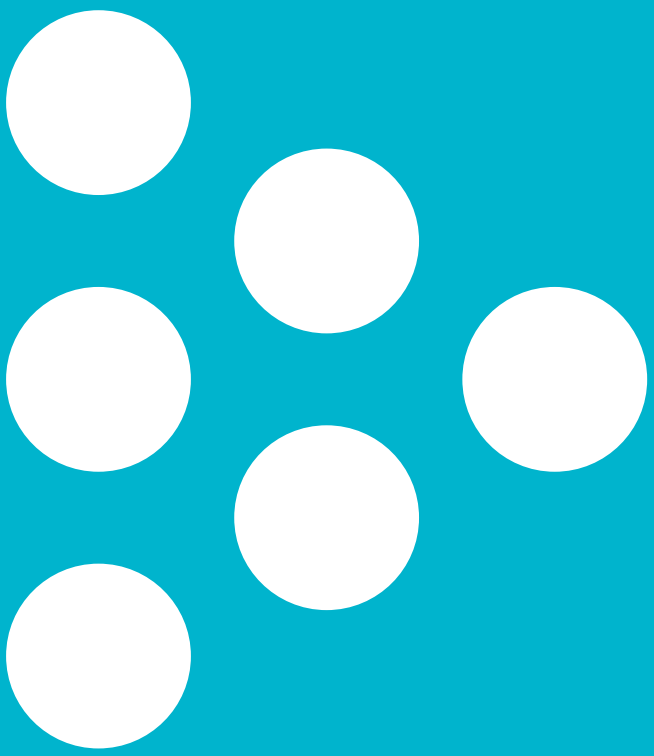
NFER Classroom

Technical Report

Technical information for NFER tests in reading and mathematics Suite 2 (summer)



Technical information for NFER tests in reading and mathematics Suite 2 (summer)

Centre for Assessment

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Contents

1 Introduction

In 2013, NFER produced a suite of reading and mathematics tests for schools to use with years 3, 4 and 5 to help inform teacher assessment. These assessments have been very positively received.

Following the introduction of the new national curriculum in 2014 and the abolition of the eight-level scale of assessment, a new suite of tests has been developed. The design of these tests reflects the changes to the model of assessment used at the end of key stage 2 from 2016.

These tests were standardised with pupils who had been taught the new curriculum for at least a year.

2 Sample characteristics

The NFER tests in reading and mathematics suite 2 were standardised in June 2015 with a sample of schools from across England. The standardisation sample was stratified according to the following characteristics:

- KS2 overall performance band 2013 (average point score)
- Region: government office region

In order to ensure the characteristics of the schools included the standardisation sample were representative nationally, school level characteristics were compared with the national population and chi-square significance tests were conducted. The achieved sample representation across both the above characteristics and these are shown in Table 1 and Table 2. The gender breakdown of the sample is shown in Table 3.

Table 1: Representation of the sample at school level: Years 3, 4 and 5 reading

		Population		Sample	
		Number	%	Number	%
KS2 overall performance band 2013 (average point score)	Lowest 20%	2616	20	7	10
	2nd lowest 20%	2418	18	12	18
	Middle 20%	2639	20	14	21
	2nd highest 20%	2447	19	18	26
	Highest 20%	2957	23	17	25
Total		10377	100	68	100
Government Office Region	North East	747	5	2	3
	North West/Merseyside	2467	16	8	11
	Yorkshire & The Humber	1715	11	10	14
	East Midlands	1512	10	7	9
	West Midlands	1621	10	12	16
	Eastern	1729	11	9	12
	London	1919	12	6	8
	South East	2400	15	11	15
	South West	1804	11	9	12
Total		15914	101	74	100

Since percentages are rounded to the nearest integer, they may not always sum to 100.

