

Calculating learners' scores Procedural Numeracy Tests Years 2–9

National Numeracy Tests

2015



Llywodraeth Cymru
Welsh Government

Purpose of this document

The purpose of this booklet is to enable schools to convert raw scores from the tests to age-standardised scores and progress measures where these have not been collected via the Welsh National Tests Data Collection (WNTDC). This will be relevant for independent schools. It will also be relevant where a learner has taken a test outside of the test window or an out-of-year test for diagnostic purposes.

Please note: only progress measures can be calculated for learners taking out-of-year tests.

Calculating learners' scores from national tests

The age-standardised scores and the progress measures were established using the data submitted by all schools in Wales with learners who had taken the 'live' procedural numeracy tests in April/May 2015.

Age-standardised scores

The age-standardised score scales make it possible to compare an individual learner's performance on the test in 2015 with the performance of all other learners of the same age, in years and completed months, taking the test.

Age-standardised scores are adjusted for age.

Working out age at date of test

You can use the 'age calculator' tool at learning.gov.wales/resources/browse-all/reporting-and-interpreting-national-test-results/?lang=en to calculate age at date of test using the learner's date of birth and the date on which the test was taken. This will give you the learner's age in years and completed months.

Working out an age-standardised score

To work out the age-standardised score for an individual learner you will need:

- their raw score (total number of marks awarded when the test was marked)
- their age on the date the test was taken in years and **completed** months.

Use Tables 1–8 to look up the corresponding age-standardised score. Using the appropriate table for the test taken, locate the learner's raw score on the left-hand side of the table. Then read across the row to the column headed by the learner's age. The age-standardised score for this learner is in the cell where the row and column intersect. For example, a learner who has taken test 3EP15/3CG15 and is 8 years and 3 months (8.03) and has a raw score of 18 would have an age-standardised score of 103.

Interpreting an age-standardised score

When age-standardised score scales are developed, the average raw score for all the learners of a given age taking the test is set to be equivalent to a standardised score of 100. About 68 per cent of learners would be expected to have age-standardised scores

between 85 and 115. An age-standardised score lower than 85 **might** suggest some difficulty with procedural numeracy as measured on the test. An age-standardised score greater than 115 **might** suggest that a learner is performing well in comparison with other learners of the same age and that it may be appropriate to provide them with more challenging procedural numeracy activities.

Very low age-standardised scores are shown in the table as * which can be interpreted as 'less than 70' and very high scores are shown as **, which can be interpreted as 'more than 140'. The tests are designed to measure the range of performance in procedural numeracy that would be expected from learners in the specified year groups. In the case of learners whose procedural numeracy skills are developing more slowly than would be expected for their age or learners who achieve very highly on the tests, their scores cannot be determined as accurately as those for learners scoring within the range expected. If a school wishes to calculate class averages, the use of 69 or 141 would be accurate enough estimates for these learners.

Table 1: 2EP15/2CG15 raw score to age-standardised score conversion table

Year 2 Procedural Numeracy 2EP15/2CG15													
Raw score	Age in years and (completed) months												
	6.08	6.09	6.10	6.11	7.00	7.01	7.02	7.03	7.04	7.05	7.06	7.07	7.08
0	*	*	*	*	*	*	*	*	*	*	*	*	*
1	73	73	72	72	71	71	71	70	70	*	*	*	*
2	77	77	77	76	76	75	75	74	74	74	73	73	72
3	80	80	79	79	78	78	77	77	77	76	76	75	75
4	83	83	82	81	81	80	79	79	79	78	78	77	77
5	86	85	84	84	83	82	82	81	80	80	79	79	78
6	88	87	87	86	85	84	84	83	83	82	81	81	80
7	91	90	89	88	87	87	86	85	84	84	83	82	82
8	93	92	91	90	89	89	88	87	86	85	85	84	83
9	95	94	93	92	91	91	90	89	88	87	87	86	85
10	97	96	95	94	93	92	92	91	90	89	88	87	87
11	99	98	97	96	95	94	93	93	92	91	90	89	88
12	101	100	99	98	97	96	95	94	94	93	92	91	90
13	103	102	101	100	99	98	97	96	95	94	94	93	92
14	105	104	103	102	101	100	99	98	97	96	95	94	94
15	107	106	105	104	103	102	101	100	99	98	97	96	95
16	109	108	107	106	105	104	103	102	101	100	99	98	97
17	111	110	109	108	107	106	105	104	103	102	101	100	99
18	113	112	111	110	109	108	107	106	105	104	103	102	101
19	115	114	113	112	111	110	109	108	107	106	105	104	103
20	117	116	115	114	113	112	111	110	109	109	108	107	106
21	119	118	117	116	115	115	114	113	112	111	110	109	108
22	121	120	119	118	118	117	116	115	114	114	113	112	111
23	123	122	122	121	120	119	119	118	117	116	115	115	114

