9	1.56	.65	1.60	.61	.066	.161	1.59	.70	1.57	.64	.033	.606	1.57	.66	1.58	.62	.026	.487
Year 10	1.41	.55	1.64	.71	**.338**	**<.001**	1.47	.61	1.54	.61	.103	.050	1.45	.59	1.58	.66	**.214**	**<.001**
Year 11	1.63	.66	1.76	.73	**.187**	**.007**	1.60	.64	1.69	.69	.134	.271	1.62	.65	1.73	.71	**.148**	**.012**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2124.850) = 5.607, p < .001 [this reflects different patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1436.770) = 2.507, p = .057 [this reflects similar patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3521.951) = 5.985, p < .001 [this reflects different patterns of change across the groups of students across time]

2.1.18. Encouragement/shared extra-curricular engagement

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Do you do any of the above with someone from your family
- Are you encouraged to do any of the above by someone from your family

Observed responses (averages per year; 1-4 scales)

Time	Younger cohort						Older cohort						Both cohorts combined					
	Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference		Comparison students		Chemistry for All students		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	1.86	.84	1.87	.88	.011	.861	-	-	-	-	-	-	-	-	-	-	-	-
Year 8	1.88	.88	1.86	.88	.016	.801	1.78	.86	1.78	.86	.006	.941	1.84	.87	1.83	.87	.007	.876
Year 9	1.69	.82	1.69	.77	.001	.986	1.69	.83	1.72	.80	.035	.592	1.69	.82	1.70	.78	.017	.661
Year 10	2.02	.89	1.98	.90	.041	.507	1.54	.75	1.61	.73	.085	.104	1.73	.84	1.79	.84	.065	.104
Year 11	2.01	.89	1.97	.87	.037	.592	2.05	.95	1.95	.88	.111	.362	2.01	.91	1.96	.87	.061	.306

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling:

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2173.475) = .284, p = .888 [this reflects similar patterns of change across the groups of students across time]

Older cohort repeated measures modelling 'time × programme': F (3.000, 1465.239) = 1.470, p = .221 [this reflects similar patterns of change across the groups of students across time]

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3673.251) = .131, p = .942 [this reflects similar patterns of change across the groups of students across time]

2.2. Year by year detail: by engagement

Patterns of change across time across Chemistry for All and comparison students

Indicator	Younger cohort			Older cohort			Both cohorts		
	Chemistry for All and comparison students	Attended at least one optional event within Chemistry for All and comparison students	Attended more than one optional event within Chemistry for All and comparison students	Chemistry for All and comparison students	Attended at least one optional event within Chemistry for All and comparison students	Attended more than one optional event within Chemistry for All and comparison students	Chemistry for All and comparison students	Attended at least one optional event within Chemistry for All and comparison students	Attended more than one optional event within Chemistry for All and comparison students
Aspirations towards science/chemistry (all)	**<.001**	**<.001**	**<.001**	.263	.171	**.027**	**<.001**	**<.001**	**.001**
Aspirations towards science/chemistry: A-Level studying	**<.001**	**<.001**	**<.001**	.873	.537	.231	**.004**	**.002**	**.004**
Aspirations towards science/chemistry: university studying	**<.001**	**<.001**	**.003**	.170	.341	**.033**	**.001**	**.003**	**.007**
Aspirations towards science/chemistry: careers	**<.001**	**<.001**	**<.001**	.163	.113	.069	**<.001**	**.001**	**.013**
Aspirations towards science careers	**.004**	**.006**	**.004**	.480	.130	.209	.347	.107	.091
Perceived utility of science/chemistry	**<.001**	**<.001**	**<.001**	.977	.875	.685	**<.001**	**<.001**	**.001**
Interest in science/chemistry	**<.001**	**<.001**	**<.001**	**.003**	.080	.064	**.002**	**<.001**	**.020**
Self-confidence in science/chemistry	**<.001**	**<.001**	**<.001**	.795	.617	.107	**<.001**	**<.001**	**.002**
Value of science/chemistry to society	**.001**	**<.001**	**.001**	.629	.860	.740	.057	.055	.065
Teaching/learning experiences: interaction/debate/discussion	**<.001**	**<.001**	**<.001**	**.004**	.063	**.049**	**<.001**	**<.001**	**<.001**
Teaching/learning experiences: practical/experimental	**<.001**	**<.001**	**<.001**	**<.001**	**.001**	**<.001**	**<.001**	**<.001**	**<.001**
Teaching/learning experiences: relevance/applications	**<.001**	**<.001**	**<.001**	.510	.678	.270	**.002**	**.001**	**.012**
Teaching and learning experiences (all)	**<.001**	**<.001**	**<.001**	**<.001**	**.025**	**.006**	**<.001**	**<.001**	**<.001**
Perceptions of teachers	**<.001**	**<.001**	**<.001**	**<.001**	**<.001**	**.001**	**<.001**	**<.001**	**.007**
Encouragement to study science/chemistry	.061	**.008**	.093	.548	.280	**.032**	.246	**.034**	.140
Home support for science/chemistry achievement	.176	**.039**	.087	.486	.516	.310	.572	.463	.315
Extra-curricular engagement with science/chemistry	**<.001**	**<.001**	**.003**	.057	.173	.818	**<.001**	**<.001**	**.028**
Encouragement/shared extra-curricular engagement	.888	.944	.599	.221	.253	.602	.942	.283	.103

Notes: The table shows the significance (p-values) of the interactions of 'time × programme/attendance' from repeated measures modelling; significant interactions reflect different patterns of change across the relevant groups of students across time.

2.2.1 Aspirations towards science/chemistry (all)

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I intend to continue to study science at an A-level or equivalent
- I intend to continue to study science at university
- I would like a job that includes science when I grow up

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Aspirations towards science/chemistry (all)

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/ event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.54	.80	2.47	.79	.087	.153	2.52	.80	.023	.759	2.53	.83	.007	.933
Year 8	2.57	.83	2.57	.81	.003	.964	2.66	.79	.101	.144	2.70	.82	**.157**	**.046**
Year 9	2.44	.86	2.45	.82	.006	.898	2.59	.81	**.177**	**.003**	2.70	.80	**.305**	**<.001**
Year 10	1.83	.73	2.09	.82	**.320**	**<.001**	2.20	.78	**.487**	**<.001**	2.22	.78	**.521**	**<.001**
Year 11	1.70	.80	1.93	.86	**.277**	**<.001**	2.07	.90	**.436**	**<.001**	2.07	.88	**.442**	**<.001**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2395.433) = 12.803, p < .001
Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 1025.108) = 9.562, p < .001
Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 676.571) = 6.641, p < .001

Older cohort only: Aspirations towards science/chemistry (all)

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/ event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.50	.86	2.58	.82	.097	.180	2.68	.83	**.212**	**.015**	2.68	.85	.207	.053
Year 9	2.34	.85	2.43	.84	.112	.081	2.60	.83	**.305**	**<.001**	2.68	.89	**.390**	**<.001**
Year 10	2.07	.75	2.14	.77	.093	.070	2.35	.75	**.374**	**<.001**	2.42	.79	**.460**	**<.001**
Year 11	1.57	.76	1.79	.81	**.276**	**.018**	1.89	.85	**.390**	**.002**	2.00	.87	**.514**	**<.001**

Older cohort repeated measures modelling 'time × programme': F (3.000, 1723.783) = 1.329, p = .263
Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 641.007) = 1.676, p = .171
Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 372.258) = 3.103, p = .027

Both cohorts combined: Aspirations towards science/chemistry (all)

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/ event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.54	.84	2.58	.81	.038	.409	2.66	.80	**.146**	**.007**	2.70	.83	**.180**	**.004**
Year 9	2.41	.86	2.44	.83	.036	.331	2.59	.82	**.217**	**<.001**	2.69	.83	**.329**	**<.001**
Year 10	1.97	.75	2.11	.80	**.181**	**<.001**	2.27	.77	**.390**	**<.001**	2.30	.79	**.431**	**<.001**
Year 11	1.67	.79	1.87	.84	**.232**	**<.001**	1.99	.88	**.372**	**<.001**	2.04	.88	**.440**	**<.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3942.309) = 6.657, p < .001
Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1626.472) = 6.366, p < .001
Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1067.703) = 5.198, p = .001

2.2.2. Aspirations towards science/chemistry: A-Level studying

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I intend to continue to study science at an A-level or equivalent

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Aspirations towards science/chemistry: A-Level studying

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/ event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.69	.88	2.64	.87	.059	.338	2.67	.86	.022	.766	2.67	.89	.021	.811
Year 8	2.76	.88	2.73	.89	.025	.678	2.82	.84	.081	.240	2.86	.88	.115	.147
Year 9	2.52	.96	2.51	.91	.015	.753	2.64	.88	**.128**	**.030**	2.74	.86	**.241**	**.001**
Year 10	1.93	.86	2.16	.92	**.246**	**<.001**	2.29	.90	**.406**	**<.001**	2.31	.91	**.433**	**<.001**
Year 11	1.79	.98	2.00	1.00	**.214**	**.001**	2.14	1.05	**.350**	**<.001**	2.15	1.06	**.356**	**<.001**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2473.033) = 7.998, p < .001

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 1071.918) = 6.647, p < .001

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 714.877) = 5.132, p < .001

Older cohort only: Aspirations towards science/chemistry: A-Level studying

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.63	.94	2.73	.90	.109	.133	2.84	.92	**.221**	**.011**	2.83	.95	**.211**	**.048**
Year 9	2.44	.92	2.54	.92	.107	.095	2.68	.90	**.268**	**.001**	2.72	.96	**.298**	**.002**
Year 10	2.01	.86	2.09	.87	.094	.069	2.26	.87	**.293**	**<.001**	2.30	.88	**.341**	**<.001**
Year 11	1.72	1.02	1.83	.93	.120	.306	1.96	.98	.239	.059	2.04	.98	**.318**	**.026**

Older cohort repeated measures modelling 'time × programme': F (3.000, 1750.529) = .234, p = .873

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 649.592) = .725, p = .537

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 368.971) = 1.439, p = .231

Both cohorts combined: Aspirations towards science/chemistry: A-Level studying

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.71	.91	2.73	.89	.030	.517	2.83	.87	**.140**	**.010**	2.85	.90	**.158**	**.013**
Year 9	2.49	.95	2.52	.91	.028	.444	2.66	.89	**.177**	**<.001**	2.73	.90	**.256**	**<.001**
Year 10	1.98	.86	2.12	.90	**.167**	**<.001**	2.28	.89	**.345**	**<.001**	2.31	.90	**.382**	**<.001**
Year 11	1.77	.99	1.92	.97	**.150**	**.007**	2.06	1.02	**.280**	**<.001**	2.10	1.03	**.328**	**<.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3997.475) = 4.458, p = .004

Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1654.095) = 4.825, p = .002

Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1086.165) = 4.522, p = .004

2.2.3. Aspirations towards science/chemistry: university studying

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I intend to continue to study science at university

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Aspirations towards science/chemistry: university studying

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/ event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.49	.88	2.44	.90	.051	.401	2.50	.91	.019	.801	2.52	.92	.033	.706
Year 8	2.49	.96	2.50	.91	.015	.809	2.57	.91	.084	.230	2.62	.94	.136	.089
Year 9	2.33	.93	2.36	.92	.026	.571	2.51	.91	**.186**	**.002**	2.59	.90	**.276**	**<.001**
Year 10	1.77	.75	2.00	.86	**.283**	**<.001**	2.08	.79	**.412**	**<.001**	2.10	.79	**.434**	**<.001**
Year 11	1.60	.78	1.82	.85	**.262**	**<.001**	1.94	.88	**.412**	**<.001**	1.94	.89	**.412**	**<.001**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2372.583) = 9.036, p < .001

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 1020.422) = 6.056, p < .001

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 697.631) = 4.082, p = .003

Older cohort only: Aspirations towards science/chemistry: university studying

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/ event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.43	.95	2.51	.92	.089	.220	2.61	.92	**.193**	**.027**	2.60	.92	.183	.088
Year 9	2.22	.94	2.37	.91	**.159**	**.014**	2.50	.93	**.304**	**<.001**	2.58	.96	**.384**	**<.001**
Year 10	1.81	.76	1.93	.79	**.155**	**.003**	2.10	.79	**.369**	**<.001**	2.20	.84	**.489**	**<.001**
Year 11	1.38	.65	1.69	.78	**.406**	**.001**	1.76	.80	**.496**	**<.001**	1.87	.82	**.645**	**<.001**

Older cohort repeated measures modelling 'time × programme': F (3.000, 1804.639) = 1.679, p = .170

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 682.819) = 1.119, p = .341

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 401.695) = 2.944, p = .033

Both cohorts combined: Aspirations towards science/chemistry: university studying

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/ event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.46	.95	2.50	.91	.045	.329	2.58	.91	**.126**	**.020**	2.61	.93	**.157**	**.014**
Year 9	2.30	.94	2.36	.92	.068	.068	2.51	.92	**.222**	**<.001**	2.59	.93	**.309**	**<.001**
Year 10	1.79	.76	1.97	.83	**.218**	**<.001**	2.09	.79	**.384**	**<.001**	2.14	.81	**.442**	**<.001**
Year 11	1.55	.76	1.76	.82	**.250**	**<.001**	1.86	.85	**.373**	**<.001**	1.91	.86	**.443**	**<.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 4066.112) = 5.491, p = .001

Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1687.491) = 4.583, p = .003

Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1112.235) = 4.061, p = .007

2.2.4. Aspirations towards science/chemistry: careers

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I would like a job that includes science when I grow up

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Aspirations towards science/chemistry: careers

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/ event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.45	.93	2.33	.94	**.125**	**.043**	2.38	.97	.072	.336	2.38	.99	.065	.456
Year 8	2.48	.95	2.48	.94	.009	.885	2.58	.93	.101	.146	2.64	.93	**.162**	**.042**
Year 9	2.47	.97	2.47	.92	.003	.956	2.62	.93	**.157**	**.008**	2.76	.92	**.302**	**<.001**
Year 10	1.80	.79	2.08	.88	**.329**	**<.001**	2.21	.87	**.490**	**<.001**	2.23	.88	**.511**	**<.001**
Year 11	1.72	.80	1.96	.91	**.281**	**<.001**	2.12	.94	**.455**	**<.001**	2.10	.93	**.451**	**<.001**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2296.572) = 12.977, p < .001

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 1011.141) = 10.240, p < .001

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 670.948) = 6.657, p < .001

Older cohort only: Aspirations towards science/chemistry: careers

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/ event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.43	.95	2.49	.95	.067	.358	2.59	.94	**.175**	**.046**	2.60	.99	.177	.102
Year 9	2.36	.95	2.40	.95	.041	.523	2.60	.93	**.254**	**.001**	2.72	.95	**.382**	**<.001**
Year 10	2.38	.96	2.37	.96	.008	.869	2.67	.95	**.304**	**<.001**	2.74	.96	**.375**	**<.001**
Year 11	1.61	.84	1.84	.87	**.269**	**.022**	1.95	.93	**.377**	**.003**	2.06	.96	**.495**	**.001**

Older cohort repeated measures modelling 'time × programme': F (3.000, 1676.848) = 1.711, p = .163

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 645.111) = 1.996, p = .113

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 374.761) = 2.387, p = .069

Both cohorts combined: Aspirations towards science/chemistry: careers

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/ event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.46	.95	2.48	.95	.022	.635	2.58	.93	**.130**	**.016**	2.62	.95	**.172**	**.007**
Year 9	2.43	.97	2.43	.94	.002	.965	2.61	.93	**.184**	**<.001**	2.74	.93	**.323**	**<.001**
Year 10	2.14	.94	2.22	.93	**.090**	**.020**	2.42	.93	**.299**	**<.001**	2.43	.95	**.310**	**<.001**
Year 11	1.69	.81	1.91	.89	**.240**	**<.001**	2.04	.94	**.386**	**<.001**	2.08	.94	**.448**	**<.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 4042.550) = 6.129, p < .001

Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1696.752) = 5.202, p = .001

Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1097.516) = 3.582, p = .013

2.2.5. Aspirations towards science careers

Single item (phrased for science at Year 7, Year 8, Year 9, Year 10, Year 11)

- I would like a job that includes science when I grow up

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Aspirations towards science careers

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.45	.93	2.33	.94	.125	.043	2.38	.97	.072	.336	2.38	.99	.065	.456
Year 8	2.48	.95	2.48	.94	.009	.885	2.58	.93	.101	.146	2.64	.93	**.162**	**.042**
Year 9	2.47	.97	2.47	.92	.003	.956	2.62	.93	**.157**	**.008**	2.76	.92	**.302**	**<.001**
Year 10	2.21	.95	2.38	.98	.177	.002	2.50	.93	**.310**	**<.001**	2.56	.93	**.374**	**<.001**
Year 11	2.23	1.06	2.27	1.02	.041	.525	2.47	1.05	**.229**	**.004**	2.47	1.06	**.225**	**.014**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2305.714) = 3.887, p = .004

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 995.970) = 3.652, p = .006

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 657.803) = 3.892, p = .004

Older cohort only: Aspirations towards science careers

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.43	.95	2.49	.95	.067	.358	2.59	.94	**.175**	**.046**	2.60	.99	.177	.102
Year 9	2.36	.95	2.40	.95	.041	.523	2.60	.93	**.254**	**.001**	2.72	.95	**.382**	**<.001**
Year 10	2.38	.96	2.37	.96	.008	.869	2.67	.95	**.304**	**<.001**	2.74	.96	**.375**	**<.001**
Year 11	2.39	1.07	2.22	1.03	.169	.149	2.41	1.07	.016	.897	2.55	1.07	.146	.304

Older cohort repeated measures modelling 'time × programme': F (3.000, 1623.890) = .825, p = .480

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 628.669) = 1.888, p = .130

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 362.881) = 1.519, p = .209

Both cohorts combined: Aspirations towards science careers

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.46	.95	2.48	.95	.022	.635	2.58	.93	**.130**	**.016**	2.62	.95	**.172**	**.007**
Year 9	2.43	.97	2.43	.94	.002	.965	2.61	.93	**.184**	**<.001**	2.74	.93	**.323**	**<.001**
Year 10	2.31	.96	2.38	.97	.071	.066	2.57	.94	**.283**	**<.001**	2.63	.95	**.339**	**<.001**
Year 11	2.26	1.07	2.25	1.03	.016	.768	2.44	1.06	**.169**	**.009**	2.50	1.06	**.223**	**.003**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3866.975) = 1.102, p = .347

Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1606.307) = 2.038, p = .107

Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1035.188) = 2.162, p = .091

2.2.6. Perceived utility of science/chemistry

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Making an effort in science is worth it because it will help me in the work that I want to do later on
- Learning science is worthwhile for me because it will improve my chance of getting a job
- I think science is a useful subject
- I think science will help me in the job I want to do in the future
- I will learn many things in science that will help me get a job
- Science is an important subject for me because I need it for what I want to study later on
- People who are good at science get well-paid jobs

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Perceived utility of science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.98	.59	2.89	.61	**.143**	**.018**	2.94	.59	.063	.391	2.96	.60	.030	.725
Year 8	3.02	.59	3.00	.60	.034	.572	3.08	.57	.105	.127	3.13	.54	**.189**	**.016**
Year 9	2.96	.70	2.93	.65	.038	.411	3.06	.60	**.157**	**.007**	3.15	.60	**.287**	**<.001**
Year 10	2.44	.58	2.63	.67	**.292**	**<.001**	2.76	.62	**.521**	**<.001**	2.76	.63	**.523**	**<.001**
Year 11	2.39	.68	2.53	.71	**.196**	**.002**	2.72	.68	**.485**	**<.001**	2.74	.69	**.512**	**<.001**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2402.279) = 12.417, p < .001
Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 1038.404) = 14.379, p < .001
Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 658.923) = 9.456, p < .001

Older cohort only: Perceived utility of science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.93	.78	2.99	.65	.090	.204	3.10	.63	**.241**	**.005**	3.12	.65	**.262**	**.013**
Year 9	2.89	.62	2.94	.62	.088	.169	3.09	.62	**.322**	**<.001**	3.12	.68	**.359**	**<.001**
Year 10	2.53	.64	2.60	.64	**.106**	**.039**	2.74	.62	**.333**	**<.001**	2.75	.60	**.351**	**<.001**
Year 11	2.40	.70	2.48	.66	.122	.299	2.60	.66	**.308**	**.015**	2.67	.65	**.399**	**.005**

Older cohort repeated measures modelling 'time × programme': F (3.000, 1700.781) = .068, p = .977
Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 611.240) = .230, p = .875
Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 359.864) = .497, p = .685