Table 2: Representation of the sample at school level: Year 3, 4 and 5 mathematics (A, T1 and T2)

		Population		Sample	
		Number	%	Number	%
KS2 overall performance band 2013 (average point score)	Lowest 20%	2616	20	7	10
	2nd lowest 20%	2418	19	12	18
	Middle 20%	2639	20	13	19
	2nd highest 20%	2447	19	18	27
	Highest 20%	2957	23	17	25
Total		13077	101	67	99
Government Office Region	North East	747	5	2	3
	North West/ Merseyside	2467	16	8	11
	Yorkshire & The Humber	1715	11	9	13
	East Midlands	1512	10	6	8
	West Midlands	1621	10	12	17
	Eastern	1729	11	9	13
	London	1919	12	6	8
	South East	2400	15	11	15
	South West	1804	11	9	13
Total		15914	101	72	101

Since percentages are rounded to the nearest integer, they may not always sum to 100.

Table 3: Representation of the sample at school level: gender

	Population	
	Number	%
Female	2281	49
Male	2370	51

3 Whole test functioning

The following tables provide information on the overall functioning of each test separately by year group.

Table 4: Whole test functioning by test: Year 3

	Year 3 reading	Year 3 mathematics arithmetic paper	Year 3 mathematics Test 1	Year 3 mathematics Test 2
Standardisation sample *n*	1530	1514	1514	1513
Reliability (Cronbach's alpha)	0.916	0.926	0.883	0.879
Maximum score	37	30	25	25
Mean	20.13	14.64	12.02	11.66
Median	21.00	15.00	12.00	11.00
Standard deviation	9.00	8.02	6.24	6.03

Table 5: Whole test functioning by test: Year 4

	Year 4 reading	Year 4 mathematics arithmetic paper	Year 4 mathematics Test 1	Year 4 mathematics Test 2
Standardisation sample *n*	1539	1517	1520	1515
Reliability (Cronbach's alpha)	0.917	0.932	0.890	0.905
Maximum score	40	35	30	30
Mean	19.52	17.6	14.46	14.75
Median	19.00	17.00	14.00	14.00
Standard deviation	9.26	9.22	6.98	7.59

Table 6: Whole test functioning by test: Year 5

	Year 5 reading	Year 5 mathematics arithmetic paper	Year 5 mathematics Test 1	Year 5 mathematics Test 2
Standardisation sample *n*	1584	1529	1535	1530
Reliability (Cronbach's alpha)	0.903	0.942	0.917	0.921
Maximum score	46	40	35	35
Mean	20.2	17.45	15.60	14.89
Median	20	16.00	15.00	14.00
Standard deviation	9.5	10.46	8.52	9.23

4 Item level functioning

Item level statistics

Information about item functioning is available in the analysis spreadsheets. These are downloadable from the NFER portal for purchasers of the tests.

Differential item functioning

Differential item functioning (DIF) analysis, classified separately for gender and EAL, was carried out to identify observed differences in performance on each test. Differential item functioning identifies particular items on which two groups (e.g. girls and boys) perform differently above and beyond the disparity in their achievement on the test as a whole.

The following tables present the outcomes of the DIF analyses, showing the questions where statistical differences between groups have been identified. It is important to note that these statistical differences do not necessarily indicate that a particular question is globally biased towards one group or the other (e.g. gender), but may reflect genuine differences in performance for this sample of pupils.

Table 7: Differential item functioning for gender: reading (Years 3, 4 and 5)

	Question number	DIF favours
Year 3	Q3	Girls**
	Q11	Girls*
	Q13	Girls*
	Q16	Girls**
	Q25	Boys*
	Q27	Boys***
Year 4	Q5	Girls**
	Q7	Girls*
	Q9	Girls*
	Q10	Girls**
	Q13	Boys***
	Q22	Boys*
	Q23b	Boys**
	Q26	Girls*
	Q29	Girls*
Year 5	Q2	Boys*
	Q3	Boys*
	Q5	Boys*
	Q13	Girls*
	Q16a	Girls*
	Q16b	Girls***
	Q18a	Girls***
	Q18b	Girls***
	Q19	Girls***
	Q24	Boys**
	Q25	Boys**
	Q29	Boys*
	Q31	Boys***
	Q32	Boys**
	Q33	Boys***
	Q34	Boys***