Both cohorts combined: Perceived utility of science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.98	.68	3.00	.62	.020	.656	3.09	.59	**.166**	**.002**	3.13	.58	**.225**	**<.001**
Year 9	2.94	.67	2.94	.63	.001	.985	3.07	.61	**.211**	**<.001**	3.14	.63	**.304**	**<.001**
Year 10	2.49	.62	2.62	.65	**.190**	**<.001**	2.75	.62	**.414**	**<.001**	2.75	.62	**.424**	**<.001**
Year 11	2.39	.69	2.51	.69	**.163**	**.003**	2.67	.68	**.404**	**<.001**	2.71	.68	**.468**	**<.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 4012.953) = 6.562, p < .001
Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1653.546) = 7.949, p < .001
Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1030.285) = 5.478, p = .001

2.2.7. Interest in science/chemistry

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I look forward to my science lessons
- I enjoy doing science
- Science is an interesting subject

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Interest in science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.98	.75	2.84	.78	**.176**	**.004**	2.92	.72	.082	.265	2.92	.75	.082	.345
Year 8	2.99	.70	2.82	.71	**.246**	**<.001**	2.97	.65	.035	.611	3.04	.64	.075	.343
Year 9	2.75	.76	2.74	.72	.014	.764	2.88	.67	**.178**	**.002**	2.95	.65	**.280**	**<.001**
Year 10	2.29	.76	2.57	.78	**.353**	**<.001**	2.77	.68	**.662**	**<.001**	2.80	.71	**.679**	**<.001**
Year 11	2.43	.78	2.52	.79	.107	.103	2.73	.68	**.406**	**<.001**	2.76	.67	**.437**	**<.001**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2341.343) = 11.124, p < .001
Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 1024.893) = 12.562, p < .001
Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 665.218) = 8.353, p < .001

Older cohort only: Interest in science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.80	.85	2.81	.79	.015	.835	2.95	.79	**.177**	**.038**	3.07	.73	**.333**	**.002**
Year 9	2.72	.70	2.70	.73	.029	.652	2.90	.70	**.262**	**.001**	2.95	.72	**.334**	**<.001**
Year 10	2.50	.75	2.53	.74	.044	.387	2.74	.70	**.325**	**<.001**	2.79	.70	**.401**	**<.001**
Year 11	2.34	.81	2.54	.75	**.263**	**.025**	2.70	.72	**.491**	**<.001**	2.78	.65	**.620**	**<.001**

Older cohort repeated measures modelling 'time × programme': F (3.000, 1660.983) = 4.692, p = .003
Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 631.624) = 2.262, p = .080
Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 372.716) = 2.442, p = .064

Both cohorts combined: Interest in science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.91	.77	2.82	.75	**.131**	**.005**	2.96	.70	.064	.231	3.05	.67	**.189**	**.003**
Year 9	2.74	.74	2.72	.72	.027	.459	2.89	.68	**.208**	**<.001**	2.95	.68	**.297**	**<.001**
Year 10	2.41	.76	2.55	.76	**.179**	**<.001**	2.75	.69	**.467**	**<.001**	2.80	.71	**.513**	**<.001**
Year 11	2.41	.78	2.53	.77	**.146**	**.009**	2.72	.70	**.412**	**<.001**	2.77	.66	**.481**	**<.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3942.235) = 5.004, p = .002
Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1646.609) = 6.732, p < .001
Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1046.701) = 3.293, p = .020

2.2.8. Value of science/chemistry to society

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Advances in science and technology usually improve people's living conditions
- Science is important for helping us to understand the natural world
- I will use science in many ways when I am an adult
- Science is valuable to society

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Value of science/chemistry to society

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	3.04	.64	2.92	.71	**.178**	**.006**	2.97	.70	.105	.185	3.00	.70	.063	.495
Year 8	3.03	.64	3.04	.65	.003	.963	3.15	.59	**.192**	**.006**	3.20	.57	**.269**	**.001**
Year 9	3.01	.67	3.01	.64	.003	.953	3.11	.61	**.151**	**.011**	3.18	.55	**.263**	**<.001**
Year 10	2.57	.70	2.73	.75	**.211**	**.001**	2.86	.64	**.432**	**<.001**	2.92	.70	**.490**	**<.001**
Year 11	2.71	.73	2.77	.74	.074	.285	2.93	.70	**.310**	**<.001**	3.01	.65	**.431**	**<.001**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2115.651) = 4.530, p = .001

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 913.245) = 5.851, p < .001

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 607.632) = 4.957, p = .001

Older cohort only: Value of science/chemistry to society

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.93	.79	2.94	.66	.022	.763	3.03	.65	.152	.090	3.05	.64	.170	.124
Year 9	3.00	.62	2.97	.68	.053	.407	3.14	.63	**.215**	**.006**	3.17	.66	**.265**	**.005**
Year 10	2.64	.68	2.71	.67	**.109**	**.037**	2.84	.64	**.296**	**<.001**	2.90	.65	**.389**	**<.001**
Year 11	2.76	.68	2.73	.70	.050	.683	2.84	.66	.116	.375	2.90	.65	.211	.153

Older cohort repeated measures modelling 'time × programme': F (3.000, 1398.207) = .579, p = .629

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 575.746) = .251, p = .860

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 312.498) = .419, p = .740

Both cohorts combined: Value of science/chemistry to society

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.99	.71	3.00	.66	.011	.809	3.11	.61	**.185**	**.001**	3.15	.59	**.248**	**<.001**
Year 9	3.01	.65	2.99	.66	.026	.490	3.12	.61	**.178**	**<.001**	3.17	.60	**.264**	**<.001**
Year 10	2.61	.69	2.72	.71	**.153**	**<.001**	2.85	.64	**.355**	**<.001**	2.91	.68	**.433**	**<.001**
Year 11	2.72	.72	2.75	.72	.035	.555	2.89	.68	**.237**	**<.001**	2.97	.65	**.354**	**<.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3462.628) = 2.514, p = .057

Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1485.774) = 2.543, p = .055

Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 928.821) = 2.416, p = .065

2.2.9. Self-confidence in science/chemistry

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I am good at science
- I do well in science tests
- I don't need help with science
- When I am doing science, I always know what I am doing
- I do better in science than most people in my class
- I'm certain I can figure out how to do the most difficult science tasks in classes
- I am able to learn science quickly

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Self-confidence in science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.55	.64	2.51	.68	.061	.333	2.56	.66	.016	.833	2.58	.66	.046	.603
Year 8	2.51	.65	2.51	.63	.003	.955	2.57	.62	.100	.148	2.63	.62	**.190**	**.017**
Year 9	2.43	.68	2.35	.64	**.117**	**.012**	2.45	.63	.036	.545	2.51	.64	.127	.077
Year 10	2.00	.62	2.23	.69	**.338**	**<.001**	2.37	.65	**.576**	**<.001**	2.41	.67	**.630**	**<.001**
Year 11	2.12	.69	2.18	.71	.085	.212	2.29	.70	**.249**	**.003**	2.28	.71	**.235**	**.014**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2295.699) = 9.636, p < .001

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 1030.637) = 8.710, p < .001

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 686.120) = 5.355, p < .001

Older cohort only: Self-confidence in science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.54	.73	2.51	.67	.047	.514	2.59	.65	.072	.403	2.55	.63	.013	.904
Year 9	2.36	.65	2.37	.66	.009	.885	2.52	.64	**.246**	**.001**	2.58	.65	**.343**	**<.001**
Year 10	2.15	.65	2.20	.65	.071	.171	2.33	.67	**.273**	**<.001**	2.40	.64	**.382**	**<.001**
Year 11	2.14	.70	2.18	.69	.057	.634	2.27	.70	.191	.138	2.33	.65	**.289**	**.047**

Older cohort repeated measures modelling 'time × programme': F (3.000, 1493.054) = .342, p = .795

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 587.909) = .598, p = .617

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 321.965) = 2.050, p = .107

Both cohorts combined: Self-confidence in science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.52	.68	2.51	.65	.018	.697	2.58	.63	.087	.109	2.60	.62	**.124**	**.049**
Year 9	2.41	.67	2.36	.65	**.074**	**.047**	2.48	.63	**.113**	**.015**	2.54	.65	**.201**	**<.001**
Year 10	2.09	.64	2.22	.67	**.185**	**<.001**	2.35	.66	**.399**	**<.001**	2.41	.66	**.481**	**<.001**
Year 11	2.12	.69	2.18	.70	.080	.168	2.28	.70	**.230**	**.001**	2.30	.68	**.263**	**.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3638.966) = 7.371, p < .001

Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1565.746) = 6.837, p < .001

Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 967.682) = 4.878, p = .002

2.2.10. Teaching and learning experiences: interaction/debate/discussion

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I am given the opportunity to explain my ideas
- The lessons involve all students' opinions about the topics
- I am involved in class debate or discussion

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Teaching and learning experiences: interaction/debate/discussion

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.88	.61	2.92	.66	.071	.251	2.95	.61	.120	.107	2.96	.61	.145	.095
Year 8	2.90	.64	2.77	.64	**.196**	**.001**	2.85	.65	.071	.301	2.86	.68	.059	.453
Year 9	2.60	.71	2.70	.66	**.139**	**.003**	2.79	.62	**.278**	**<.001**	2.81	.63	**.309**	**<.001**
Year 10	2.42	.67	2.62	.70	**.290**	**<.001**	2.77	.59	**.563**	**<.001**	2.79	.59	**.579**	**<.001**
Year 11	2.42	.71	2.62	.69	**.291**	**<.001**	2.77	.59	**.540**	**<.001**	2.78	.60	**.529**	**<.001**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2437.545) = 10.800, p < .001

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 991.588) = 13.037, p < .001

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 674.701) = 9.742, p < .001

Older cohort only: Teaching and learning experiences: interaction/debate/discussion

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.79	.76	2.86	.66	.112	.116	2.98	.63	**.283**	**.001**	3.11	.60	**.459**	**<.001**
Year 9	2.62	.61	2.68	.64	.093	.145	2.82	.64	**.319**	**<.001**	2.87	.59	**.412**	**<.001**
Year 10	2.58	.66	2.61	.64	.041	.428	2.71	.59	**.208**	**.002**	2.76	.61	**.270**	**.002**
Year 11	2.49	.64	2.67	.66	**.275**	**.020**	2.67	.69	**.266**	**.037**	2.78	.64	**.458**	**.002**

Older cohort repeated measures modelling 'time × programme': F (3.000, 1641.506) = 4.473, p = .004

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 610.837) = 2.443, p = .063

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 349.166) = 2.653, p = .049

Both cohorts combined: Teaching and learning experiences: interaction/debate/discussion

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.85	.69	2.81	.65	.062	.177	2.90	.65	.071	.186	2.94	.67	**.128**	**.042**
Year 9	2.61	.68	2.69	.65	**.123**	**.001**	2.80	.63	**.298**	**<.001**	2.84	.61	**.347**	**<.001**
Year 10	2.52	.67	2.62	.67	**.149**	**<.001**	2.75	.59	**.365**	**<.001**	2.78	.60	**.405**	**<.001**
Year 11	2.43	.70	2.64	.67	**.308**	**<.001**	2.72	.64	**.435**	**<.001**	2.78	.62	**.518**	**<.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3960.461) = 10.080, p < .001

Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1634.137) = 7.175, p < .001

Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1058.149) = 6.154, p < .001

2.2.11. Teaching and learning experiences: practical/experimental

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I spend time in the lab doing practical experiments
- I am allowed to design my own experiments

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Teaching and learning experiences: practical/experimental

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.53	.65	2.46	.73	.100	.103	2.43	.68	**.155**	**.037**	2.40	.69	**.197**	**.024**
Year 8	2.52	.79	2.34	.73	**.243**	**<.001**	2.43	.74	.123	.074	2.44	.75	.105	.183
Year 9	2.33	.73	2.21	.70	**.164**	**<.001**	2.28	.68	.073	.210	2.30	.70	.040	.577
Year 10	2.08	.68	2.23	.70	**.214**	**<.001**	2.37	.63	**.444**	**<.001**	2.38	.65	**.450**	**<.001**
Year 11	1.96	.65	2.24	.73	**.391**	**<.001**	2.36	.72	**.591**	**<.001**	2.42	.70	**.684**	**<.001**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2385.028) = 16.195, p < .001

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 1045.782) = 17.194, p < .001

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 712.965) = 14.215, p < .001

Older cohort only: Teaching and learning experiences: practical/experimental

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.38	.81	2.42	.72	.061	.395	2.47	.73	.124	.147	2.58	.71	**.257**	**.015**
Year 9	2.53	.63	2.23	.70	**.435**	**<.001**	2.43	.69	**.162**	**.036**	2.55	.71	.025	.788
Year 10	2.29	.71	2.20	.64	**.143**	**.005**	2.30	.62	.006	.930	2.31	.65	.023	.791
Year 11	2.24	.69	2.17	.69	.103	.382	2.28	.73	.064	.613	2.44	.73	.280	.051

Older cohort repeated measures modelling 'time × programme': F (3.000, 1680.905) = 11.000, p < .001

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 623.301) = 5.851, p = .001

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 367.877) = 7.173, p < .001

Both cohorts combined: Teaching and learning experiences: practical/experimental

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.46	.80	2.37	.73	**.117**	**.011**	2.44	.73	.023	.663	2.48	.74	.028	.651
Year 9	2.39	.71	2.22	.70	**.241**	**<.001**	2.34	.69	.073	.115	2.40	.71	.009	.874
Year 10	2.21	.70	2.22	.67	.014	.724	2.34	.63	**.196**	**<.001**	2.35	.65	**.214**	**<.001**
Year 11	2.02	.67	2.20	.71	**.263**	**<.001**	2.33	.73	**.438**	**<.001**	2.43	.71	**.593**	**<.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3977.891) = 16.231, p < .001

Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1655.794) = 11.436, p < .001

Both cohorts r measures modelling 'time × attended more than one optional activity/event': F (3.000, 1077.424) = 12.155, p < .001

2.2.12. Teaching and learning experiences: relevance/applications

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- The teacher uses science to help me understand the world outside school

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Teaching and learning experiences: relevance/applications

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.86	.80	2.81	.85	.058	.351	2.81	.85	.058	.437	2.82	.87	.051	.562
Year 8	2.96	.83	2.81	.88	**.168**	**.005**	2.91	.87	.065	.348	2.94	.87	.027	.738
Year 9	2.61	.93	2.74	.87	**.149**	**.001**	2.82	.82	**.241**	**<.001**	2.87	.80	**.293**	**<.001**
Year 10	2.38	.88	2.53	.88	**.177**	**.003**	2.67	.81	**.344**	**<.001**	2.66	.82	**.332**	**<.001**
Year 11	2.45	.86	2.64	.85	**.219**	**.001**	2.79	.80	**.406**	**<.001**	2.80	.82	**.412**	**<.001**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2385.752) = 7.459, p < .001

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 1035.388) = 8.093, p < .001

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 684.385) = 5.975, p < .001

Older cohort only: Teaching and learning experiences: relevance/applications

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.73	.97	2.78	.86	.058	.425	2.84	.89	.120	.167	2.94	.88	**.232**	**.031**
Year 9	2.73	.81	2.70	.85	.040	.536	2.89	.83	**.188**	**.015**	2.87	.84	.175	.065
Year 10	2.37	.89	2.51	.85	**.159**	**.002**	2.69	.80	**.375**	**<.001**	2.74	.84	**.421**	**<.001**
Year 11	2.47	.95	2.65	.83	.218	.062	2.74	.79	**.333**	**.009**	2.84	.75	**.452**	**.002**

Older cohort repeated measures modelling 'time × programme': F (3.000, 1639.022) = .772, p = .510

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 635.223) = .506, p = .678

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 360.297) = 1.313, p = .270

Both cohorts combined: Teaching and learning experiences: relevance/applications

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.86	.89	2.80	.87	.075	.104	2.88	.88	.018	.736	2.94	.87	.085	.181
Year 9	2.65	.90	2.72	.86	**.085**	**.022**	2.85	.83	**.235**	**<.001**	2.87	.81	**.260**	**<.001**
Year 10	2.38	.89	2.52	.87	**.169**	**<.001**	2.68	.81	**.359**	**<.001**	2.69	.83	**.368**	**<.001**
Year 11	2.46	.87	2.65	.84	**.224**	**<.001**	2.77	.80	**.377**	**<.001**	2.82	.79	**.431**	**<.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 4034.368) = 5.132, p = .002

Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1721.402) = 5.758, p = .001

Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1091.288) = 3.641, p = .012

2.2.13. Teaching and learning experiences (all)

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I am given the opportunity to explain my ideas
- The lessons involve all students' opinions about the topics
- I am involved in class debate or discussion
- I spend time in the lab doing practical experiments
- I am allowed to design my own experiments
- The teacher uses science to help me understand the world outside school

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Teaching and learning experiences (all)

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.76	.54	2.75	.60	.015	.802	2.75	.55	.013	.862	2.75	.55	.008	.923
Year 8	2.79	.58	2.64	.58	**.258**	**<.001**	2.72	.60	.111	.108	2.73	.63	.086	.274
Year 9	2.51	.65	2.54	.60	.047	.307	2.62	.57	**.181**	**.002**	2.65	.57	**.222**	**.002**
Year 10	2.30	.60	2.48	.62	**.294**	**<.001**	2.62	.52	**.585**	**<.001**	2.63	.54	**.582**	**<.001**
Year 11	2.28	.60	2.50	.63	**.356**	**<.001**	2.64	.56	**.636**	**<.001**	2.67	.56	**.671**	**<.001**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2395.969) = 13.466, p < .001

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 1017.504) = 16.701, p < .001

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 684.803) = 12.493, p < .001

Older cohort only: Teaching and learning experiences (all)

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.64	.72	2.70	.60	.098	.171	2.79	.59	**.230**	**.007**	2.90	.57	**.394**	**<.001**
Year 9	2.61	.53	2.54	.58	**.131**	**.040**	2.70	.58	**.163**	**.034**	2.77	.57	**.289**	**.002**
Year 10	2.45	.61	2.46	.56	.005	.915	2.57	.53	**.205**	**.002**	2.60	.55	**.256**	**.003**
Year 11	2.39	.58	2.50	.59	.185	.114	2.55	.63	**.266**	**.036**	2.67	.60	**.486**	**.001**

Older cohort repeated measures modelling 'time × programme': F (3.000, 1637.380) = 6.034, p < .001

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 606.050) = 3.129, p = .025

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 349.505) = 4.275, p = .006

Both cohorts combined: Teaching and learning experiences (all)

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.73	.64	2.66	.59	**.104**	**.024**	2.75	.60	.032	.551	2.79	.62	.098	.120
Year 9	2.54	.61	2.54	.59	.007	.847	2.66	.57	**.192**	**<.001**	2.70	.57	**.256**	**<.001**
Year 10	2.39	.61	2.47	.59	**.133**	**.001**	2.60	.52	**.370**	**<.001**	2.62	.54	**.396**	**<.001**
Year 11	2.30	.59	2.50	.61	**.325**	**<.001**	2.60	.59	**.507**	**<.001**	2.67	.58	**.633**	**<.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3897.875) = 10.193, p < .001

Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1630.549) = 8.210, p < .001

Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1055.983) = 8.181, p < .001

2.2.14. Perceptions of teachers

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I like my science teacher
- My science teacher believes that all students can learn science
- My science teacher is interested in me as a person
- My science teacher treats all students the same regardless of how well they can do science
- My science teacher is good at explaining science

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Perceptions of teachers

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	3.06	.69	3.09	.70	.034	.584	3.17	.63	**.153**	**.041**	3.20	.62	**.197**	**.025**
Year 8	3.17	.69	2.91	.71	**.365**	**<.001**	3.03	.70	**.198**	**.004**	3.05	.71	**.169**	**.033**
Year 9	2.77	.82	2.85	.73	**.098**	**.034**	2.96	.68	**.250**	**<.001**	3.00	.66	**.286**	**<.001**
Year 10	2.67	.74	2.86	.74	**.262**	**<.001**	2.99	.64	**.467**	**<.001**	3.01	.65	**.479**	**<.001**
Year 11	2.71	.74	2.93	.70	**.303**	**<.001**	3.05	.65	**.478**	**<.001**	3.07	.65	**.502**	**<.001**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2486.803) = 15.948, p < .001

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 1050.084) = 11.455, p < .001

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 696.455) = 8.774, p < .001

Older cohort only: Perceptions of teachers

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.78	.89	3.04	.71	**.357**	**<.001**	3.16	.65	**.503**	**<.001**	3.30	.55	**.671**	**<.001**
Year 9	2.75	.63	2.86	.69	**.172**	**.008**	3.06	.63	**.488**	**<.001**	3.11	.61	**.577**	**<.001**
Year 10	2.89	.74	2.90	.67	.008	.870	3.05	.61	**.231**	**.001**	3.10	.62	**.295**	**.001**
Year 11	2.76	.81	3.03	.69	**.383**	**.001**	3.12	.72	**.482**	**<.001**	3.21	.66	**.614**	**<.001**

Older cohort repeated measures modelling 'time × programme': F (3.000, 1604.359) = 12.814, p < .001

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 602.111) = 7.616, p < .001

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 327.605) = 6.056, p = .001

Both cohorts combined: Perceptions of teachers

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	3.00	.80	2.96	.71	.055	.232	3.08	.68	.096	.075	3.13	.67	**.165**	**.009**
Year 9	2.77	.77	2.86	.71	**.125**	**.001**	3.00	.66	**.332**	**<.001**	3.04	.64	**.376**	**<.001**
Year 10	2.80	.75	2.88	.71	**.111**	**.004**	3.02	.63	**.314**	**<.001**	3.05	.64	**.343**	**<.001**
Year 11	2.72	.75	2.98	.70	**.359**	**<.001**	3.08	.68	**.499**	**<.001**	3.12	.66	**.561**	**<.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3964.313) = 8.937, p < .001

Both cohorts r measures modelling 'time × attended at least one optional activity/event': F (3.000, 1614.223) = 6.236, p < .001

Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1047.990) = 4.034, p = .007

2.2.15. Encouragement to study science/chemistry

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Someone in my family thinks that I should continue with science after my GCSEs

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Encouragement to study science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.62	.95	2.55	.98	.074	.253	2.58	.99	.042	.592	2.65	.99	.027	.767
Year 8	2.74	.97	2.73	.95	.007	.907	2.80	.92	.067	.343	2.88	.91	.153	.058
Year 9	2.62	.98	2.67	.94	.057	.225	2.84	.92	**.228**	**<.001**	2.91	.91	**.305**	**<.001**
Year 10	2.28	.98	2.42	.97	**.146**	**.016**	2.58	.91	**.325**	**<.001**	2.61	.95	**.343**	**<.001**
Year 11	2.32	1.00	2.36	.99	.034	.615	2.52	.98	**.202**	**.015**	2.47	.97	.148	.126

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2152.356) = 2.253, p = .061

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 948.405) = 3.454, p = .008

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 659.059) = 2.001, p = .093

Older cohort only: Encouragement to study science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.68	1.01	2.69	.95	.009	.908	2.78	.95	.104	.248	2.74	.89	.058	.602
Year 9	2.58	.94	2.66	.96	.074	.257	2.79	.93	**.224**	**.004**	2.78	.96	**.205**	**.033**
Year 10	2.28	.95	2.33	.91	.057	.276	2.55	.88	**.288**	**<.001**	2.53	.86	**.273**	**.002**
Year 11	2.16	1.00	2.29	.98	.136	.259	2.47	.98	**.318**	**.015**	2.56	.96	**.408**	**.006**

Older cohort repeated measures modelling 'time × programme': F (3.000, 1527.383) = .706, p = .548

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 599.462) = 1.280, p = .280

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 348.578) = 2.964, p = .032

Both cohorts combined: Encouragement to study science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.71	.99	2.71	.95	.001	.984	2.79	.93	.083	.134	2.84	.91	**.129**	**.046**
Year 9	2.61	.97	2.66	.95	.059	.118	2.82	.92	**.221**	**<.001**	2.86	.94	**.261**	**<.001**
Year 10	2.28	.96	2.38	.94	**.102**	**.010**	2.56	.90	**.308**	**<.001**	2.58	.91	**.315**	**<.001**
Year 11	2.29	1.00	2.33	.99	.038	.510	2.50	.98	**.214**	**.002**	2.51	.97	**.222**	**.005**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3570.654) = 1.384, p = .246

Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1541.008) = 2.901, p = .034

Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1010.402) = 1.830, p = .140

2.2.16. Home support for science/chemistry achievement

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Someone in my family wants me to talk to them about my science work
- Someone in my family wants me to be successful in science
- Someone in my family helps me with science homework/learning at home (via a tutor or personally)

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Home support for science/chemistry achievement

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	2.66	.71	2.71	.78	.063	.329	2.75	.77	.109	.161	2.76	.75	.133	.145
Year 8	2.66	.75	2.70	.74	.059	.335	2.75	.71	.125	.075	2.75	.70	.126	.116
Year 9	2.53	.80	2.63	.72	**.135**	**.004**	2.72	.69	**.263**	**<.001**	2.72	.67	**.261**	**<.001**
Year 10	2.28	.78	2.40	.82	**.140**	**.022**	2.55	.76	**.353**	**<.001**	2.59	.77	**.399**	**<.001**
Year 11	2.32	.77	2.39	.82	.093	.176	2.52	.81	**.256**	**.002**	2.51	.81	**.250**	**.011**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2223.325) = 1.584, p = .176

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 985.317) = 2.532, p = .039

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 660.992) = 2.041, p = .087

Older cohort only: Home support for science/chemistry achievement

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.59	.80	2.68	.76	.119	.108	2.76	.74	**.221**	**.013**	2.81	.68	**.298**	**.007**
Year 9	2.49	.75	2.60	.75	**.149**	**.021**	2.72	.73	**.321**	**<.001**	2.76	.75	**.371**	**<.001**
Year 10	2.32	.77	2.40	.74	**.109**	**.036**	2.53	.71	**.279**	**<.001**	2.55	.72	**.305**	**<.001**
Year 11	2.30	.88	2.29	.78	.010	.934	2.39	.79	.107	.413	2.44	.79	.162	.271

Older cohort repeated measures modelling 'time × programme': F (3.000, 1451.860) = .815, p = .486

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 558.183) = .761, p = .516

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 315.343) = 1.200, p = .310

Both cohorts combined: Home support for science/chemistry achievement

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	2.63	.77	2.69	.75	.083	.076	2.75	.72	**.165**	**.003**	2.77	.69	**.188**	**.004**
Year 9	2.51	.78	2.61	.74	**.133**	**<.001**	2.72	.71	**.281**	**<.001**	2.74	.70	**.299**	**<.001**
Year 10	2.31	.77	2.40	.78	**.121**	**.002**	2.54	.74	**.313**	**<.001**	2.57	.75	**.352**	**<.001**
Year 11	2.31	.79	2.34	.80	.037	.522	2.46	.80	**.178**	**.008**	2.48	.80	**.208**	**.008**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3606.855) = .668, p = .572

Both cohorts r measures modelling 'time × attended at least one optional activity/event': F (3.000, 1538.275) = .856, p = .463

Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 977.946) = 1.182, p = .315

2.2.17. Extra-curricular engagement with science/chemistry

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Put on TV/radio programmes about science
- Read about science topics in books, science magazines, science articles in newspapers
- Visit websites about science topics
- Attend a science club

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Extra-curricular engagement with science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	1.64	.65	1.67	.69	.043	.501	1.63	.67	.024	.758	1.66	.67	.031	.732
Year 8	1.67	.66	1.67	.68	.009	.884	1.68	.69	.018	.796	1.73	.71	.083	.302
Year 9	1.56	.65	1.60	.61	.066	.161	1.67	.63	**.173**	**.004**	1.71	.64	**.235**	**.001**
Year 10	1.41	.55	1.64	.71	**.338**	**<.001**	1.67	.66	**.435**	**<.001**	1.72	.67	**.519**	**<.001**
Year 11	1.63	.66	1.76	.73	**.187**	**.007**	1.84	.73	**.301**	**<.001**	1.83	.72	**.294**	**.003**

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2124.850) = 5.607, p < .001

Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 912.056) = 6.008, p < .001

Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 608.551) = 4.033, p = .003

Older cohort only: Extra-curricular engagement with science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	1.56	.63	1.61	.64	.084	.260	1.63	.64	.108	.227	1.64	.63	.137	.222
Year 9	1.59	.70	1.57	.64	.033	.606	1.70	.73	.150	.055	1.78	.80	**.250**	**.009**
Year 10	1.47	.61	1.54	.61	.103	.050	1.63	.66	**.241**	**<.001**	1.66	.69	**.297**	**.001**
Year 11	1.60	.64	1.69	.69	.134	.271	1.85	.76	**.346**	**.009**	1.82	.69	**.334**	**.024**

Older cohort repeated measures modelling 'time × programme': F (3.000, 1436.770) = 2.507, p = .057

Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 581.218) = 1.666, p = .173

Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 318.737) = .310, p = .818

Both cohorts combined: Extra-curricular engagement with science/chemistry

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	1.62	.65	1.64	.67	.027	.568	1.66	.67	.058	.294	1.70	.68	.117	.072
Year 9	1.57	.66	1.58	.62	.026	.487	1.68	.68	**.170**	**<.001**	1.74	.71	**.248**	**<.001**
Year 10	1.45	.59	1.58	.66	**.214**	**<.001**	1.65	.66	**.326**	**<.001**	1.69	.68	**.397**	**<.001**
Year 11	1.62	.65	1.73	.71	**.148**	**.012**	1.84	.74	**.313**	**<.001**	1.83	.71	**.301**	**<.001**

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3521.951) = 5.985, p < .001

Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1539.264) = 6.217, p < .001

Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1002.194) = 3.042, p = .028

2.2.18. Encouragement/shared extra-curricular engagement

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Do you do any of the above with someone from your family
- Are you encouraged to do any of the above by someone from your family

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Encouragement/shared extra-curricular engagement

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 7	1.86	.84	1.87	.88	.011	.861	1.83	.87	.038	.631	1.87	.87	.008	.934
Year 8	1.88	.88	1.86	.88	.016	.801	1.86	.88	.017	.807	1.86	.87	.025	.757
Year 9	1.69	.82	1.69	.77	.001	.986	1.75	.78	.070	.243	1.78	.79	.113	.122
Year 10	2.02	.89	1.98	.90	.041	.507	2.07	.87	.058	.429	2.15	.87	.153	.074
Year 11	2.01	.89	1.97	.87	.037	.592	2.02	.86	.017	.842	1.98	.80	.027	.782

Younger cohort repeated measures modelling 'time × programme': F (4.000, 2173.475) = .284, p = .888
Younger cohort repeated measures modelling 'time × attended at least one optional activity/event': F (4.000, 955.272) = .190, p = .944
Younger cohort repeated measures modelling 'time × attended more than one optional activity/event': F (4.000, 633.873) = .690, p = .599

Older cohort only: Encouragement/shared extra-curricular engagement

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	1.78	.86	1.78	.86	.006	.941	1.75	.88	.028	.754	1.78	.85	.007	.948
Year 9	1.69	.83	1.72	.80	.035	.592	1.82	.82	**.162**	**.038**	1.81	.86	.141	.140
Year 10	1.54	.75	1.61	.73	.085	.104	1.67	.76	**.174**	**.010**	1.70	.80	**.204**	**.019**
Year 11	2.05	.95	1.95	.88	.111	.362	2.03	.92	.016	.905	2.13	.94	.092	.531

Older cohort repeated measures modelling 'time × programme': F (3.000, 1465.239) = 1.470, p = .221
Older cohort repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 570.679) = 1.365, p = .253
Older cohort repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 324.347) = .620, p = .602

Both cohorts combined: Encouragement/shared extra-curricular engagement

Time	All students						Attended at least one optional activity/event				Attended more than one optional activity/event			
	Comparison students		Chemistry for All students		Difference to comparison students		Chemistry for All students: attended at least one optional activity/event		Difference to comparison students		Chemistry for All students: attended more than one optional activity/event		Difference to comparison students	
	M	SD	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)	M	SD	D	Sig. (p)
Year 8	1.84	.87	1.83	.87	.007	.876	1.82	.88	.015	.791	1.83	.87	.003	.961
Year 9	1.69	.82	1.70	.78	.017	.661	1.78	.80	**.112**	**.018**	1.79	.82	**.125**	**.031**
Year 10	1.73	.84	1.79	.84	.065	.104	1.88	.84	**.169**	**.001**	1.95	.87	**.257**	**<.001**
Year 11	2.01	.91	1.96	.87	.061	.306	2.03	.89	.014	.842	2.05	.86	.037	.640

Both cohorts repeated measures modelling 'time × programme': F (3.000, 3673.251) = .131, p = .942
Both cohorts repeated measures modelling 'time × attended at least one optional activity/event': F (3.000, 1565.117) = 1.270, p = .283
Both cohorts repeated measures modelling 'time × attended more than one optional activity/event': F (3.000, 1016.233) = 2.063, p = .103

2.3 Year by year detail: by gender

Patterns of change across time across Chemistry for All and comparison students across gender

Indicator	Younger cohort	Older cohort	Both cohorts combined
Aspirations towards science/chemistry (all)	**.006**	.154	.084
Aspirations towards science/chemistry: A-Level studying	**.014**	.181	.215
Aspirations towards science/chemistry: university studying	.065	.372	.116
Aspirations towards science/chemistry: careers	**.002**	.247	**.018**
Aspirations towards science careers	**.004**	.438	**.027**
Perceived utility of science/chemistry	**.040**	.165	.166
Interest in science/chemistry	**.007**	.198	.058
Self-confidence in science/chemistry	.220	.513	.650
Value of science/chemistry to society	**.017**	**.007**	**.014**
Teaching/learning experiences: interaction/debate/discussion	**.003**	.393	.159
Teaching/learning experiences: practical/experimental	.144	.334	.814
Teaching/learning experiences: relevance/applications	**.019**	.183	.910
Teaching and learning experiences (all)	**.005**	.179	.515
Perceptions of teachers	**.001**	.081	.449
Encouragement to study science/chemistry	.256	.133	.706
Home support for science/chemistry achievement	.402	.556	.577
Extra-curricular engagement with science/chemistry	.654	.569	.888
Encouragement/shared extra-curricular engagement	.418	.665	.227

Notes: The table shows the significance (p-values) of the interactions of 'time × programme × gender' from repeated measures modelling; significant interactions reflect different patterns of change across Chemistry for All and comparison students across time across gender.

2.3.1. Aspirations towards science/chemistry (all)

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I intend to continue to study science at an A-level or equivalent
- I intend to continue to study science at university
- I would like a job that includes science when I grow up

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Aspirations towards science/chemistry (all)

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.43	.79	2.65	.81	**.280**	**.012**	2.48	.81	2.46	.77	.020	.745
Year 8	2.60	.86	2.55	.81	.060	.583	2.53	.80	2.61	.82	**.099**	**.048**
Year 9	2.32	.86	2.59	.84	**.315**	**<.001**	2.47	.84	2.43	.81	.050	.318
Year 10	1.78	.70	1.92	.76	.195	.070	2.08	.80	2.09	.82	.014	.788
Year 11	1.53	.70	1.87	.85	**.435**	**<.001**	1.96	.86	1.92	.86	.042	.491

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2271.684) = 3.628, p = .006

Older cohort only: Aspirations towards science/chemistry (all)

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.50	.90	2.45	.84	.063	.652	2.60	.83	2.56	.80	.054	.352
Year 9	2.41	.91	2.27	.78	.173	.144	2.46	.87	2.41	.81	.050	.336
Year 10	2.03	.74	2.10	.76	.095	.287	2.16	.80	2.13	.75	.042	.427
Year 11	1.74	.84	1.48	.71	.344	.151	1.81	.80	1.78	.81	.034	.598

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1741.348) = 1.754, p = .154

Both cohorts combined: Aspirations towards science/chemistry (all)

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.56	.87	2.51	.83	.063	.465	2.56	.82	2.59	.81	.033	.385
Year 9	2.35	.88	2.49	.83	**.161**	**.014**	2.46	.85	2.42	.81	.049	.175
Year 10	1.92	.73	2.03	.76	**.146**	**.033**	2.12	.80	2.11	.79	.015	.694
Year 11	1.56	.73	1.77	.83	**.268**	**.009**	1.88	.84	1.85	.84	.038	.390

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3848.743) = 2.214, p = .084

2.3.2. Aspirations towards science/chemistry: A-Level studying

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I intend to continue to study science at an A-level or equivalent

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Aspirations towards science/chemistry: A-Level studying

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.59	.87	2.81	.89	.249	.025	2.66	.88	2.63	.87	.038	.533
Year 8	2.79	.87	2.73	.89	.071	.515	2.71	.87	2.75	.90	.039	.443
Year 9	2.40	.97	2.67	.93	**.289**	**<.001**	2.54	.92	2.48	.90	.059	.238
Year 10	1.91	.85	1.99	.89	.102	.343	2.14	.91	2.17	.93	.024	.644
Year 11	1.61	.91	1.97	1.02	**.374**	**.001**	2.03	1.02	1.98	.97	.047	.442

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2325.589) = 3.116, p = .014

Older cohort only: Aspirations towards science/chemistry: A-Level studying

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.65	.97	2.56	.94	.090	.522	2.76	.91	2.70	.90	.070	.234
Year 9	2.53	.92	2.35	.88	.203	.089	2.56	.92	2.52	.91	.041	.432
Year 10	1.97	.83	2.05	.88	.091	.312	2.10	.88	2.08	.86	.024	.648
Year 11	1.93	1.04	1.62	1.01	.304	.203	1.85	.91	1.82	.95	.033	.603

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1761.423) = 1.627, p = .181

Both cohorts combined: Aspirations towards science/chemistry: A-Level studying

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.74	.91	2.66	.92	.081	.347	2.74	.89	2.73	.90	.008	.830
Year 9	2.44	.96	2.57	.93	**.140**	**.033**	2.55	.92	2.50	.91	.053	.145
Year 10	1.94	.84	2.03	.88	.098	.154	2.12	.89	2.13	.89	.003	.930
Year 11	1.65	.93	1.88	1.03	**.229**	**.025**	1.94	.97	1.90	.97	.041	.362

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3888.407) = 1.490, p = .215

2.3.3. Aspirations towards science/chemistry: university studying

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I intend to continue to study science at university

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Aspirations towards science/chemistry: university studying

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.38	.87	2.60	.88	**.244**	**.028**	2.46	.91	2.42	.90	.050	.414
Year 8	2.50	1.00	2.48	.92	.028	.797	2.47	.89	2.53	.92	.070	.166
Year 9	2.21	.92	2.48	.93	**.290**	**<.001**	2.39	.93	2.34	.91	.063	.207
Year 10	1.70	.70	1.85	.81	.198	.067	2.00	.81	2.01	.89	.006	.905
Year 11	1.46	.64	1.74	.88	**.361**	**.002**	1.83	.83	1.81	.87	.023	.711

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2324.929) = 2.215, p = .065

Older cohort only: Aspirations towards science/chemistry: university studying

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.43	.96	2.36	.95	.073	.600	2.53	.93	2.49	.91	.043	.469
Year 9	2.30	.99	2.14	.89	.169	.158	2.43	.93	2.31	.89	**.128**	**.015**
Year 10	1.78	.72	1.84	.79	.076	.398	1.97	.80	1.91	.78	.079	.142
Year 11	1.48	.75	1.33	.58	.239	.317	1.70	.76	1.68	.80	.030	.645

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1809.731) = 1.044, p = .372

Both cohorts combined: Aspirations towards science/chemistry: university studying

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.48	.98	2.43	.93	.047	.587	2.49	.91	2.51	.92	.021	.579
Year 9	2.24	.94	2.37	.93	**.143**	**.030**	2.41	.93	2.32	.90	**.094**	**.009**
Year 10	1.75	.71	1.84	.80	.128	.064	1.99	.81	1.96	.84	.031	.401
Year 11	1.46	.66	1.63	.83	**.226**	**.028**	1.77	.80	1.75	.84	.026	.565

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3973.602) = 1.970, p = .116

2.3.4. Aspirations towards science/chemistry: careers

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I would like a job that includes science when I grow up

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Aspirations towards science/chemistry: careers

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.32	.90	2.56	.94	**.268**	**.017**	2.32	.93	2.34	.94	.018	.762
Year 8	2.52	.98	2.45	.92	.082	.456	2.40	.93	2.54	.95	**.149**	**.003**
Year 9	2.35	.99	2.61	.93	**.276**	**.001**	2.48	.92	2.46	.92	.021	.671
Year 10	1.72	.76	1.91	.81	**.241**	**.026**	2.08	.86	2.09	.89	.002	.967
Year 11	1.51	.68	1.92	.85	**.536**	**<.001**	1.99	.90	1.95	.92	.042	.502

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2292.885) = 4.222, p = .002

Older cohort only: Aspirations towards science/chemistry: careers

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.42	1.01	2.40	.93	.025	.858	2.49	.95	2.49	.94	.003	.956
Year 9	2.43	1.02	2.29	.88	.145	.223	2.39	.96	2.41	.93	.019	.717
Year 10	2.34	.99	2.42	.93	.076	.401	2.37	.97	2.37	.96	.003	.951
Year 11	1.81	.96	1.50	.75	.379	.114	1.86	.88	1.83	.87	.031	.631

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1705.792) = 1.382, p = .247

Both cohorts combined: Aspirations towards science/chemistry: careers

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.49	.99	2.43	.92	.061	.482	2.44	.94	2.52	.95	**.084**	**.029**
Year 9	2.37	1.00	2.51	.92	**.144**	**.029**	2.43	.94	2.44	.93	.003	.925
Year 10	2.07	.95	2.22	.92	**.156**	**.024**	2.23	.93	2.22	.94	.005	.903
Year 11	1.55	.74	1.81	.85	**.327**	**.002**	1.92	.89	1.89	.89	.036	.413