*$p < .05$ ** $p < .01$ *** $p < .001$

Table 8: Differential item functioning for gender: mathematics (Years 3, 4 and 5)

	Mathematics TA		Mathematics T1		Mathematics T2	
	Question number	DIF favours	Question number	DIF favours	Question number	DIF favours
Year 3	Q3	Girls*	Q2	Boys*	Q1	Girls**
	Q4	Boys*	Q3	Girls***	Q2	Girls***
	Q8	Girls**	Q4	Girls***	Q5	Girls*
	Q9	Boys***	Q6	Girls***	Q12	Girls***
	Q10	Girls***	Q8	Boys*	Q13	Boys***
	Q13	Boys***	Q12	Girls*	Q14b	Girls***
	Q15	Boys***	Q13	Boys*	Q15	Boys**
	Q19	Boys***	Q15	Boys***	Q18	Boys*
	Q29	Girls**	Q17	Boys*	Q20	Boys***
			Q18	Girls*		
			Q22	Boys**		
Year 4	Q2	Girls*	Q2b	Boys***	Q2	Boys***
	Q3	Boys***	Q3	Girls*	Q3	Girls**
	Q5	Girls**	Q4	Boys***	Q4	Girls***
	Q7	Boys**	Q5	Boys**	Q5	Girls*
	Q8	Girls***	Q7	Girls***	Q7	Girls*
	Q10	Boys*	Q10	Girls*	Q11	Girls***
	Q11	Girls***	Q11	Boys*	Q13	Boys***
	Q14	Boys***	Q14	Girls**	Q15	Boys**
	Q15	Boys*	Q15	Girls**	Q16	Boys***
	Q17	Boys***	Q16	Girls*	Q18	Girls***
	Q18	Girls***	Q19a	Boys**	Q19	Boys*
	Q20	Boys***	Q20	Boys*	Q20	Girls**
	Q21	Girls***	Q23	Boys*	Q22	Boys*
	Q22	Boys*			Q23a	Boys***
	Q26	Girls***			Q23b	Boys***
	Q27	Girls**			Q24	Boys**
	Q28	Boys***				
	Q29	Girls***				
	Q31	Girls*				
	Q32	Girls***				
Year 5	Q1	Girls***	Q1	Girls***	Q1	Girls**
	Q2	Boys***	Q3a	Girls**	Q2	Boys**
	Q3	Boys***	Q5	Boys**	Q4	Boys**
	Q4	Girls***	Q8	Boys*	Q5	Boys**

	Q5	Boys**	Q9	Girls**	Q6	Girls**
	Q6	Boys***	Q11	Girls*	Q13	Girls*
	Q7	Girls**	Q12	Boys**	Q14a	Boys**
	Q8	Girls***	Q13a	Boys*	Q15	Boys***
	Q11	Girls***	Q15	Boys***	Q20	Girls*
	Q13	Boys***	Q18	Boys***	Q22b	Boys*
	Q14	Girls***	Q20	Boys***	Q24	Girls*
	Q16a	Girls**	Q23	Girls**	Q25	Boys**
	Q17	Boys*				
	Q18	Girls***				
	Q19a	Girls**				
	Q21	Girls*				
	Q23	Boys***				
	Q24	Girls*				
	Q25	Boys***				
	Q26	Boys***				
	Q27	Boys*				
	Q29	Boys*				
	Q36	Girls*				

*$p < .05$ ** $p < .01$ *** $p < .001$

Table 9: Differential item functioning for EAL: reading (Years 3, 4 and 5)