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3952.806) = 3.344, p = .018

2.3.5. Aspirations towards science careers

Single item (phrased for science at Year 7, Year 8, Year 9, Year 10, Year 11)

- I would like a job that includes science when I grow up

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Aspirations towards science careers

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.32	.90	2.56	.94	**.268**	**.017**	2.32	.93	2.34	.94	.018	.762
Year 8	2.52	.98	2.45	.92	.082	.456	2.40	.93	2.54	.95	**.149**	**.003**
Year 9	2.35	.99	2.61	.93	**.276**	**.001**	2.48	.92	2.46	.92	.021	.671
Year 10	2.18	.98	2.27	.91	.092	.390	2.37	.95	2.38	1.00	.019	.712
Year 11	2.03	1.07	2.43	1.03	**.383**	**.001**	2.27	1.02	2.29	1.03	.021	.730

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2270.763) = 3.824, p = .004

Older cohort only: Aspirations towards science careers

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.42	1.01	2.40	.93	.025	.858	2.49	.95	2.49	.94	.003	.956
Year 9	2.43	1.02	2.29	.88	.145	.223	2.39	.96	2.41	.93	.019	.717
Year 10	2.34	.99	2.42	.93	.076	.401	2.37	.97	2.37	.96	.003	.951
Year 11	2.59	1.08	2.29	1.05	.286	.232	2.27	1.04	2.17	1.02	.099	.122

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1658.886) = 0.904, p = .438

Both cohorts combined: Aspirations towards science careers

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.49	.99	2.43	.92	.061	.482	2.44	.94	2.52	.95	**.084**	**.029**
Year 9	2.37	1.00	2.51	.92	**.144**	**.029**	2.43	.94	2.44	.93	.003	.925
Year 10	2.27	.99	2.36	.92	.090	.193	2.37	.96	2.38	.98	.012	.756
Year 11	2.11	1.09	2.39	1.03	**.264**	**.011**	2.27	1.03	2.23	1.02	.037	.407

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3819.526) = 3.065, p = .027

2.3.6. Perceived utility of science/chemistry

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Making an effort in science is worth it because it will help me in the work that I want to do later on
- Learning science is worthwhile for me because it will improve my chance of getting a job
- I think science is a useful subject
- I think science will help me in the job I want to do in the future
- I will learn many things in science that will help me get a job
- Science is an important subject for me because I need it for what I want to study later on
- People who are good at science get well-paid jobs

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Perceived utility of science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.93	.54	3.03	.65	.162	.141	2.89	.61	2.89	.62	.009	.882
Year 8	3.03	.57	3.01	.61	.047	.667	2.96	.58	3.04	.62	**.126**	**.012**
Year 9	2.87	.67	3.07	.70	**.294**	**<.001**	2.93	.67	2.94	.63	.017	.737
Year 10	2.42	.56	2.50	.59	.137	.203	2.61	.67	2.66	.66	.072	.157
Year 11	2.26	.64	2.52	.70	**.385**	**.001**	2.54	.73	2.53	.70	.013	.830

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2337.661) = 2.508, p = .040

Older cohort only: Perceived utility of science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.93	.80	2.90	.81	.040	.772	2.98	.65	3.00	.64	.026	.650
Year 9	2.94	.61	2.84	.58	.174	.141	2.95	.60	2.93	.63	.026	.609
Year 10	2.49	.62	2.57	.64	.132	.141	2.60	.62	2.60	.66	.003	.958
Year 11	2.47	.71	2.36	.70	.146	.539	2.46	.66	2.50	.65	.061	.339

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1709.379) = 1.699, p = .165

Both cohorts combined: Perceived utility of science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.99	.67	2.96	.69	.046	.593	2.97	.61	3.02	.63	**.082**	**.030**
Year 9	2.89	.65	3.00	.67	**.159**	**.015**	2.94	.63	2.94	.63	.004	.908
Year 10	2.46	.60	2.54	.62	**.138**	**.045**	2.60	.65	2.63	.66	.038	.293
Year 11	2.29	.65	2.48	.70	**.279**	**.006**	2.50	.70	2.52	.68	.021	.629

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3944.605) = 1.696, p = .166

2.3.7. Interest in science/chemistry

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I look forward to my science lessons
- I enjoy doing science
- Science is an interesting subject

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Interest in science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.85	.78	3.16	.68	**.427**	**<.001**	2.78	.76	2.90	.80	**.149**	**.014**
Year 8	2.96	.67	3.03	.72	.101	.355	2.69	.71	2.94	.68	**.356**	**<.001**
Year 9	2.63	.73	2.89	.75	**.349**	**<.001**	2.68	.72	2.80	.71	**.163**	**.001**
Year 10	2.17	.73	2.47	.76	**.405**	**<.001**	2.53	.78	2.62	.77	**.117**	**.024**
Year 11	2.28	.77	2.59	.76	**.394**	**.001**	2.48	.79	2.57	.78	.110	.079

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2245.116) = 3.566, p = .007

Older cohort only: Interest in science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.76	.82	2.82	.91	.068	.618	2.76	.79	2.88	.78	**.154**	**.007**
Year 9	2.70	.67	2.74	.70	.058	.626	2.63	.74	2.77	.71	**.199**	**<.001**
Year 10	2.41	.72	2.58	.77	**.237**	**.009**	2.48	.74	2.58	.75	**.138**	**.009**
Year 11	2.44	.67	2.28	.87	.202	.399	2.55	.73	2.53	.76	.033	.613

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1666.136) = 1.558, p = .198

Both cohorts combined: Interest in science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.88	.74	2.95	.81	.079	.354	2.72	.75	2.91	.73	**.262**	**<.001**
Year 9	2.65	.71	2.84	.74	**.262**	**<.001**	2.65	.73	2.79	.71	**.184**	**<.001**
Year 10	2.30	.73	2.54	.77	**.314**	**<.001**	2.50	.76	2.60	.76	**.128**	**.001**
Year 11	2.31	.76	2.51	.80	**.255**	**.014**	2.52	.76	2.55	.77	.043	.341

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3873.926) = 2.499, p = .058

2.3.8. Value of science/chemistry to society

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Advances in science and technology usually improve people's living conditions
- Science is important for helping us to understand the natural world
- I will use science in many ways when I am an adult
- Science is valuable to society

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Value of science/chemistry to society

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.89	.62	3.20	.64	**.487**	**<.001**	2.90	.68	2.93	.75	.039	.548
Year 8	2.99	.58	3.08	.70	.135	.224	2.95	.64	3.13	.65	**.279**	**<.001**
Year 9	2.91	.66	3.14	.64	**.359**	**<.001**	2.99	.62	3.04	.64	.069	.178
Year 10	2.49	.69	2.71	.70	**.320**	**.005**	2.66	.72	2.80	.77	**.190**	**.001**
Year 11	2.57	.70	2.85	.73	**.396**	**.001**	2.73	.75	2.81	.74	.115	.087

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2077.477) = 3.015, p = .017

Older cohort only: Value of science/chemistry to society

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.95	.72	2.89	.85	.071	.618	2.89	.64	3.00	.69	**.163**	**.009**
Year 9	2.97	.59	3.03	.64	.093	.435	2.94	.68	3.01	.67	.100	.060
Year 10	2.55	.66	2.73	.70	**.265**	**.004**	2.69	.67	2.75	.67	.091	.093
Year 11	2.90	.56	2.69	.74	.304	.221	2.71	.66	2.75	.73	.063	.359

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1468.152) = 4.010, p = .007

Both cohorts combined: Value of science/chemistry to society

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.98	.63	3.00	.77	.037	.670	2.92	.64	3.08	.67	**.235**	**<.001**
Year 9	2.93	.64	3.10	.64	**.278**	**<.001**	2.96	.65	3.02	.65	**.088**	**.017**
Year 10	2.53	.67	2.73	.70	**.291**	**<.001**	2.67	.69	2.77	.72	**.141**	**<.001**
Year 11	2.62	.69	2.81	.73	**.266**	**.014**	2.72	.71	2.78	.73	.088	.065

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3439.736) = 3.531, p = .014

2.3.9. Self-confidence in science/chemistry

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I am good at science
- I do well in science tests
- I don't need help with science
- When I am doing science, I always know what I am doing
- I do better in science than most people in my class
- I'm certain I can figure out how to do the most difficult science tasks in classes
- I am able to learn science quickly

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Self-confidence in science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.44	.57	2.71	.67	**.442**	**<.001**	2.46	.65	2.57	.71	**.168**	**.006**
Year 8	2.38	.60	2.64	.67	**.402**	**<.001**	2.38	.61	2.63	.63	**.408**	**<.001**
Year 9	2.29	.64	2.60	.70	**.461**	**<.001**	2.24	.62	2.46	.65	**.351**	**<.001**
Year 10	1.86	.56	2.22	.63	**.621**	**<.001**	2.10	.64	2.34	.69	**.360**	**<.001**
Year 11	1.93	.60	2.31	.71	**.586**	**<.001**	2.10	.69	2.28	.71	**.261**	**<.001**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2200.027) = 1.436, p = .220

Older cohort only: Self-confidence in science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.43	.59	2.60	.84	.219	.116	2.40	.63	2.63	.69	**.353**	**<.001**
Year 9	2.26	.59	2.43	.66	**.272**	**.022**	2.24	.63	2.51	.65	**.420**	**<.001**
Year 10	2.03	.61	2.28	.65	**.403**	**<.001**	2.07	.61	2.32	.66	**.383**	**<.001**
Year 11	2.14	.55	2.14	.78	.007	.978	2.08	.65	2.29	.72	**.300**	**<.001**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1530.794) = 0.767, p = .513

Both cohorts combined: Self-confidence in science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.40	.60	2.62	.74	**.325**	**<.001**	2.39	.62	2.63	.65	**.384**	**<.001**
Year 9	2.28	.62	2.54	.69	**.399**	**<.001**	2.24	.63	2.48	.65	**.382**	**<.001**
Year 10	1.95	.59	2.26	.64	**.494**	**<.001**	2.09	.62	2.33	.67	**.372**	**<.001**
Year 11	1.96	.60	2.27	.73	**.459**	**<.001**	2.09	.67	2.28	.71	**.280**	**<.001**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3601.731) = 0.547, p = .650

2.3.10. Teaching and learning experiences: interaction/debate/discussion

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I am given the opportunity to explain my ideas
- The lessons involve all students' opinions about the topics
- I am involved in class debate or discussion

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Teaching and learning experiences: interaction/debate/discussion

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.81	.58	2.98	.62	**.275**	**.014**	2.92	.65	2.91	.67	.016	.797
Year 8	2.92	.59	2.88	.69	.058	.599	2.71	.63	2.84	.64	**.217**	**<.001**
Year 9	2.52	.67	2.70	.73	**.261**	**.001**	2.68	.63	2.72	.68	.053	.281
Year 10	2.40	.66	2.49	.67	.137	.207	2.61	.69	2.65	.68	.070	.178
Year 11	2.36	.67	2.49	.75	.185	.112	2.59	.67	2.68	.70	**.132**	**.035**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2283.126) = 4.084, p = .003

Older cohort only: Teaching and learning experiences: interaction/debate/discussion

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.71	.65	2.82	.88	.149	.279	2.87	.64	2.85	.68	.033	.569
Year 9	2.53	.61	2.72	.60	**.308**	**.010**	2.64	.65	2.73	.63	**.146**	**.005**
Year 10	2.47	.66	2.70	.65	**.355**	**<.001**	2.59	.65	2.63	.64	.065	.219
Year 11	2.50	.58	2.48	.67	.036	.882	2.69	.65	2.64	.66	.065	.318

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1674.198) = 0.998, p = .393

Both cohorts combined: Teaching and learning experiences: interaction/debate/discussion

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.84	.62	2.86	.77	.027	.753	2.78	.64	2.85	.65	**.102**	**.007**
Year 9	2.52	.65	2.71	.69	**.274**	**<.001**	2.66	.64	2.73	.66	**.099**	**.006**
Year 10	2.44	.66	2.62	.66	**.273**	**<.001**	2.60	.67	2.64	.66	.068	.065
Year 11	2.38	.66	2.48	.73	.153	.140	2.63	.66	2.66	.68	.039	.384

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3876.529) = 1.728, p = .159

2.3.11. Teaching and learning experiences: practical/experimental

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I spend time in the lab doing practical experiments
- I am allowed to design my own experiments

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Teaching/learning experiences: practical/experimental

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.45	.59	2.64	.71	**.293**	**.009**	2.41	.72	2.51	.74	**.141**	**.021**
Year 8	2.55	.75	2.48	.83	.084	.446	2.28	.71	2.40	.74	**.165**	**.001**
Year 9	2.26	.71	2.41	.75	**.200**	**.011**	2.19	.69	2.24	.71	.084	.092
Year 10	2.04	.68	2.18	.68	.209	.055	2.21	.67	2.26	.72	.070	.179
Year 11	1.92	.59	2.00	.70	.116	.324	2.24	.71	2.24	.74	.003	.968

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2279.965) = 1.714, p = .144

Older cohort only: Teaching/learning experiences: practical/experimental

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.23	.81	2.44	.81	.256	.064	2.41	.71	2.43	.73	.017	.765
Year 9	2.46	.61	2.62	.62	**.255**	**.032**	2.19	.69	2.29	.71	**.134**	**.010**
Year 10	2.26	.68	2.31	.73	.076	.394	2.20	.64	2.20	.64	.007	.899
Year 11	2.24	.51	2.24	.77	.008	.974	2.18	.66	2.15	.71	.055	.395

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1683.525) = 1.134, p = .334

Both cohorts combined: Teaching/learning experiences: practical/experimental

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.43	.79	2.47	.82	.044	.610	2.34	.71	2.41	.73	**.099**	**.010**
Year 9	2.32	.68	2.48	.72	**.223**	**.001**	2.19	.69	2.26	.71	**.106**	**.003**
Year 10	2.16	.68	2.26	.71	**.140**	**.043**	2.20	.65	2.23	.68	.042	.264
Year 11	1.97	.59	2.06	.73	.131	.208	2.21	.69	2.20	.73	.025	.582

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3866.933) = 0.316, p = .814

2.3.12. Teaching and learning experiences: relevance/applications

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- The teacher uses science to help me understand the world outside school

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Teaching/learning experiences: relevance/applications

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.77	.76	3.00	.81	**.290**	**.010**	2.82	.82	2.80	.89	.019	.760
Year 8	2.99	.73	2.93	.92	.065	.553	2.76	.86	2.87	.89	**.128**	**.011**
Year 9	2.58	.91	2.66	.95	.087	.273	2.69	.87	2.79	.85	**.123**	**.015**
Year 10	2.39	.88	2.38	.89	.012	.911	2.49	.88	2.58	.87	.098	.065
Year 11	2.36	.84	2.55	.86	.216	.068	2.59	.85	2.70	.83	**.131**	**.039**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2295.867) = 2.967, p = .019

Older cohort only: Teaching/learning experiences: relevance/applications

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.57	.94	2.82	1.00	.260	.062	2.74	.85	2.81	.87	.086	.147
Year 9	2.65	.82	2.81	.78	.200	.093	2.64	.86	2.76	.84	**.146**	**.006**
Year 10	2.28	.85	2.47	.91	**.208**	**.022**	2.48	.85	2.54	.85	.072	.176
Year 11	2.56	.75	2.42	1.04	.140	.558	2.66	.81	2.66	.85	.002	.979

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1680.515) = 1.619, p = .183

Both cohorts combined: Teaching/learning experiences: relevance/applications

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.83	.84	2.89	.95	.065	.452	2.75	.86	2.85	.88	**.112**	**.004**
Year 9	2.60	.89	2.71	.90	.121	.065	2.66	.87	2.78	.85	**.137**	**<.001**
Year 10	2.33	.87	2.43	.90	.118	.091	2.49	.86	2.56	.86	**.086**	**.022**
Year 11	2.39	.83	2.51	.91	.139	.187	2.62	.83	2.68	.84	.067	.139

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3944.873) = 0.180, p = .910

2.3.13. Teaching and learning experiences (all)

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I am given the opportunity to explain my ideas
- The lessons involve all students' opinions about the topics
- I am involved in class debate or discussion
- I spend time in the lab doing practical experiments
- I am allowed to design my own experiments
- The teacher uses science to help me understand the world outside school

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Teaching and learning experiences (all)

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.68	.51	2.87	.57	**.354**	**.002**	2.73	.57	2.76	.62	.046	.452
Year 8	2.81	.53	2.76	.63	.079	.471	2.57	.57	2.70	.58	**.218**	**<.001**
Year 9	2.45	.61	2.60	.68	**.236**	**.003**	2.52	.58	2.57	.60	.092	.063
Year 10	2.28	.59	2.36	.59	.145	.180	2.45	.61	2.51	.61	.092	.077
Year 11	2.21	.53	2.34	.65	.216	.064	2.47	.62	2.53	.64	.094	.132

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2237.404) = 3.678, p = .005

Older cohort only: Teaching and learning experiences (all)

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.52	.64	2.69	.79	.230	.096	2.70	.58	2.70	.62	.002	.967
Year 9	2.53	.51	2.70	.52	**.330**	**.006**	2.49	.58	2.59	.57	**.170**	**.001**
Year 10	2.37	.59	2.53	.61	**.273**	**.002**	2.44	.56	2.47	.56	.065	.218
Year 11	2.43	.46	2.37	.63	.101	.672	2.51	.56	2.48	.61	.061	.346

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1652.663) = 1.637, p = .179

Both cohorts combined: Teaching and learning experiences (all)

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.70	.59	2.73	.70	.049	.567	2.63	.58	2.70	.60	**.120**	**.002**
Year 9	2.47	.58	2.63	.63	**.264**	**<.001**	2.50	.58	2.58	.59	**.130**	**<.001**
Year 10	2.33	.59	2.47	.61	**.230**	**.001**	2.45	.59	2.49	.59	**.080**	**.030**
Year 11	2.24	.52	2.35	.65	.173	.096	2.49	.59	2.51	.62	.022	.622

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3818.516) = 0.762, p = .515

2.3.14. Perceptions of teachers

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- I like my science teacher
- My science teacher believes that all students can learn science
- My science teacher is interested in me as a person
- My science teacher treats all students the same regardless of how well they can do science
- My science teacher is good at explaining science

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Perceptions of teachers

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.97	.73	3.22	.60	**.359**	**.002**	3.06	.69	3.11	.71	.067	.271
Year 8	3.25	.69	3.08	.70	**.242**	**.029**	2.83	.69	2.98	.72	**.204**	**<.001**
Year 9	2.77	.78	2.79	.86	.028	.723	2.83	.71	2.88	.73	.062	.218
Year 10	2.64	.77	2.73	.69	.114	.296	2.86	.70	2.89	.75	.034	.514
Year 11	2.70	.75	2.73	.72	.048	.685	2.91	.70	2.96	.71	.065	.307

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2342.479) = 4.726, p = .001

Older cohort only: Perceptions of teachers

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.67	.87	2.80	.94	.145	.293	3.05	.68	3.03	.74	.028	.625
Year 9	2.71	.58	2.79	.65	.136	.255	2.81	.70	2.93	.67	**.174**	**.001**
Year 10	2.86	.73	2.93	.76	.092	.306	2.87	.70	2.92	.65	.078	.143
Year 11	2.96	.68	2.66	.87	.371	.125	3.01	.70	3.05	.67	.052	.425

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1636.976) = 2.248, p = .081

Both cohorts combined: Perceptions of teachers

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	3.03	.81	2.97	.81	.076	.375	2.93	.70	3.00	.73	**.098**	**.010**
Year 9	2.75	.73	2.79	.79	.053	.419	2.82	.70	2.90	.71	**.113**	**.002**
Year 10	2.77	.75	2.85	.74	.112	.106	2.87	.70	2.91	.70	.054	.148
Year 11	2.74	.75	2.71	.76	.033	.755	2.96	.70	3.00	.69	.059	.194

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3866.753) = 0.882, p = .449

2.3.15. Encouragement to study science/chemistry

Single item (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Someone in my family thinks that I should continue with science after my GCSEs

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Encouragement to study science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.54	.96	2.73	.92	.202	.085	2.64	.96	2.46	1.00	**.182**	**.006**
Year 8	2.71	.91	2.77	1.03	.061	.587	2.75	.91	2.71	.98	.038	.461
Year 9	2.55	.99	2.73	.96	**.176**	**.027**	2.78	.93	2.59	.93	**.208**	**<.001**
Year 10	2.27	.98	2.33	.98	.058	.605	2.48	.95	2.39	.98	.098	.076
Year 11	2.15	.97	2.50	1.00	**.356**	**.003**	2.41	.99	2.30	.98	.112	.092

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2052.788) = 1.330, p = .256

Older cohort only: Encouragement to study science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.74	.96	2.66	1.06	.075	.602	2.72	.96	2.67	.95	.046	.452
Year 9	2.72	.92	2.44	.96	**.296**	**.015**	2.70	.95	2.61	.96	.097	.069
Year 10	2.30	.96	2.26	.94	.046	.611	2.38	.92	2.30	.90	.091	.093
Year 11	2.50	.95	1.98	.99	**.533**	**.031**	2.34	.98	2.23	.98	.112	.099

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1553.186) = 1.867, p = .133

Both cohorts combined: Encouragement to study science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.72	.93	2.72	1.04	.006	.943	2.73	.93	2.69	.97	.040	.306
Year 9	2.60	.97	2.64	.97	.036	.591	2.74	.94	2.60	.95	**.151**	**<.001**
Year 10	2.29	.96	2.28	.96	.005	.948	2.43	.94	2.34	.94	**.092**	**.017**
Year 11	2.20	.97	2.36	1.02	.160	.137	2.38	.98	2.27	.98	**.113**	**.016**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3495.212) = 0.465, p = .706

2.3.16. Home support for science/chemistry achievement

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Someone in my family wants me to talk to them about my science work
- Someone in my family wants me to be successful in science
- Someone in my family helps me with science homework/learning at home (via a tutor or personally)

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Home support for science/chemistry achievement

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	2.64	.66	2.74	.74	.129	.267	2.76	.73	2.66	.83	.124	.054
Year 8	2.66	.74	2.65	.77	.011	.919	2.72	.71	2.68	.75	.065	.198
Year 9	2.49	.78	2.58	.81	.116	.144	2.70	.71	2.57	.72	**.188**	**<.001**
Year 10	2.30	.76	2.30	.79	.000	.998	2.43	.79	2.39	.84	.052	.349
Year 11	2.19	.77	2.44	.75	**.333**	**.006**	2.41	.83	2.37	.80	.056	.397

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2141.037) = 1.007, p = .402

Older cohort only: Home support for science/chemistry achievement

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.58	.75	2.58	.87	.003	.981	2.70	.77	2.66	.75	.050	.409
Year 9	2.48	.76	2.50	.72	.017	.889	2.60	.76	2.60	.75	.009	.867
Year 10	2.30	.75	2.34	.78	.050	.581	2.45	.75	2.37	.73	**.111**	**.039**
Year 11	2.41	.88	2.24	.89	.189	.440	2.36	.74	2.23	.81	**.158**	**.020**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1482.056) = 0.693, p = .556

Both cohorts combined: Home support for science/chemistry achievement

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	2.63	.75	2.62	.81	.013	.886	2.71	.74	2.67	.75	.059	.134
Year 9	2.49	.77	2.55	.79	.086	.196	2.65	.73	2.58	.73	**.096**	**.009**
Year 10	2.30	.75	2.32	.79	.032	.653	2.44	.77	2.38	.78	**.081**	**.036**
Year 11	2.23	.79	2.39	.79	.210	.050	2.39	.79	2.30	.81	**.107**	**.024**

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3546.239) = 0.659, p = .577

2.3.17. Extra-curricular engagement with science/chemistry

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Put on TV/radio programmes about science
- Read about science topics in books, science magazines, science articles in newspapers
- Visit websites about science topics
- Attend a science club

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Extra-curricular engagement with science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	1.55	.55	1.80	.73	**.384**	**.001**	1.62	.65	1.72	.72	**.151**	**.020**
Year 8	1.50	.52	1.83	.74	**.516**	**<.001**	1.58	.62	1.75	.72	**.258**	**<.001**
Year 9	1.40	.48	1.74	.75	**.552**	**<.001**	1.56	.59	1.64	.62	**.133**	**.010**
Year 10	1.34	.49	1.50	.60	**.311**	**.006**	1.61	.70	1.65	.70	.067	.240
Year 11	1.47	.50	1.79	.75	**.507**	**<.001**	1.75	.72	1.77	.74	.028	.679

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2040.307) = 0.613, p = .654

Older cohort only: Extra-curricular engagement with science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	1.43	.49	1.65	.70	**.350**	**.016**	1.57	.56	1.65	.72	**.138**	**.025**
Year 9	1.51	.61	1.66	.76	.213	.075	1.53	.58	1.61	.69	**.128**	**.016**
Year 10	1.35	.48	1.60	.70	**.419**	**<.001**	1.50	.57	1.57	.64	**.115**	**.035**
Year 11	1.45	.50	1.67	.70	.349	.162	1.66	.66	1.72	.73	.086	.209

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1474.376) = 0.672, p = .569

Both cohorts combined: Extra-curricular engagement with science/chemistry

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	1.48	.51	1.76	.73	**.444**	**<.001**	1.57	.59	1.71	.72	**.213**	**<.001**
Year 9	1.43	.53	1.71	.75	**.439**	**<.001**	1.54	.59	1.63	.65	**.133**	**<.001**
Year 10	1.35	.48	1.57	.67	**.385**	**<.001**	1.55	.63	1.61	.67	**.093**	**.018**
Year 11	1.46	.50	1.76	.74	**.463**	**<.001**	1.71	.69	1.75	.73	.053	.272

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3454.711) = 0.213, p = .888

2.3.18. Encouragement/shared extra-curricular engagement

Average of multiple items (phrased for science at Year 7, Year 8, Year 9, and chemistry at Year 10, Year 11)

- Do you do any of the above with someone from your family
- Are you encouraged to do any of the above by someone from your family

Observed responses (averages per year; 1-4 scales)

Younger cohort only: Encouragement/shared extra-curricular engagement

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 7	1.89	.84	1.86	.84	.034	.775	1.88	.84	1.86	.93	.021	.746
Year 8	1.77	.78	1.99	.95	**.252**	**.025**	1.78	.81	1.95	.94	**.191**	**<.001**
Year 9	1.59	.75	1.81	.88	**.268**	**.001**	1.70	.75	1.68	.78	.024	.649
Year 10	2.01	.93	2.04	.87	.030	.789	1.98	.87	1.98	.92	.008	.885
Year 11	2.01	.87	2.00	.92	.004	.973	2.00	.84	1.93	.90	.073	.280

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (4.000, 2181.658) = 0.979, p = .418

Older cohort only: Encouragement/shared extra-curricular engagement

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	1.71	.78	1.82	.92	.136	.347	1.78	.83	1.78	.89	.004	.946
Year 9	1.69	.81	1.68	.84	.014	.907	1.74	.79	1.70	.81	.051	.337
Year 10	1.48	.70	1.61	.79	.170	.063	1.60	.72	1.62	.74	.020	.720
Year 11	2.12	.94	2.01	.97	.114	.645	1.96	.87	1.93	.89	.037	.586

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 1488.991) = 0.526, p = .665

Both cohorts combined: Encouragement/shared extra-curricular engagement

Time	Comparison students						Chemistry for All students					
	Girls		Boys		Difference		Girls		Boys		Difference	
	M	SD	M	SD	D	Sig. (p)	M	SD	M	SD	D	Sig. (p)
Year 8	1.74	.78	1.92	.94	**.204**	**.022**	1.78	.82	1.88	.92	**.115**	**.004**
Year 9	1.62	.77	1.77	.87	**.179**	**.007**	1.72	.77	1.69	.79	.039	.290
Year 10	1.71	.85	1.76	.84	.067	.346	1.78	.81	1.79	.85	.014	.724
Year 11	2.03	.88	2.01	.93	.021	.843	1.98	.86	1.93	.89	.056	.245

Notes: The table shows the mean ('M'; the average) and standard deviation ('SD'; the extent of dispersion around the mean), together with the magnitude ('D'; Cohen's D) and significance ('Sig. (p)'; p-values) of the differences across groups.

Repeated measures modelling 'time × programme × gender': F (3.000, 3598.828) = 1.446, p = .227

2.4 Year by year detail: aspiration response categories

2.4.1. Younger cohort

Younger cohort: Aspirations towards science/chemistry: A-Level studying

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: A-Level studying [Year 7]	Comparison students	9.6%	30.1%	41.7%	18.6%	-	-
	Chemistry for All students	10.6%	30.6%	42.7%	16.0%	.031	.701
	- attended at least one optional event	9.5%	30.2%	43.5%	16.7%	.026	.917
	- attended more than one optional event	9.9%	31.6%	39.6%	18.9%	.021	.969
Aspirations towards science/chemistry: A-Level studying [Year 8]	Comparison students	9.3%	26.3%	44.2%	20.3%	-	-
	Chemistry for All students	9.5%	27.8%	42.8%	20.0%	.014	.945
	- attended at least one optional event	5.7%	28.3%	43.8%	22.2%	.070	.225
	- attended more than one optional event	6.2%	27.8%	40.2%	25.8%	.086	.190
Aspirations towards science/chemistry: A-Level studying [Year 9]	Comparison students	16.8%	31.5%	34.8%	16.9%	-	-
	Chemistry for All students	13.9%	36.8%	34.2%	15.1%	.057	.060
	- attended at least one optional event	9.1%	36.4%	36.2%	18.3%	**.115**	**.001**
	- attended more than one optional event	6.5%	33.2%	39.7%	20.6%	**.139**	**<.001**
Aspirations towards science/chemistry: A-Level studying [Year 10]	Comparison students	34.9%	43.1%	15.9%	6.0%	-	-
	Chemistry for All students	25.9%	42.5%	21.5%	10.0%	**.096**	**<.001**
	- attended at least one optional event	19.2%	43.8%	25.6%	11.4%	**.204**	**<.001**
	- attended more than one optional event	18.7%	43.3%	26.0%	12.1%	**.214**	**<.001**
Aspirations towards science/chemistry: A-Level studying [Year 11]	Comparison students	50.3%	31.3%	7.7%	10.6%	-	-
	Chemistry for All students	37.9%	36.3%	13.8%	12.0%	**.116**	**<.001**
	- attended at least one optional event	33.0%	35.6%	15.2%	16.1%	**.192**	**<.001**
	- attended more than one optional event	33.7%	34.2%	15.8%	16.3%	**.190**	**<.001**

Notes: Results from the younger cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Younger cohort: Aspirations towards science/chemistry: university studying

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: university studying [Year 7]	Comparison students	13.2%	37.5%	36.6%	12.7%	-	-
	Chemistry for All students	14.8%	39.8%	31.9%	13.5%	.044	.433
	- attended at least one optional event	12.3%	41.0%	30.6%	16.1%	.076	.245
	- attended more than one optional event	12.3%	40.8%	29.9%	17.1%	.084	.260
Aspirations towards science/chemistry: university studying [Year 8]	Comparison students	15.2%	38.8%	28.2%	17.9%	-	-
	Chemistry for All students	12.7%	40.4%	30.9%	16.0%	.038	.443
	- attended at least one optional event	10.5%	40.8%	30.4%	18.3%	.069	.239
	- attended more than one optional event	11.3%	36.7%	31.0%	21.0%	.070	.374
Aspirations towards science/chemistry: university studying [Year 9]	Comparison students	20.1%	38.7%	28.9%	12.3%	-	-
	Chemistry for All students	17.6%	42.1%	26.9%	13.3%	.041	.287
	- attended at least one optional event	12.5%	40.5%	30.8%	16.2%	**.107**	**.004**
	- attended more than one optional event	10.5%	38.0%	33.3%	18.1%	**.132**	**.001**
Aspirations towards science/chemistry: university studying [Year 10]	Comparison students	39.8%	47.0%	10.2%	3.0%	-	-
	Chemistry for All students	30.5%	45.3%	17.6%	6.6%	**.113**	**<.001**
	- attended at least one optional event	22.2%	52.1%	20.6%	5.0%	**.212**	**<.001**
	- attended more than one optional event	21.4%	52.3%	21.4%	4.9%	**.224**	**<.001**
Aspirations towards science/chemistry: university studying [Year 11]	Comparison students	54.4%	35.1%	6.6%	3.9%	-	-
	Chemistry for All students	41.4%	41.0%	12.0%	5.6%	**.118**	**<.001**
	- attended at least one optional event	34.9%	42.7%	15.4%	7.0%	**.216**	**<.001**
	- attended more than one optional event	35.7%	41.2%	16.6%	6.5%	**.215**	**<.001**

Notes: Results from the younger cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Younger cohort: Aspirations towards science/chemistry: careers

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: careers [Year 7]	Comparison students	14.6%	42.3%	27.1%	16.0%	-	-
	Chemistry for All students	18.9%	43.0%	24.4%	13.7%	.057	.205
	- attended at least one optional event	18.1%	43.4%	21.3%	17.3%	.076	.243
	- attended more than one optional event	18.0%	44.5%	18.5%	19.0%	.103	.114
Aspirations towards science/chemistry: careers [Year 8]	Comparison students	17.4%	31.8%	35.7%	15.0%	-	-
	Chemistry for All students	14.9%	40.0%	27.8%	17.3%	**.082**	**.005**
	- attended at least one optional event	10.9%	40.2%	29.2%	19.7%	**.135**	**.001**
	- attended more than one optional event	9.9%	38.1%	30.5%	21.5%	**.144**	**.004**
Aspirations towards science/chemistry: careers [Year 9]	Comparison students	18.5%	32.2%	33.4%	16.0%	-	-
	Chemistry for All students	15.2%	38.0%	31.8%	15.0%	**.060**	**.042**
	- attended at least one optional event	11.7%	34.5%	34.1%	19.7%	**.099**	**.010**
	- attended more than one optional event	9.0%	30.3%	36.5%	24.2%	**.143**	**<.001**
Aspirations towards science/chemistry: careers [Year 10]	Comparison students	39.3%	45.3%	11.5%	3.8%	-	-
	Chemistry for All students	27.4%	44.3%	20.7%	7.5%	**.131**	**<.001**
	- attended at least one optional event	20.5%	47.0%	23.7%	8.8%	**.243**	**<.001**
	- attended more than one optional event	20.1%	47.5%	22.2%	10.2%	**.249**	**<.001**
Aspirations towards science/chemistry: careers [Year 11]	Comparison students	45.9%	40.9%	8.9%	4.3%	-	-
	Chemistry for All students	35.5%	40.0%	17.0%	7.5%	**.123**	**<.001**
	- attended at least one optional event	29.6%	38.8%	22.0%	9.6%	**.234**	**<.001**
	- attended more than one optional event	30.2%	37.7%	24.1%	8.0%	**.242**	**<.001**

Notes: Results from the younger cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Younger cohort: Aspirations towards science careers

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science careers [Year 7]	Comparison students	14.6%	42.3%	27.1%	16.0%	-	-
	Chemistry for All students	18.9%	43.0%	24.4%	13.7%	.057	.205
	- attended at least one optional event	18.1%	43.4%	21.3%	17.3%	.076	.243
	- attended more than one optional event	18.0%	44.5%	18.5%	19.0%	.103	.114
Aspirations towards science careers [Year 8]	Comparison students	17.4%	31.8%	35.7%	15.0%	-	-
	Chemistry for All students	14.9%	40.0%	27.8%	17.3%	**.082**	**.005**
	- attended at least one optional event	10.9%	40.2%	29.2%	19.7%	**.135**	**.001**
	- attended more than one optional event	9.9%	38.1%	30.5%	21.5%	**.144**	**.004**
Aspirations towards science careers [Year 9]	Comparison students	18.5%	32.2%	33.4%	16.0%	-	-
	Chemistry for All students	15.2%	38.0%	31.8%	15.0%	**.060**	**.042**
	- attended at least one optional event	11.7%	34.5%	34.1%	19.7%	**.099**	**.010**
	- attended more than one optional event	9.0%	30.3%	36.5%	24.2%	**.143**	**<.001**
Aspirations towards science careers [Year 10]	Comparison students	27.2%	34.6%	28.3%	9.9%	-	-
	Chemistry for All students	21.3%	34.3%	29.3%	15.1%	**.073**	**.016**
	- attended at least one optional event	14.0%	38.4%	31.2%	16.4%	**.176**	**<.001**
	- attended more than one optional event	13.3%	34.7%	34.4%	17.5%	**.190**	**<.001**
Aspirations towards science careers [Year 11]	Comparison students	33.4%	24.5%	27.8%	14.2%	-	-
	Chemistry for All students	28.6%	29.4%	28.2%	13.8%	.053	.278
	- attended at least one optional event	22.8%	26.8%	31.1%	19.3%	**.124**	**.018**
	- attended more than one optional event	24.4%	23.4%	33.3%	18.9%	**.111**	**.100**

Notes: Results from the younger cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

2.4.2. Older cohort

Older cohort: Aspirations towards science/chemistry: A-Level studying

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: A-Level studying [Year 8]	Comparison students	15.4%	22.5%	45.4%	16.7%	-	-
	Chemistry for All students	9.8%	28.4%	40.5%	21.3%	**.089**	**.011**
	- attended at least one optional event	8.4%	26.3%	38.4%	26.9%	**.162**	**.002**
	- attended more than one optional event	9.0%	27.1%	35.4%	28.5%	**.175**	**.010**
Aspirations towards science/chemistry: A-Level studying [Year 9]	Comparison students	14.9%	40.8%	29.8%	14.5%	-	-
	Chemistry for All students	14.1%	33.4%	37.1%	15.4%	.066	.052
	- attended at least one optional event	9.9%	31.8%	38.5%	19.9%	**.141**	**.003**
	- attended more than one optional event	9.8%	34.2%	30.4%	25.5%	**.151**	**.013**
Aspirations towards science/chemistry: A-Level studying [Year 10]	Comparison students	30.1%	45.2%	18.7%	6.1%	-	-
	Chemistry for All students	26.5%	45.1%	21.3%	7.1%	.042	.323
	- attended at least one optional event	19.5%	43.8%	27.8%	8.9%	**.151**	**<.001**
	- attended more than one optional event	17.6%	45.1%	26.9%	10.4%	**.151**	**.001**
Aspirations towards science/chemistry: A-Level studying [Year 11]	Comparison students	58.2%	22.8%	7.6%	11.4%	-	-
	Chemistry for All students	45.0%	34.6%	12.3%	8.1%	**.087**	**.043**
	- attended at least one optional event	39.1%	36.8%	13.4%	10.7%	**.167**	**.013**
	- attended more than one optional event	34.3%	38.8%	15.7%	11.2%	**.247**	**.005**

Notes: Results from the older cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Older cohort: Aspirations towards science/chemistry: university studying

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: university studying [Year 8]	Comparison students	17.6%	37.0%	30.4%	15.0%	-	-
	Chemistry for All students	12.9%	40.4%	29.6%	17.1%	.055	.239
	- attended at least one optional event	10.4%	38.4%	31.4%	19.8%	.114	.071
	- attended more than one optional event	11.3%	35.9%	34.5%	18.3%	.096	.333
Aspirations towards science/chemistry: university studying [Year 9]	Comparison students	22.7%	45.5%	18.9%	12.9%	-	-
	Chemistry for All students	17.3%	41.4%	28.4%	12.8%	**.086**	**.005**
	- attended at least one optional event	13.7%	39.3%	29.9%	17.2%	**.167**	**<.001**
	- attended more than one optional event	12.6%	37.7%	28.4%	21.3%	**.191**	**.001**
Aspirations towards science/chemistry: university studying [Year 10]	Comparison students	36.5%	49.2%	10.8%	3.5%	-	-
	Chemistry for All students	30.5%	49.6%	15.7%	4.1%	**.075**	**.013**
	- attended at least one optional event	21.4%	52.4%	20.9%	5.2%	**.194**	**<.001**
	- attended more than one optional event	19.7%	48.6%	24.0%	7.7%	**.220**	**<.001**
Aspirations towards science/chemistry: university studying [Year 11]	Comparison students	68.4%	27.8%	1.3%	2.5%	-	-
	Chemistry for All students	47.3%	39.5%	10.0%	3.2%	**.120**	**.002**
	- attended at least one optional event	43.1%	41.1%	12.2%	3.6%	**.222**	**<.001**
	- attended more than one optional event	35.6%	47.0%	12.1%	5.3%	**.335**	**<.001**

Notes: Results from the older cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Older cohort: Aspirations towards science/chemistry: careers

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: careers [Year 8]	Comparison students	17.0%	39.0%	28.3%	15.7%	-	-
	Chemistry for All students	15.1%	38.2%	29.4%	17.3%	.025	.830
	- attended at least one optional event	12.9%	34.3%	33.6%	19.2%	.091	.215
	- attended more than one optional event	13.7%	36.0%	27.3%	23.0%	.096	.343
Aspirations towards science/chemistry: careers [Year 9]	Comparison students	19.7%	39.1%	27.0%	14.2%	-	-
	Chemistry for All students	18.4%	38.2%	28.9%	14.5%	.019	.895
	- attended at least one optional event	11.8%	36.0%	33.3%	19.0%	**.132**	**.008**
	- attended more than one optional event	9.9%	33.0%	32.4%	24.7%	**.183**	**.001**
Aspirations towards science/chemistry: careers [Year 10]	Comparison students	21.2%	32.9%	32.9%	12.9%	-	-
	Chemistry for All students	20.7%	35.8%	29.5%	14.0%	.037	.434
	- attended at least one optional event	12.3%	30.1%	36.3%	21.3%	**.152**	**<.001**
	- attended more than one optional event	11.3%	29.0%	34.4%	25.3%	**.172**	**<.001**
Aspirations towards science/chemistry: careers [Year 11]	Comparison students	58.2%	26.6%	11.4%	3.8%	-	-
	Chemistry for All students	41.5%	38.4%	14.3%	5.7%	**.089**	**.038**
	- attended at least one optional event	37.5%	38.1%	16.3%	8.1%	**.172**	**.010**
	- attended more than one optional event	32.1%	40.3%	17.2%	10.4%	**.262**	**.002**