	Question number	DIF by EAL	
Year 3	Q10	***	Non-EAL
Year 4	Q1	*	Non-EAL
	Q8	**	Non-EAL
	Q14	**	EAL
	Q16	*	Non-EAL
	Q25	*	Non-EAL
	Q27	*	Non-EAL
	Q28	**	EAL
	Q31	*	EAL
Year 5	Q3	*	Non-EAL
	Q5	*	EAL
	Q6	**	EAL
	Q10	***	EAL
	Q30	*	EAL

*$p < .05$ ** $p < .01$ *** $p < .001$

Table 10: Differential item functioning for EAL: mathematics (Years 3, 4 and 5)

	Mathematics TA		Mathematics T1		Mathematics T2	
	Question number	DIF favours	Question number	DIF favours	Question number	DIF favours
Year 3	Q2 Q3 Q4 Q16 Q21 Q23	Non-EAL* EAL*** Non-EAL* EAL** EAL* Non-EAL*	Q4 Q10	EAL* EAL*	Q5 Q8 Q13 Q18 Q21	EAL* EAL*** Non-EAL* Non-EAL*** Non-EAL*
Year 4	Q3 Q5 Q7 Q10 Q14 Q17 Q20 Q25 Q26 Q27 Q28 Q30 Q32 Q33	Non-EAL** EAL* Non-EAL* Non-EAL* Non-EAL*** Non-EAL** Non-EAL*** Non-EAL*** EAL** EAL** Non-EAL** EAL** EAL*** EAL**	Q2a Q10 Q14 Q16 Q19b	Non-EAL** EAL*** EAL*** Non-EAL* EAL**	Q5 Q9 Q20 Q21 Q24	EAL** Non-EAL** EAL* EAL* EAL*
Year 5	Q3 Q4 Q15 Q17 Q21 Q29 Q31 Q34 Q35	Non-EAL** EAL* Non-EAL*** Non-EAL** EAL* Non-EAL** Non-EAL*** Non-EAL** EAL**	Q1 Q3a Q4a Q12	Non-EAL* EAL* Non-EAL* Non-EAL*		

*$p < .05$ ** $p < .01$ *** $p < .001$

5 Test outcomes

The following outcomes are available from this suite of tests:

Raw score – the total number of marks attained by each pupil

Standardised score

Age standardised score

Attainment in relation to age-related expectations in the 2014 curriculum.

More details of each are available in the relevant teacher guide.

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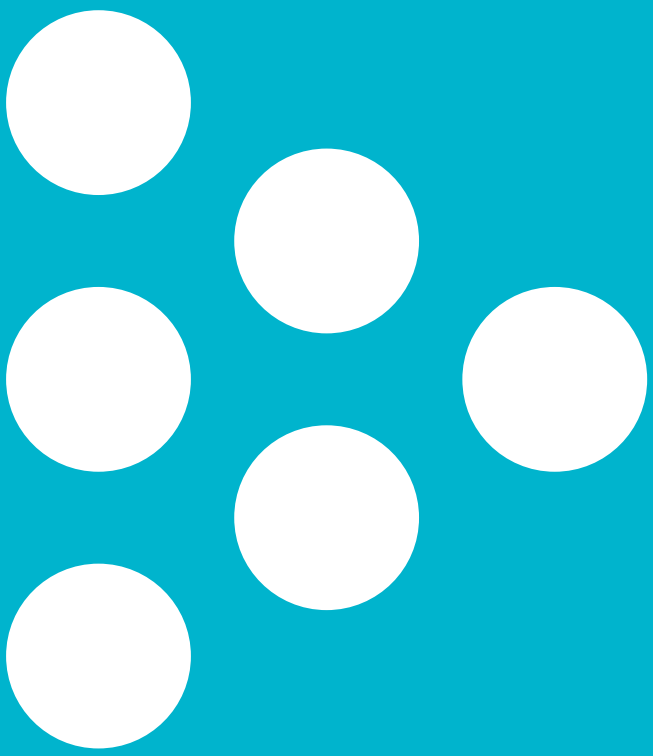

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