Notes: Results from the older cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Older cohort: Aspirations towards science careers

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science careers [Year 8]	Comparison students	17.0%	39.0%	28.3%	15.7%	-	-
	Chemistry for All students	15.1%	38.2%	29.4%	17.3%	.025	.830
	- attended at least one optional event	12.9%	34.3%	33.6%	19.2%	.091	.215
	- attended more than one optional event	13.7%	36.0%	27.3%	23.0%	.096	.343
Aspirations towards science careers [Year 9]	Comparison students	19.7%	39.1%	27.0%	14.2%	-	-
	Chemistry for All students	18.4%	38.2%	28.9%	14.5%	.019	.895
	- attended at least one optional event	11.8%	36.0%	33.3%	19.0%	**.132**	**.008**
	- attended more than one optional event	9.9%	33.0%	32.4%	24.7%	**.183**	**.001**
Aspirations towards science careers [Year 10]	Comparison students	21.2%	32.9%	32.9%	12.9%	-	-
	Chemistry for All students	20.7%	35.8%	29.5%	14.0%	.037	.434
	- attended at least one optional event	12.3%	30.1%	36.3%	21.3%	**.152**	**<.001**
	- attended more than one optional event	11.3%	29.0%	34.4%	25.3%	**.172**	**<.001**
Aspirations towards science careers [Year 11]	Comparison students	29.1%	17.7%	38.0%	15.2%	-	-
	Chemistry for All students	31.7%	27.6%	27.9%	12.8%	.073	.123
	- attended at least one optional event	26.6%	24.3%	30.8%	18.4%	.083	.445
	- attended more than one optional event	22.6%	21.8%	33.8%	21.8%	.111	.454

Notes: Results from the older cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

2.4.3. Both cohorts

Both cohorts: Aspirations towards science/chemistry: A-Level studying

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: A-Level studying [Year 8]	Comparison students	11.7%	24.7%	44.7%	18.9%	-	-
	Chemistry for All students	9.6%	28.0%	41.8%	20.6%	.041	.132
	- attended at least one optional event	6.7%	27.6%	41.8%	23.9%	**.105**	**.001**
	- attended more than one optional event	7.1%	27.6%	38.7%	26.7%	**.123**	**.002**
Aspirations towards science/chemistry: A-Level studying [Year 9]	Comparison students	16.2%	34.3%	33.3%	16.2%	-	-
	Chemistry for All students	14.0%	35.2%	35.6%	15.3%	.032	.250
	- attended at least one optional event	9.4%	34.4%	37.2%	19.0%	**.105**	**<.001**
	- attended more than one optional event	7.8%	33.6%	36.0%	22.6%	**.130**	**<.001**
Aspirations towards science/chemistry: A-Level studying [Year 10]	Comparison students	32.1%	44.3%	17.5%	6.1%	-	-
	Chemistry for All students	26.2%	43.8%	21.4%	8.6%	**.070**	**<.001**
	- attended at least one optional event	19.3%	43.8%	26.6%	10.3%	**.175**	**<.001**
	- attended more than one optional event	18.3%	43.9%	26.3%	11.5%	**.181**	**<.001**
Aspirations towards science/chemistry: A-Level studying [Year 11]	Comparison students	51.9%	29.6%	7.7%	10.8%	-	-
	Chemistry for All students	41.3%	35.5%	13.1%	10.1%	**.090**	**<.001**
	- attended at least one optional event	35.9%	36.2%	14.4%	13.6%	**.166**	**<.001**
	- attended more than one optional event	33.9%	36.0%	15.8%	14.3%	**.195**	**<.001**

Notes: Results from both cohorts combined; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Both cohorts: Aspirations towards science/chemistry: university studying

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: university studying [Year 8]	Comparison students	16.2%	38.1%	29.1%	16.7%	-	-
	Chemistry for All students	12.8%	40.4%	30.4%	16.5%	.038	.185
	- attended at least one optional event	10.5%	39.9%	30.8%	18.9%	.085	.017
	- attended more than one optional event	11.3%	36.4%	32.1%	20.1%	.082	.084
Aspirations towards science/chemistry: university studying [Year 9]	Comparison students	20.9%	40.8%	25.8%	12.5%	-	-
	Chemistry for All students	17.5%	41.8%	27.6%	13.1%	.038	.126
	- attended at least one optional event	13.0%	40.0%	30.4%	16.6%	**.118**	**<.001**
	- attended more than one optional event	11.3%	37.9%	31.4%	19.4%	**.146**	**<.001**
Aspirations towards science/chemistry: university studying [Year 10]	Comparison students	37.8%	48.3%	10.6%	3.3%	-	-
	Chemistry for All students	30.5%	47.3%	16.7%	5.4%	**.094**	**<.001**
	- attended at least one optional event	21.9%	52.2%	20.8%	5.1%	**.202**	**<.001**
	- attended more than one optional event	20.7%	50.9%	22.4%	6.0%	**.216**	**<.001**
Aspirations towards science/chemistry: university studying [Year 11]	Comparison students	57.3%	33.6%	5.5%	3.6%	-	-
	Chemistry for All students	44.2%	40.2%	11.1%	4.5%	**.104**	**<.001**
	- attended at least one optional event	38.7%	42.0%	13.9%	5.4%	**.197**	**<.001**
	- attended more than one optional event	35.6%	43.5%	14.8%	6.0%	**.237**	**<.001**

Notes: Results from both cohorts combined; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Both cohorts: Aspirations towards science/chemistry: careers

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: careers [Year 8]	Comparison students	17.3%	34.7%	32.7%	15.3%	-	-
	Chemistry for All students	14.9%	39.3%	28.5%	17.3%	**.049**	**.046**
	- attended at least one optional event	11.6%	38.0%	30.8%	19.5%	**.094**	**.005**
	- attended more than one optional event	11.1%	37.4%	29.5%	22.0%	**.118**	**.003**
Aspirations towards science/chemistry: careers [Year 9]	Comparison students	18.8%	34.3%	31.4%	15.4%	-	-
	Chemistry for All students	16.7%	38.1%	30.4%	14.8%	.036	.160
	- attended at least one optional event	11.7%	35.1%	33.7%	19.4%	**.105**	**<.001**
	- attended more than one optional event	9.4%	31.4%	34.9%	24.4%	**.154**	**<.001**
Aspirations towards science/chemistry: careers [Year 10]	Comparison students	28.7%	38.1%	24.0%	9.2%	-	-
	Chemistry for All students	24.2%	40.2%	24.9%	10.6%	**.045**	**.048**
	- attended at least one optional event	16.8%	39.4%	29.4%	14.5%	**.156**	**<.001**
	- attended more than one optional event	16.6%	40.2%	27.0%	16.2%	**.156**	**<.001**
Aspirations towards science/chemistry: careers [Year 11]	Comparison students	48.4%	38.0%	9.4%	4.2%	-	-
	Chemistry for All students	38.4%	39.2%	15.7%	6.6%	**.090**	**<.001**
	- attended at least one optional event	33.3%	38.5%	19.3%	8.9%	**.189**	**<.001**
	- attended more than one optional event	30.9%	38.7%	21.3%	9.0%	**.227**	**<.001**

Notes: Results from both cohorts combined; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Both cohorts: Aspirations towards science careers

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science careers [Year 8]	Comparison students	17.3%	34.7%	32.7%	15.3%	-	-
	Chemistry for All students	14.9%	39.3%	28.5%	17.3%	**.049**	**.046**
	- attended at least one optional event	11.6%	38.0%	30.8%	19.5%	**.094**	**.005**
	- attended more than one optional event	11.1%	37.4%	29.5%	22.0%	**.118**	**.003**
Aspirations towards science careers [Year 9]	Comparison students	18.8%	34.3%	31.4%	15.4%	-	-
	Chemistry for All students	16.7%	38.1%	30.4%	14.8%	.036	.160
	- attended at least one optional event	11.7%	35.1%	33.7%	19.4%	**.105**	**<.001**
	- attended more than one optional event	9.4%	31.4%	34.9%	24.4%	**.154**	**<.001**
Aspirations towards science careers [Year 10]	Comparison students	23.7%	33.6%	31.0%	11.7%	-	-
	Chemistry for All students	21.0%	35.0%	29.4%	14.6%	.043	.062
	- attended at least one optional event	13.2%	34.7%	33.5%	18.6%	**.153**	**<.001**
	- attended more than one optional event	12.5%	32.5%	34.4%	20.6%	**.166**	**<.001**
Aspirations towards science careers [Year 11]	Comparison students	32.5%	23.1%	29.9%	14.4%	-	-
	Chemistry for All students	30.1%	28.6%	28.0%	13.3%	.044	.189
	- attended at least one optional event	24.5%	25.6%	31.0%	18.9%	**.094**	**.029**
	- attended more than one optional event	23.7%	22.8%	33.5%	20.1%	**.112**	**.029**

Notes: Results from both cohorts combined; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

2.5 Year by year detail: aspiration response categories by gender

2.5.1. Younger cohort

Younger cohort: Aspirations towards science/chemistry: A-Level studying

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: A-Level studying [Year 7]	Girls: Comparison students	11.0%	33.7%	40.7%	14.5%	-	-
	Girls: Chemistry for All students	10.4%	30.1%	42.9%	16.6%	.039	.775
	Boys: Comparison students	9.0%	23.9%	44.5%	22.6%	-	-
	Boys: Chemistry for All students	10.8%	31.1%	42.8%	15.3%	.096	.093
Aspirations towards science/chemistry: A-Level studying [Year 8]	Girls: Comparison students	7.8%	27.1%	43.4%	21.7%	-	-
	Girls: Chemistry for All students	9.6%	27.4%	45.1%	18.0%	.041	.669
	Boys: Comparison students	10.7%	25.0%	45.2%	19.0%	-	-
	Boys: Chemistry for All students	9.3%	28.1%	41.0%	21.6%	.043	.615
Aspirations towards science/chemistry: A-Level studying [Year 9]	Girls: Comparison students	20.8%	33.2%	31.5%	14.5%	-	-
	Girls: Chemistry for All students	13.1%	36.5%	34.0%	16.4%	**.099**	**.015**
	Boys: Comparison students	12.0%	28.8%	39.2%	20.1%	-	-
	Boys: Chemistry for All students	14.1%	37.4%	34.4%	14.0%	**.102**	**.006**
Aspirations towards science/chemistry: A-Level studying [Year 10]	Girls: Comparison students	34.5%	47.0%	12.0%	6.5%	-	-
	Girls: Chemistry for All students	25.4%	44.3%	20.9%	9.5%	**.122**	**.005**
	Boys: Comparison students	34.0%	38.6%	21.6%	5.9%	-	-
	Boys: Chemistry for All students	25.7%	42.1%	22.0%	10.2%	.078	.103
Aspirations towards science/chemistry: A-Level studying [Year 11]	Girls: Comparison students	60.0%	27.7%	3.9%	8.4%	-	-
	Girls: Chemistry for All students	37.4%	36.1%	12.9%	13.6%	**.204**	**<.001**
	Boys: Comparison students	40.6%	34.8%	11.6%	12.9%	-	-
	Boys: Chemistry for All students	37.7%	36.9%	14.9%	10.4%	.054	.578

Notes: Results from the younger cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Younger cohort: Aspirations towards science/chemistry: university studying

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: university studying [Year 7]	Girls: Comparison students	14.0%	45.3%	29.1%	11.6%	-	-
	Girls: Chemistry for All students	14.4%	39.6%	31.5%	14.5%	.054	.547
	Boys: Comparison students	13.0%	27.9%	45.5%	13.6%	-	-
	Boys: Chemistry for All students	15.4%	39.8%	32.3%	12.4%	**.127**	**.012**
Aspirations towards science/chemistry: university studying [Year 8]	Girls: Comparison students	15.3%	40.5%	22.7%	21.5%	-	-
	Girls: Chemistry for All students	12.8%	41.6%	31.5%	14.0%	**.099**	**.030**
	Boys: Comparison students	15.1%	36.7%	33.7%	14.5%	-	-
	Boys: Chemistry for All students	12.3%	39.6%	30.6%	17.4%	.048	.527
Aspirations towards science/chemistry: university studying [Year 9]	Girls: Comparison students	23.5%	41.9%	24.4%	10.2%	-	-
	Girls: Chemistry for All students	16.5%	42.4%	26.2%	14.9%	**.097**	**.019**
	Boys: Comparison students	16.0%	34.9%	34.2%	15.0%	-	-
	Boys: Chemistry for All students	18.1%	42.3%	27.5%	12.1%	**.086**	**.034**
Aspirations towards science/chemistry: university studying [Year 10]	Girls: Comparison students	41.4%	49.0%	7.6%	2.0%	-	-
	Girls: Chemistry for All students	27.5%	50.1%	16.9%	5.4%	**.162**	**<.001**
	Boys: Comparison students	37.3%	44.4%	14.4%	3.9%	-	-
	Boys: Chemistry for All students	31.9%	42.5%	18.4%	7.2%	.067	.215
Aspirations towards science/chemistry: university studying [Year 11]	Girls: Comparison students	61.2%	32.2%	5.9%	0.7%	-	-
	Girls: Chemistry for All students	39.8%	41.9%	13.6%	4.7%	**.195**	**<.001**
	Boys: Comparison students	47.7%	37.9%	7.2%	7.2%	-	-
	Boys: Chemistry for All students	42.4%	40.4%	10.7%	6.4%	.062	.466

Notes: Results from the younger cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Younger cohort: Aspirations towards science/chemistry: careers

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: careers [Year 7]	Girls: Comparison students	15.3%	51.8%	18.8%	14.1%	-	-
	Girls: Chemistry for All students	19.4%	42.3%	25.1%	13.1%	.092	.109
	Boys: Comparison students	14.6%	31.1%	37.7%	16.6%	-	-
	Boys: Chemistry for All students	18.4%	43.8%	23.5%	14.3%	**.148**	**.002**
Aspirations towards science/chemistry: careers [Year 8]	Girls: Comparison students	17.1%	31.7%	32.9%	18.3%	-	-
	Girls: Chemistry for All students	16.4%	41.2%	28.0%	14.3%	.079	.128
	Boys: Comparison students	17.9%	31.5%	38.7%	11.9%	-	-
	Boys: Chemistry for All students	13.3%	39.0%	27.9%	19.8%	**.121**	**.003**
Aspirations towards science/chemistry: careers [Year 9]	Girls: Comparison students	23.2%	33.1%	29.5%	14.2%	-	-
	Girls: Chemistry for All students	14.2%	39.7%	30.2%	15.9%	**.114**	**.003**
	Boys: Comparison students	12.9%	31.1%	37.9%	18.1%	-	-
	Boys: Chemistry for All students	15.8%	37.1%	32.8%	14.4%	.079	.061
Aspirations towards science/chemistry: careers [Year 10]	Girls: Comparison students	43.0%	46.0%	7.0%	4.0%	-	-
	Girls: Chemistry for All students	25.9%	46.9%	20.2%	7.0%	**.195**	**<.001**
	Boys: Comparison students	34.0%	44.4%	18.3%	3.3%	-	-
	Boys: Chemistry for All students	28.2%	42.8%	21.3%	7.7%	.076	.122
Aspirations towards science/chemistry: careers [Year 11]	Girls: Comparison students	58.7%	33.3%	6.7%	1.3%	-	-
	Girls: Chemistry for All students	33.7%	40.6%	18.7%	6.9%	**.233**	**<.001**
	Boys: Comparison students	33.3%	48.4%	11.1%	7.2%	-	-
	Boys: Chemistry for All students	36.6%	39.7%	15.7%	8.0%	.080	.238

Notes: Results from the younger cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Younger cohort: Aspirations towards science careers

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science careers [Year 7]	Girls: Comparison students	15.3%	51.8%	18.8%	14.1%	-	-
	Girls: Chemistry for All students	19.4%	42.3%	25.1%	13.1%	.092	.109
	Boys: Comparison students	14.6%	31.1%	37.7%	16.6%	-	-
	Boys: Chemistry for All students	18.4%	43.8%	23.5%	14.3%	**.148**	**.002**
Aspirations towards science careers [Year 8]	Girls: Comparison students	17.1%	31.7%	32.9%	18.3%	-	-
	Girls: Chemistry for All students	16.4%	41.2%	28.0%	14.3%	.079	.128
	Boys: Comparison students	17.9%	31.5%	38.7%	11.9%	-	-
	Boys: Chemistry for All students	13.3%	39.0%	27.9%	19.8%	**.121**	**.003**
Aspirations towards science careers [Year 9]	Girls: Comparison students	23.2%	33.1%	29.5%	14.2%	-	-
	Girls: Chemistry for All students	14.2%	39.7%	30.2%	15.9%	**.114**	**.003**
	Boys: Comparison students	12.9%	31.1%	37.9%	18.1%	-	-
	Boys: Chemistry for All students	15.8%	37.1%	32.8%	14.4%	.079	.061
Aspirations towards science careers [Year 10]	Girls: Comparison students	30.0%	32.5%	27.0%	10.5%	-	-
	Girls: Chemistry for All students	19.8%	37.3%	29.3%	13.5%	**.105**	**.023**
	Boys: Comparison students	22.2%	37.9%	30.7%	9.2%	-	-
	Boys: Chemistry for All students	22.2%	33.1%	28.7%	16.0%	.071	.165
Aspirations towards science careers [Year 11]	Girls: Comparison students	42.7%	24.7%	20.0%	12.7%	-	-
	Girls: Chemistry for All students	28.8%	29.0%	29.0%	13.2%	**.129**	**.010**
	Boys: Comparison students	24.3%	24.3%	35.5%	15.8%	-	-
	Boys: Chemistry for All students	27.8%	30.3%	27.4%	14.6%	.084	.193

Notes: Results from the younger cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

2.5.2. Older cohort

Older cohort: Aspirations towards science/chemistry: A-Level studying

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: A-Level studying [Year 8]	Girls: Comparison students	16.2%	22.2%	42.4%	19.2%	-	-
	Girls: Chemistry for All students	8.7%	29.8%	37.8%	23.7%	.105	.052
	Boys: Comparison students	16.8%	25.2%	43.0%	15.0%	-	-
	Boys: Chemistry for All students	10.8%	27.2%	43.2%	18.9%	.074	.295
Aspirations towards science/chemistry: A-Level studying [Year 9]	Girls: Comparison students	12.4%	39.4%	30.7%	17.5%	-	-
	Girls: Chemistry for All students	13.6%	33.3%	36.9%	16.2%	.055	.425
	Boys: Comparison students	16.4%	43.2%	29.5%	11.0%	-	-
	Boys: Chemistry for All students	14.6%	33.4%	37.3%	14.6%	.089	.080
Aspirations towards science/chemistry: A-Level studying [Year 10]	Girls: Comparison students	30.5%	46.9%	17.6%	5.0%	-	-
	Girls: Chemistry for All students	26.3%	45.3%	20.5%	7.9%	.070	.213
	Boys: Comparison students	29.5%	43.2%	20.5%	6.8%	-	-
	Boys: Chemistry for All students	26.7%	45.0%	22.1%	6.2%	.031	.807
Aspirations towards science/chemistry: A-Level studying [Year 11]	Girls: Comparison students	44.4%	29.6%	14.8%	11.1%	-	-
	Girls: Chemistry for All students	42.8%	36.7%	13.3%	7.2%	.042	.816
	Boys: Comparison students	65.4%	19.2%	3.8%	11.5%	-	-
	Boys: Chemistry for All students	47.2%	32.6%	11.5%	8.8%	**.129**	**.032**

Notes: Results from the older cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Older cohort: Aspirations towards science/chemistry: university studying

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: university studying [Year 8]	Girls: Comparison students	18.2%	35.4%	31.3%	15.2%	-	-
	Girls: Chemistry for All students	13.0%	38.8%	30.5%	17.7%	.057	.519
	Boys: Comparison students	18.7%	40.2%	27.1%	14.0%	-	-
	Boys: Chemistry for All students	12.7%	42.2%	28.5%	16.6%	.066	.404
Aspirations towards science/chemistry: university studying [Year 9]	Girls: Comparison students	23.0%	38.5%	23.7%	14.8%	-	-
	Girls: Chemistry for All students	16.5%	39.3%	29.4%	14.8%	.067	.256
	Boys: Comparison students	22.1%	52.4%	14.5%	11.0%	-	-
	Boys: Chemistry for All students	18.0%	43.9%	27.3%	10.8%	**.114**	**.013**
Aspirations towards science/chemistry: university studying [Year 10]	Girls: Comparison students	36.8%	50.6%	10.3%	2.3%	-	-
	Girls: Chemistry for All students	29.1%	49.2%	17.2%	4.4%	**.112**	**.009**
	Boys: Comparison students	36.4%	47.5%	11.9%	4.2%	-	-
	Boys: Chemistry for All students	31.7%	49.8%	14.7%	3.8%	.051	.465
Aspirations towards science/chemistry: university studying [Year 11]	Girls: Comparison students	63.0%	29.6%	3.7%	3.7%	-	-
	Girls: Chemistry for All students	45.9%	40.2%	11.7%	2.2%	.088	.259
	Boys: Comparison students	71.2%	26.9%	.0%	1.9%	-	-
	Boys: Chemistry for All students	48.6%	38.9%	8.2%	4.2%	**.147**	**.010**

Notes: Results from the older cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Older cohort: Aspirations towards science/chemistry: careers

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: careers [Year 8]	Girls: Comparison students	19.2%	38.4%	23.2%	19.2%	-	-
	Girls: Chemistry for All students	14.6%	39.9%	27.1%	18.4%	.050	.635
	Boys: Comparison students	17.1%	39.0%	30.5%	13.3%	-	-
	Boys: Chemistry for All students	15.4%	36.5%	32.0%	16.1%	.035	.841
Aspirations towards science/chemistry: careers [Year 9]	Girls: Comparison students	20.3%	35.5%	25.4%	18.8%	-	-
	Girls: Chemistry for All students	19.2%	37.7%	27.9%	15.1%	.041	.676
	Boys: Comparison students	18.6%	43.4%	28.3%	9.7%	-	-
	Boys: Chemistry for All students	17.4%	38.4%	30.1%	14.1%	.058	.426
Aspirations towards science/chemistry: careers [Year 10]	Girls: Comparison students	24.3%	29.7%	33.2%	12.7%	-	-
	Girls: Chemistry for All students	20.8%	36.0%	28.4%	14.8%	.075	.155
	Boys: Comparison students	17.6%	36.1%	33.2%	13.0%	-	-
	Boys: Chemistry for All students	20.6%	35.0%	30.8%	13.6%	.035	.754
Aspirations towards science/chemistry: careers [Year 11]	Girls: Comparison students	48.1%	29.6%	14.8%	7.4%	-	-
	Girls: Chemistry for All students	41.3%	37.9%	14.8%	6.0%	.040	.841
	Boys: Comparison students	63.5%	25.0%	9.6%	1.9%	-	-
	Boys: Chemistry for All students	42.0%	38.6%	14.0%	5.4%	**.131**	**.029**

Notes: Results from the older cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Older cohort: Aspirations towards science careers

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science careers [Year 8]	Girls: Comparison students	19.2%	38.4%	23.2%	19.2%	-	-
	Girls: Chemistry for All students	14.6%	39.9%	27.1%	18.4%	.050	.635
	Boys: Comparison students	17.1%	39.0%	30.5%	13.3%	-	-
	Boys: Chemistry for All students	15.4%	36.5%	32.0%	16.1%	.035	.841
Aspirations towards science careers [Year 9]	Girls: Comparison students	20.3%	35.5%	25.4%	18.8%	-	-
	Girls: Chemistry for All students	19.2%	37.7%	27.9%	15.1%	.041	.676
	Boys: Comparison students	18.6%	43.4%	28.3%	9.7%	-	-
	Boys: Chemistry for All students	17.4%	38.4%	30.1%	14.1%	.058	.426
Aspirations towards science careers [Year 10]	Girls: Comparison students	24.3%	29.7%	33.2%	12.7%	-	-
	Girls: Chemistry for All students	20.8%	36.0%	28.4%	14.8%	.075	.155
	Boys: Comparison students	17.6%	36.1%	33.2%	13.0%	-	-
	Boys: Chemistry for All students	20.6%	35.0%	30.8%	13.6%	.035	.754
Aspirations towards science careers [Year 11]	Girls: Comparison students	22.2%	18.5%	37.0%	22.2%	-	-
	Girls: Chemistry for All students	30.0%	27.4%	28.4%	14.3%	.076	.387
	Boys: Comparison students	32.7%	17.3%	38.5%	11.5%	-	-
	Boys: Chemistry for All students	33.7%	27.2%	27.8%	11.3%	.082	.308

Notes: Results from the older cohort of students; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

2.5.3. Both cohorts

Both cohorts: Aspirations towards science/chemistry: A-Level studying

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: A-Level studying [Year 8]	Girls: Comparison students	10.9%	25.3%	43.0%	20.8%	-	-
	Girls: Chemistry for All students	9.2%	28.4%	41.9%	20.5%	.031	.661
	Boys: Comparison students	13.1%	25.1%	44.4%	17.5%	-	-
	Boys: Chemistry for All students	9.9%	27.7%	41.9%	20.5%	.050	.243
Aspirations towards science/chemistry: A-Level studying [Year 9]	Girls: Comparison students	18.4%	35.0%	31.2%	15.4%	-	-
	Girls: Chemistry for All students	13.4%	34.8%	35.5%	16.3%	**.065**	**.040**
	Boys: Comparison students	13.4%	33.4%	36.0%	17.1%	-	-
	Boys: Chemistry for All students	14.3%	35.7%	35.7%	14.3%	.036	.446
Aspirations towards science/chemistry: A-Level studying [Year 10]	Girls: Comparison students	32.3%	47.0%	15.2%	5.6%	-	-
	Girls: Chemistry for All students	25.8%	44.8%	20.7%	8.7%	**.092**	**.002**
	Boys: Comparison students	31.3%	41.3%	20.9%	6.5%	-	-
	Boys: Chemistry for All students	26.2%	43.4%	22.1%	8.3%	.049	.182
Aspirations towards science/chemistry: A-Level studying [Year 11]	Girls: Comparison students	57.7%	28.0%	5.5%	8.8%	-	-
	Girls: Chemistry for All students	40.0%	36.4%	13.1%	10.6%	**.136**	**<.001**
	Boys: Comparison students	46.9%	30.9%	9.7%	12.6%	-	-
	Boys: Chemistry for All students	42.3%	34.8%	13.3%	9.6%	.063	.187

Notes: Results from both cohorts combined; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Both cohorts: Aspirations towards science/chemistry: university studying

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: university studying [Year 8]	Girls: Comparison students	16.4%	38.5%	26.0%	19.1%	-	-
	Girls: Chemistry for All students	12.9%	40.4%	31.1%	15.7%	.059	.128
	Boys: Comparison students	16.5%	38.1%	31.1%	14.3%	-	-
	Boys: Chemistry for All students	12.5%	40.7%	29.8%	17.1%	.052	.224
Aspirations towards science/chemistry: university studying [Year 9]	Girls: Comparison students	23.3%	40.9%	24.2%	11.6%	-	-
	Girls: Chemistry for All students	16.5%	40.8%	27.8%	14.8%	**.083**	**.003**
	Boys: Comparison students	17.9%	40.5%	27.9%	13.7%	-	-
	Boys: Chemistry for All students	18.0%	43.0%	27.4%	11.5%	.032	.572
Aspirations towards science/chemistry: university studying [Year 10]	Girls: Comparison students	38.8%	49.9%	9.2%	2.2%	-	-
	Girls: Chemistry for All students	28.3%	49.7%	17.1%	5.0%	**.135**	**<.001**
	Boys: Comparison students	36.8%	46.3%	12.9%	4.1%	-	-
	Boys: Chemistry for All students	31.8%	46.0%	16.6%	5.6%	.057	.090
Aspirations towards science/chemistry: university studying [Year 11]	Girls: Comparison students	61.5%	31.8%	5.6%	1.1%	-	-
	Girls: Chemistry for All students	42.7%	41.1%	12.7%	3.5%	**.142**	**<.001**
	Boys: Comparison students	53.7%	35.1%	5.4%	5.9%	-	-
	Boys: Chemistry for All students	45.4%	39.7%	9.5%	5.4%	.076	.078

Notes: Results from both cohorts combined; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Both cohorts: Aspirations towards science/chemistry: careers

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science/chemistry: careers [Year 8]	Girls: Comparison students	17.9%	34.2%	29.3%	18.6%	-	-
	Girls: Chemistry for All students	15.7%	40.7%	27.6%	16.1%	.050	.256
	Boys: Comparison students	17.6%	34.4%	35.5%	12.5%	-	-
	Boys: Chemistry for All students	14.2%	38.0%	29.6%	18.3%	**.077**	**.022**
Aspirations towards science/chemistry: careers [Year 9]	Girls: Comparison students	22.3%	33.8%	28.3%	15.5%	-	-
	Girls: Chemistry for All students	16.8%	38.7%	29.1%	15.5%	**.066**	**.038**
	Boys: Comparison students	14.8%	35.0%	34.8%	15.4%	-	-
	Boys: Chemistry for All students	16.5%	37.7%	31.6%	14.3%	.037	.428
Aspirations towards science/chemistry: careers [Year 10]	Girls: Comparison students	32.5%	36.8%	21.8%	8.9%	-	-
	Girls: Chemistry for All students	23.3%	41.5%	24.2%	10.9%	**.092**	**.002**
	Boys: Comparison students	24.0%	39.4%	27.4%	9.2%	-	-
	Boys: Chemistry for All students	24.6%	39.1%	25.8%	10.5%	.021	.839
Aspirations towards science/chemistry: careers [Year 11]	Girls: Comparison students	57.1%	32.8%	7.9%	2.3%	-	-
	Girls: Chemistry for All students	37.4%	39.3%	16.8%	6.5%	**.154**	**<.001**
	Boys: Comparison students	41.0%	42.4%	10.7%	5.9%	-	-
	Boys: Chemistry for All students	39.2%	39.2%	14.8%	6.8%	.049	.417

Notes: Results from both cohorts combined; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

Both cohorts: Aspirations towards science careers

Indicator	Category of students	Responses				Difference to comparison students	
		Strongly Disagree	Disagree	Agree	Strongly Agree	V	Sig. (p)
Aspirations towards science careers [Year 8]	Girls: Comparison students	17.9%	34.2%	29.3%	18.6%	-	-
	Girls: Chemistry for All students	15.7%	40.7%	27.6%	16.1%	.050	.256
	Boys: Comparison students	17.6%	34.4%	35.5%	12.5%	-	-
	Boys: Chemistry for All students	14.2%	38.0%	29.6%	18.3%	**.077**	**.022**
Aspirations towards science careers [Year 9]	Girls: Comparison students	22.3%	33.8%	28.3%	15.5%	-	-
	Girls: Chemistry for All students	16.8%	38.7%	29.1%	15.5%	**.066**	**.038**
	Boys: Comparison students	14.8%	35.0%	34.8%	15.4%	-	-
	Boys: Chemistry for All students	16.5%	37.7%	31.6%	14.3%	.037	.428
Aspirations towards science careers [Year 10]	Girls: Comparison students	26.8%	30.9%	30.5%	11.8%	-	-
	Girls: Chemistry for All students	20.3%	36.7%	28.8%	14.2%	**.080**	**.010**
	Boys: Comparison students	19.4%	36.8%	32.2%	11.5%	-	-
	Boys: Chemistry for All students	21.4%	34.0%	29.7%	14.8%	.047	.220
Aspirations towards science careers [Year 11]	Girls: Comparison students	39.5%	23.7%	22.6%	14.1%	-	-
	Girls: Chemistry for All students	29.4%	28.2%	28.7%	13.7%	**.082**	**.042**
	Boys: Comparison students	26.5%	22.5%	36.3%	14.7%	-	-
	Boys: Chemistry for All students	30.6%	28.8%	27.6%	13.0%	**.082**	**.044**

Notes: Results from both cohorts combined; the table shows the percentage per response category per questionnaire item. The magnitude ('V'; Cramer's V) and significance ('Sig. (p)'; p-values) of the differences between the comparison students and the Chemistry for All students are also shown.

3. Students' likes and dislikes about science/chemistry

3.1 What things do you like about science/chemistry at your school

3.1.1. Younger cohort

Considering the younger cohort of students across Year 7, Year 8, Year 9, Year 10, and Year 11, encompassing students within schools that received the Chemistry for All programme and students within other schools, the most prevalent themes for 'What things do you like about science/chemistry at your school' were the following.

- Experimental and/or practical work (5088 instances across Year 7, Year 8, Year 9, Year 10, and Year 11; 62.6% of all responses).
- Mentioning particular science topics (across all science subjects; 1143 instances; 14.1%).
- Fun, enjoyment, and/or interest (1107 instances; 13.6%).
- Teachers being good, beneficial, and/or positively perceived (across all aspects linked with teachers, including teachers facilitating understanding and enjoyment; 688 instances; 8.5%).
- Learning new things (409 instances; 5.0%).
- Learning many things and/or a variety of things (195 instances; 2.4%).
- Learning about relevant things (172 instances; 2.1%). This category included learning about the world and/or how things work.
- Everything and/or that science/chemistry was generally perceived positively without further detail being provided (171 instances; 2.1%). This category encompassed students literally expressing 'everything', that science/chemistry was 'good', and other equivalent views.
- Groupwork within teaching/learning (134 instances; 1.6%).
- Utility of science/chemistry and any wider benefits from learning/careers (114 instances; 1.4%).

However, some students highlighted (via this question) that nothing was liked and/or that science/chemistry was perceived negatively (730 instances across Year 7, Year 8, Year 9, Year 10, and Year 11; 9.0% of all responses).

Younger cohort: What things do you like about science/chemistry at your school?

Category/theme	All students (Comparison students and Chemistry for All students)				
	Year 7	Year 8	Year 9	Year 10	Year 11
Experimental/practical work	68.6%	71.8%	59.2%	58.8%	51.4%
Mentioning science topics	15.6%	17.4%	15.0%	10.3%	10.4%
Fun, enjoyment, and/or interest	11.2%	18.6%	15.3%	10.4%	10.1%
Teachers	5.1%	7.9%	8.8%	8.5%	12.9%
Learning new things	3.8%	6.1%	8.0%	2.6%	3.1%
Learning many things	2.9%	4.2%	1.8%	1.5%	1.3%
Learning about relevant things	1.1%	2.3%	2.6%	1.9%	2.4%
Everything	2.7%	2.1%	1.0%	2.3%	3.1%
Groupwork	1.7%	2.8%	1.9%	1.0%	.3%
Utility of science/chemistry	.7%	2.6%	1.4%	1.2%	.7%
Nothing (or negative views)	4.0%	3.4%	8.4%	15.1%	16.5%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

Younger cohort: What things do you like about science/chemistry at your school?

Category/theme	Comparison students				
	Year 7	Year 8	Year 9	Year 10	Year 11
Experimental and/or practical work	67.7%	71.9%	59.6%	62.6%	48.7%
Mentioning particular science topics	23.0%	14.5%	12.9%	9.1%	7.9%
Fun, enjoyment, and/or interest	12.5%	23.0%	17.0%	7.9%	10.2%
Teachers	3.8%	10.9%	7.5%	8.2%	15.8%
Learning new things	3.8%	4.8%	6.5%	1.8%	3.8%
Learning many things	3.8%	4.8%	6.5%	1.8%	3.8%
Learning about relevant things	1.5%	2.4%	2.2%	1.2%	2.6%
Everything	3.5%	2.1%	.8%	1.5%	1.5%
Groupwork within teaching/learning	2.0%	4.2%	2.8%	1.8%	.4%
Utility of science/chemistry	.9%	1.2%	2.2%	1.2%	.8%
Nothing (or negative views)	3.2%	1.5%	10.5%	14.3%	17.7%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

Younger cohort: What things do you like about science/chemistry at your school?

Category/theme	Chemistry for All students				
	Year 7	Year 8	Year 9	Year 10	Year 11
Experimental and/or practical work	68.9%	71.8%	59.1%	57.8%	52.3%
Mentioning particular science topics	13.3%	18.0%	15.8%	10.6%	11.1%
Fun, enjoyment, and/or interest	10.8%	17.6%	14.6%	11.0%	10.1%
Teachers	5.5%	7.2%	9.4%	8.6%	12.1%
Learning new things	3.7%	6.3%	8.6%	2.8%	2.9%
Learning many things	3.7%	6.3%	8.6%	2.8%	2.9%
Learning about relevant things	1.0%	2.3%	2.8%	2.1%	2.3%
Everything	2.4%	2.1%	1.1%	2.5%	3.6%
Groupwork within teaching/learning	1.6%	2.5%	1.5%	.8%	.2%
Utility of science/chemistry	.7%	2.8%	1.0%	1.2%	.7%
Nothing (or negative views)	4.3%	3.8%	7.6%	15.3%	16.1%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

3.1.2. Older cohort

Considering the older cohort of students across Year 8, Year 9, Year 10, and Year 11, encompassing students within schools that received the Chemistry for All programme and students within other schools, the most prevalent themes for 'What things do you like about science/chemistry at your school' were the following.

- Experimental and/or practical work (3566 instances across Year 8, Year 9, Year 10, and Year 11; 62.9% of all responses).
- Mentioning particular science topics (across all science subjects; 787 instances; 13.9%).
- Fun, enjoyment, and/or interest (731 instances; 12.9%).
- Teachers being good, beneficial, and/or positively perceived (across all aspects linked with teachers, including teachers facilitating understanding and enjoyment; 450 instances; 7.9%).
- Learning new things (255 instances; 4.5%).
- Learning many things and/or a variety of things (158 instances; 2.8%).
- Learning about relevant things (1222 instances; 2.2%).
- Everything and/or that science/chemistry was generally perceived positively without further detail being provided (110 instances; 1.9%). This category encompassed students literally expressing 'everything', that science/chemistry was 'good', and other equivalent views.
- Investigating and working scientifically (86 instances; 1.5%). This category specifically considered responses such as testing and/or proving different theories, discovering, researching, investigating, and similar aspects. This could, but did not necessarily always, involve students also mentioning practical/experimental work.
- Groupwork within teaching/learning (85 instances; 1.5%).
- Utility of science/chemistry and any wider benefits from learning/careers (85 instances; 1.5%).

However, some students highlighted (via this question) that nothing was liked and/or that science/chemistry was perceived negatively (538 instances across Year 8, Year 9, Year 10, and Year 11; 9.5% of all responses).

Older cohort: What things do you like about science/chemistry at your school?

Category/theme	All students (Comparison students and Chemistry for All students)			
	Year 8	Year 9	Year 10	Year 11
Experimental and/or practical work	68.1%	66.2%	58.9%	56.0%
Mentioning particular science topics	14.5%	16.3%	12.4%	11.0%
Fun, enjoyment, and/or interest	9.4%	15.1%	13.0%	14.0%
Teachers	4.4%	5.6%	11.6%	10.9%
Learning new things	3.9%	5.9%	4.7%	2.4%
Learning many things	2.9%	4.8%	1.5%	1.0%
Learning about relevant things	2.3%	2.6%	1.3%	2.6%
Everything	2.7%	1.6%	1.4%	2.3%
Groupwork within teaching/learning	1.4%	2.7%	.9%	.5%
Utility of science/chemistry	.9%	2.3%	1.2%	1.4%
Nothing (or negative views)	6.2%	6.3%	13.1%	13.9%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

Older cohort: What things do you like about science/chemistry at your school?

Category/theme	Comparison students			
	Year 8	Year 8	Year 8	Year 8
Experimental and/or practical work	59.8%	68.2%	58.0%	58.1%
Mentioning particular science topics	15.5%	15.9%	10.9%	8.1%
Fun, enjoyment, and/or interest	12.3%	16.3%	13.6%	14.5%
Teachers	7.8%	4.9%	15.5%	14.5%
Learning new things	4.6%	3.2%	4.4%	.0%
Learning many things	2.7%	3.9%	1.8%	1.6%
Learning about relevant things	2.3%	3.2%	1.3%	1.6%
Everything	2.7%	1.8%	.9%	1.6%
Groupwork within teaching/learning	.0%	4.6%	.9%	.0%
Utility of science/chemistry	.9%	2.8%	1.3%	.0%
Nothing (or negative views)	7.8%	3.5%	11.4%	11.3%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

Older cohort: What things do you like about science/chemistry at your school?

Category/theme	Chemistry for All students			
	Year 8	Year 8	Year 8	Year 8
Experimental and/or practical work	69.6%	65.8%	59.3%	55.9%
Mentioning particular science topics	14.3%	16.4%	12.9%	11.2%
Fun, enjoyment, and/or interest	8.9%	14.9%	12.8%	13.9%
Teachers	3.8%	5.8%	10.2%	10.6%
Learning new things	3.8%	6.4%	4.9%	2.6%
Learning many things	3.0%	5.0%	1.5%	1.0%
Learning about relevant things	2.3%	2.5%	1.3%	2.7%
Everything	2.7%	1.6%	1.6%	2.3%
Groupwork within teaching/learning	1.7%	2.3%	.9%	.5%
Utility of science/chemistry	.9%	2.2%	1.2%	1.5%
Nothing (or negative views)	5.9%	6.9%	13.7%	14.1%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

3.1.3. Both cohorts

Considering both cohorts of students combined across Year 8, Year 9, Year 10, and Year 11, encompassing students within schools that received the Chemistry for All programme and students within other schools, the most prevalent themes for 'What things do you like about science/chemistry at your school' were the following.

- Experimental and/or practical work (7684 instances across Year 8, Year 9, Year 10, and Year 11; 62.1% of all responses).
- Mentioning particular science topics (across all science subjects; 1709 instances; 13.8%).
- Fun, enjoyment, and/or interest (1680 instances; 13.6%).
- Teachers being good, beneficial, and/or positively perceived (across all aspects linked with teachers, including teachers facilitating understanding and enjoyment; 1066 instances; 8.6%).
- Learning new things (611 instances; 4.9%).
- Learning many things and/or a variety of things (312 instances; 2.5%).
- Learning about relevant things (278 instances; 2.2%).
- Everything and/or that science/chemistry was generally perceived positively without further detail being provided (243 instances; 2.0%). This category encompassed students literally expressing 'everything', that science/chemistry was 'good', and other equivalent views.
- Groupwork within teaching/learning (195 instances; 1.5%).
- Usefulness or utility of science/chemistry and any wider benefits from learning/careers (189 instances; 1.5%).

However, some students highlighted (via this question) that nothing was liked and/or that science/chemistry was perceived negatively (1211 instances across Year 8, Year 9, Year 10, and Year 11; 9.8% of all responses).

Both cohorts: What things do you like about science/chemistry at your school?

Category/theme	All students (Comparison students and Chemistry for All students)			
	Year 8	Year 9	Year 10	Year 11
Experimental and/or practical work	70.2%	62.4%	58.9%	53.4%
Mentioning particular science topics	16.2%	15.6%	11.4%	10.7%
Fun, enjoyment, and/or interest	14.7%	15.2%	11.7%	11.8%
Teachers	6.4%	7.4%	10.1%	12.1%
Learning new things	5.1%	7.0%	3.7%	2.8%
Learning many things	3.6%	3.1%	1.5%	1.2%
Learning about relevant things	2.3%	2.6%	1.6%	2.5%
Everything	2.4%	1.3%	1.9%	2.7%
Groupwork within teaching/learning	2.2%	2.3%	.9%	.3%
Utility of science/chemistry	1.9%	1.8%	1.2%	1.0%
Nothing (or negative views)	4.6%	7.5%	14.1%	15.3%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

Both cohorts: What things do you like about science/chemistry at your school?

Category/theme	Comparison students			
	Year 8	Year 9	Year 10	Year 11
Experimental and/or practical work	67.1%	62.4%	59.9%	50.5%
Mentioning particular science topics	14.9%	13.8%	10.2%	8.0%
Fun, enjoyment, and/or interest	18.7%	16.8%	11.2%	11.0%
Teachers	9.6%	6.7%	12.5%	15.6%
Learning new things	4.7%	5.4%	3.3%	3.1%
Learning many things	3.8%	2.4%	1.7%	1.5%
Learning about relevant things	2.4%	2.5%	1.3%	2.4%
Everything	2.4%	1.1%	1.1%	1.5%
Groupwork within teaching/learning	2.5%	3.4%	1.3%	.3%
Utility of science/chemistry	1.1%	2.4%	1.3%	.6%
Nothing (or negative views)	4.0%	8.3%	12.6%	16.5%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

Both cohorts: What things do you like about science/chemistry at your school?

Category/theme	Chemistry for All students			
	Year 8	Year 9	Year 10	Year 11
Experimental and/or practical work	70.9%	62.4%	58.5%	54.0%
Mentioning particular science topics	16.4%	16.1%	11.7%	11.2%
Fun, enjoyment, and/or interest	13.9%	14.7%	11.9%	12.0%
Teachers	5.7%	7.6%	9.4%	11.4%
Learning new things	5.2%	7.5%	3.8%	2.7%
Learning many things	3.6%	3.4%	1.5%	1.1%
Learning about relevant things	2.3%	2.6%	1.7%	2.5%
Everything	2.4%	1.4%	2.1%	3.0%
Groupwork within teaching/learning	2.1%	1.9%	.8%	.4%
Utility of science/chemistry	2.0%	1.6%	1.2%	1.1%
Nothing (or negative views)	4.7%	7.2%	14.6%	15.1%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

3.2. What things do you not like about science/chemistry at your school

3.2.1. Younger cohort

Considering the younger cohort of students across Year 7, Year 8, Year 9, Year 10, and Year 11, encompassing students within schools that received the Chemistry for All programme and students within other schools, the most prevalent themes for 'What things do you not like about science/chemistry at your school' were the following.

- Writing within teaching/learning (1035 instances across Year 7, Year 8, Year 9, Year 10, and Year 11; 13.8% of all responses).
- Self-confidence related aspects (across any/all aspects; 690 instances; 9.2%). This category encompassed students mainly conveying that science/chemistry was hard, difficult, complex, confusing, and/or hard to understand.
- Boredom, no enjoyment, and/or disinterest (672 instances; 9.0%).
- Teachers being perceived negatively (across any/all aspects related to teachers; 630 instances; 8.4%). This category encompassed perceptions of teachers and/or their teaching in general, teachers being perceived as not providing support, teachers being perceived as not facilitating understanding and/or enjoyment, instances of supply teachers and/or or many changes of teacher, and teachers (not) controlling class behaviour.
- Not doing more experimental and/or practical work (620 instances; 8.3%).
- Mentioning particular science topics (across all science subjects; 607 instances; 8.1%). This category was formed from students mentioning particular topics and/or areas within science.
- Everything and/or that science/chemistry was generally perceived negatively without further detail being provided (601 instances; 8.0%). This category encompassed students literally expressing 'everything', that science/chemistry was 'not good', and other equivalent views.
- Tests, quizzes, and examinations within teaching/learning (560 instances; 7.5%).
- Volume of work within teaching/learning (330 instances; 4.4%).
- Peers being problematic often through disruptive behaviour (329 instances; 4.4%).
- Equations, formulae, and symbols (313 instances; 4.2%).
- Doing experimental and/or practical work (283 instances; 3.8%).
- Textbooks within teaching/learning (236 instances; 3.1%)
- Writing up experiments (142 instances; 1.9%).

However, some students highlighted (within this question) that nothing was disliked and/or that science/chemistry was perceived positively (634 instances across Year 7, Year 8, Year 9, Year 10; 8.5% of all responses).

Younger cohort: What things do you not like about science/chemistry at your school?

Category/theme	All students (Comparison students and Chemistry for All students)				
	Year 7	Year 8	Year 9	Year 10	Year 11
Writing	27.7%	19.6%	9.7%	6.2%	4.1%
Self-confidence related aspects	4.4%	6.5%	8.7%	13.5%	15.1%
Boredom, not fun, disinterest	5.6%	10.0%	9.7%	9.5%	9.2%
Everything	4.9%	5.1%	7.1%	12.6%	12.5%
Mentioning particular science topics	14.0%	12.2%	2.6%	7.5%	4.3%
Teachers	4.7%	9.1%	11.4%	8.6%	6.0%
Not doing more practical work	5.9%	11.3%	11.2%	5.3%	4.6%
Tests, quizzes, and examinations	8.8%	8.3%	8.0%	5.1%	4.5%
Equations, formulae, symbols	.5%	.8%	2.7%	9.6%	10.1%
Volume of work	3.8%	4.6%	4.6%	3.4%	5.9%
Peers being disruptive	4.0%	6.2%	4.5%	3.8%	2.4%
Doing practical work	3.1%	4.0%	4.5%	2.5%	4.7%
Textbooks	4.0%	5.5%	2.8%	1.8%	.6%
Memorisation/remembering	.3%	.9%	1.5%	2.7%	3.0%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

Younger cohort: What things do you not like about science/chemistry at your school?

Category/theme	Comparison students				
	Year 7	Year 8	Year 9	Year 10	Year 11
Writing	24.2%	15.1%	6.3%	6.7%	4.4%
Self-confidence related aspects	4.0%	7.5%	8.0%	19.2%	17.9%
Boredom, not fun, disinterest	5.3%	6.9%	10.5%	11.2%	11.2%
Everything	3.7%	1.6%	7.5%	10.2%	10.0%
Mentioning particular science topics	21.1%	10.5%	3.6%	6.4%	8.0%
Teachers	7.5%	7.9%	14.6%	9.9%	8.0%
Not doing more practical work	5.3%	9.2%	9.5%	6.1%	4.8%
Tests, quizzes, and examinations	6.8%	9.2%	7.1%	3.2%	5.2%
Equations, formulae, symbols	1.2%	1.6%	3.4%	9.9%	6.4%
Volume of work	4.3%	3.0%	3.9%	4.2%	8.0%
Peers being disruptive	3.7%	9.8%	5.0%	4.5%	2.0%
Doing practical work	3.4%	4.3%	5.9%	2.2%	3.6%
Textbooks	7.5%	9.5%	5.4%	2.2%	1.2%
Memorisation/remembering	.3%	1.6%	.5%	3.5%	1.6%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

Younger cohort: What things do you not like about science/chemistry at your school?

Category/theme	Chemistry for All students				
	Year 7	Year 8	Year 9	Year 10	Year 11
Writing	28.8%	20.5%	11.1%	6.1%	4.0%
Self-confidence related aspects	4.5%	6.3%	9.0%	11.9%	14.2%
Boredom, not fun, disinterest	5.7%	10.6%	9.4%	9.1%	8.6%
Everything	5.2%	5.8%	7.0%	13.3%	13.4%
Mentioning particular science topics	11.7%	12.6%	2.2%	7.8%	3.1%
Teachers	3.8%	9.4%	10.1%	8.2%	5.3%
Not doing more practical work	6.1%	11.7%	11.9%	5.1%	4.5%
Tests, quizzes, and examinations	9.4%	8.2%	8.4%	5.6%	4.3%
Equations, formulae, symbols	.2%	.7%	2.4%	9.5%	11.4%
Volume of work	3.6%	5.0%	4.9%	3.2%	5.2%
Peers being disruptive	4.1%	5.4%	4.3%	3.6%	2.5%
Doing practical work	3.0%	4.0%	4.0%	2.5%	5.1%
Textbooks	2.9%	4.6%	1.7%	1.7%	.4%
Memorisation/remembering	.3%	.8%	1.9%	2.4%	3.5%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

3.2.2. Older cohort

Considering the older cohort of students across Year 8, Year 9, Year 10, and Year 11, encompassing students within schools that received the Chemistry for All programme and students within other schools, the most prevalent themes for 'What things do you not like about science/chemistry at your school' were the following.

- Writing within teaching/learning (728 instances across Year 8, Year 9, Year 10, and Year 11; 14.0% of all responses).
- Self-confidence related aspects (across any/all aspects; 551 instances; 10.6%). This category encompassed students mainly conveying that science/chemistry was hard, difficult, complex, confusing, and/or hard to understand.
- Mentioning particular science topics (across all science subjects; 539 instances; 10.3%). This category was formed from students mentioning particular topics and/or areas within science.
- Boredom, no enjoyment, and/or disinterest (521 instances; 10.0%).
- Everything and/or that science/chemistry was generally perceived negatively without further detail being provided (488 instances; 9.4%). This category encompassed students literally expressing 'everything', that science/chemistry was 'not good', and other equivalent views.
- Not doing more experimental and/or practical work (395 instances; 7.6%).
- Teachers being perceived negatively (across any/all aspects related to teachers; 378 instances; 7.2%).
- Tests, quizzes, and examinations within teaching/learning (364 instances; 7.0%).
- Volume of work within teaching/learning (271 instances; 5.2%).
- Equations, formulae, and symbols (246 instances; 4.7%).
- Peers being problematic often through disruptive behaviour (198 instances; 3.8%).
- Textbooks within teaching/learning (187 instances; 3.6%).
- Doing experimental and/or practical work (177 instances; 3.4%).
- Learning having to involve memorisation/remembering (132 instances; 2.5%).

However, some students highlighted (within this question) that nothing was disliked and/or that science/chemistry was perceived positively (396 instances across Year 8, Year 9, Year 10; 7.6% of all responses).

Older cohort only: What things do you not like about science/chemistry at your school?

Category/theme	All students (Comparison students and Chemistry for All students)			
	Year 8	Year 9	Year 10	Year 11
Writing	25.5%	15.7%	7.4%	3.7%
Self-confidence related aspects	4.2%	9.6%	15.5%	13.6%
Boredom, not fun, disinterest	8.3%	11.0%	11.4%	7.9%
Everything	6.8%	7.6%	10.8%	14.3%
Mentioning particular science topics	13.9%	14.6%	2.2%	11.8%
Teachers	5.6%	10.1%	6.5%	5.7%
Not doing more practical work	5.2%	10.8%	7.3%	5.7%
Tests, quizzes, and examinations	9.1%	6.7%	5.5%	6.8%
Equations, formulae, and symbols	.4%	2.9%	7.7%	9.9%
Volume of work	5.8%	6.1%	3.8%	5.0%
Peers being disruptive	3.9%	4.6%	3.5%	2.5%
Doing practical work	3.2%	3.2%	3.5%	3.8%
Textbooks	5.5%	5.3%	1.8%	.4%
Memorisation/remembering	.8%	1.9%	3.8%	4.1%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

Older cohort only: What things do you not like about science/chemistry at your school?

Category/theme	Comparison students			
	Year 8	Year 9	Year 10	Year 11
Writing	12.7%	14.2%	5.6%	3.1%
Self-confidence related aspects	2.9%	7.7%	16.5%	15.4%
Boredom, not fun, disinterest	8.8%	10.4%	12.5%	4.6%
Everything	9.8%	4.6%	9.0%	12.3%
Mentioning particular science topics	14.1%	13.1%	3.0%	3.1%
Teachers	11.7%	11.9%	10.9%	27.7%
Not doing more practical work	7.3%	11.9%	7.0%	4.6%
Tests, quizzes, and examinations	5.4%	6.9%	5.6%	4.6%
Equations, formulae, and symbols	1.0%	4.2%	9.0%	7.7%
Volume of work	3.4%	5.8%	2.1%	7.7%
Peers being disruptive	8.8%	2.7%	5.3%	3.1%
Doing practical work	2.9%	5.0%	3.2%	.0%
Textbooks	12.7%	13.1%	2.8%	.0%
Memorisation/remembering	.0%	1.9%	3.0%	4.6%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

Older cohort only: What things do you not like about science/chemistry at your school?

Category/theme	Chemistry for All students			
	Year 8	Year 9	Year 10	Year 11
Writing	27.8%	16.0%	8.2%	3.7%
Self-confidence related aspects	4.4%	10.0%	15.1%	13.4%
Boredom, not fun, disinterest	8.3%	11.1%	11.0%	8.2%
Everything	6.3%	8.2%	11.5%	14.5%
Mentioning particular science topics	13.8%	14.9%	2.0%	12.7%
Teachers	4.5%	9.7%	4.9%	3.6%
Not doing more practical work	4.8%	10.5%	7.4%	5.8%
Tests, quizzes, and examinations	9.8%	6.7%	5.5%	7.1%
Equations, formulae, and symbols	.3%	2.7%	7.2%	10.1%
Volume of work	6.3%	6.2%	4.4%	4.7%
Peers being disruptive	3.1%	5.0%	2.7%	2.4%
Doing practical work	3.2%	2.9%	3.6%	4.2%
Textbooks	4.1%	3.8%	1.4%	.4%
Memorisation/remembering	1.0%	1.9%	4.2%	4.0%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

3.2.3. Both cohorts

Considering both cohorts of students combined across Year 8, Year 9, Year 10, and Year 11, encompassing students within schools that received the Chemistry for All programme and students within other schools, the most prevalent themes for 'What things do you not like about science/chemistry at your school' were the following.

- Writing within teaching/learning (1398 instances across Year 8, Year 9, Year 10, and Year 11; 12.3% of all responses).
- Self-confidence related aspects (across any/all aspects; 1183 instances; 10.4%). This category encompassed students mainly conveying that science/chemistry was hard, difficult, complex, confusing, and/or hard to understand.
- Boredom, no enjoyment, and/or disinterest (1119 instances; 9.8%).
- Everything and/or that science/chemistry was generally perceived negatively without further detail being provided (1025 instances; 9.0%). This category encompassed students literally expressing 'everything', that science/chemistry was 'not good', and other equivalent views.
- Mentioning particular science topics (across all science subjects; 961 instances; 8.4%). This category was formed from students mentioning particular topics and/or areas within science.
- Teachers being perceived negatively (across any/all aspects related to teachers; 946 instances; 8.3%).
- Not doing more experimental and/or practical work (937 instances; 8.2%).
- Tests, quizzes, and examinations within teaching/learning (787 instances; 6.9%).
- Equations, formulae, and symbols (553 instances; 4.9%).
- Volume of work within teaching/learning (551 instances; 4.8%).
- Peers being problematic often through disruptive behaviour (474 instances; 4.2%).
- Doing experimental and/or practical work (419 instances; 3.7%).
- Textbooks within teaching/learning (370 instances; 3.2%).
- Learning having to involve memorisation/remembering (247 instances; 2.2%).

However, some students highlighted (within this question) that nothing was disliked and/or that science/chemistry was perceived positively (880 instances across Year 8, Year 9, Year 10; 7.7% of all responses).

Both cohorts: What things do you not like about science/chemistry at your school?

Category/theme	All students (Comparison students and Chemistry for All students)			
	Year 8	Year 9	Year 10	Year 11
Writing	22.1%	12.4%	6.9%	3.9%
Self-confidence related aspects	5.5%	9.1%	14.5%	14.4%
Boredom, not fun, disinterest	9.3%	10.3%	10.5%	8.6%
Everything	5.8%	7.3%	11.7%	13.3%
Mentioning particular science topics	12.9%	8.0%	4.8%	7.6%
Teachers	7.6%	10.8%	7.5%	5.9%
Not doing more practical work	8.7%	11.0%	6.4%	5.1%
Tests, quizzes, and examinations	8.7%	7.4%	5.3%	5.5%
Equations, formulae, and symbols	.6%	2.8%	8.6%	10.0%
Volume of work	5.1%	5.3%	3.6%	5.5%
Peers being disruptive	5.2%	4.5%	3.6%	2.4%
Doing practical work	3.7%	3.9%	3.0%	4.3%
Textbooks	5.5%	3.9%	1.8%	.5%
Memorisation/remembering	.9%	1.7%	3.3%	3.5%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

Both cohorts: What things do you not like about science/chemistry at your school?

Category/theme	Comparison students			
	Year 8	Year 9	Year 10	Year 11
Writing	14.1%	8.8%	6.0%	4.1%
Self-confidence related aspects	5.7%	7.9%	17.6%	17.4%
Boredom, not fun, disinterest	7.6%	10.5%	12.0%	9.8%
Everything	4.9%	6.6%	9.5%	10.4%
Mentioning particular science topics	12.0%	6.6%	4.4%	7.0%
Teachers	9.4%	13.8%	10.5%	12.0%
Not doing more practical work	8.4%	10.2%	6.6%	4.7%
Tests, quizzes, and examinations	7.6%	7.1%	4.6%	5.1%
Equations, formulae, and symbols	1.4%	3.7%	9.4%	6.6%
Volume of work	3.1%	4.5%	3.0%	7.9%
Peers being disruptive	9.4%	4.3%	5.0%	2.2%
Doing practical work	3.7%	5.6%	2.8%	2.8%
Textbooks	10.8%	7.8%	2.6%	.9%
Memorisation/remembering	1.0%	1.0%	3.2%	2.2%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.

Both cohorts: What things do you not like about science/chemistry at your school?

Category/theme	Chemistry for All students			
	Year 8	Year 9	Year 10	Year 11
Writing	23.6%	13.5%	7.1%	3.9%
Self-confidence related aspects	5.5%	9.5%	13.5%	13.8%
Boredom, not fun, disinterest	9.6%	10.2%	10.0%	8.4%
Everything	6.0%	7.6%	12.4%	13.9%
Mentioning particular science topics	13.1%	8.5%	4.9%	7.7%
Teachers	7.3%	9.9%	6.5%	4.5%
Not doing more practical work	8.7%	11.2%	6.3%	5.1%
Tests, quizzes, and examinations	8.9%	7.5%	5.5%	5.6%
Equations, formulae, and symbols	.5%	2.5%	8.4%	10.7%
Volume of work	5.5%	5.5%	3.8%	5.0%
Peers being disruptive	4.4%	4.6%	3.2%	2.5%
Doing practical work	3.6%	3.4%	3.1%	4.6%
Textbooks	4.4%	2.7%	1.5%	.4%
Memorisation/remembering	.9%	1.9%	3.3%	3.7%

Notes: The table shows the percentage of provided responses per category/theme. One or more categories may have applied to one response, so the reported percentages may sum to more than 100% per year.