Table 2: 3EP15/3CG15 raw score to age-standardised score conversion table

Year 3 Procedural Numeracy 3EP15/3CG15													
Raw score	Age in years and (completed) months												
	7.08	7.09	7.10	7.11	8.00	8.01	8.02	8.03	8.04	8.05	8.06	8.07	8.08
0	*	*	*	*	*	*	*	*	*	*	*	*	*
1	*	*	*	*	*	*	*	*	*	*	*	*	*
2	75	75	74	74	73	72	72	71	71	70	70	*	*
3	79	78	78	77	77	76	75	75	74	74	73	73	72
4	82	81	81	80	79	79	78	78	77	76	76	75	75
5	85	84	84	83	82	81	81	80	79	79	78	78	77
6	88	87	86	85	84	84	83	82	82	81	80	79	79
7	90	89	88	87	87	86	85	84	84	83	82	81	81
8	92	91	90	89	89	88	87	86	86	85	84	83	83
9	94	93	92	91	91	90	89	88	87	87	86	85	84
10	95	95	94	93	92	92	91	90	89	88	88	87	86
11	97	96	96	95	94	93	92	92	91	90	89	89	88
12	99	98	97	96	96	95	94	93	93	92	91	90	89
13	100	100	99	98	97	96	96	95	94	93	93	92	91
14	102	101	100	100	99	98	97	96	96	95	94	93	93
15	103	103	102	101	100	100	99	98	97	96	96	95	94
16	105	104	103	103	102	101	100	100	99	98	97	96	96
17	106	106	105	104	103	103	102	101	100	100	99	98	97
18	108	107	106	106	105	104	103	103	102	101	100	100	99
19	109	109	108	107	107	106	105	104	103	103	102	101	100
20	111	110	110	109	108	107	107	106	105	104	104	103	102
21	112	112	111	110	110	109	108	108	107	106	105	105	104
22	114	113	113	112	111	111	110	109	109	108	107	106	106
23	116	115	115	114	113	113	112	111	110	110	109	108	108

Table 3: 4EP15/4CG15 raw score to age-standardised score conversion table

Year 4 Procedural Numeracy 4EP15/4CG15													
Raw score	Age in years and (completed) months												
	8.08	8.09	8.10	8.11	9.00	9.01	9.02	9.03	9.04	9.05	9.06	9.07	9.08
0	*	*	*	*	*	*	*	*	*	*	*	*	*
1	*	*	*	*	*	*	*	*	*	*	*	*	*
2	72	71	71	70	70	70	*	*	*	*	*	*	*
3	75	75	75	74	74	73	73	73	72	72	71	71	71
4	78	78	77	77	77	76	76	75	75	75	74	74	73
5	81	80	80	79	79	78	78	78	77	77	76	76	76
6	83	83	82	82	81	80	80	79	79	79	78	78	77
7	85	85	84	84	83	83	82	82	81	80	80	79	79
8	88	87	86	86	85	85	84	84	83	82	82	81	81
9	89	89	88	88	87	87	86	85	85	84	84	83	83
10	91	91	90	90	89	88	88	87	87	86	85	85	84
11	93	92	92	91	91	90	89	89	88	88	87	87	86
12	95	94	94	93	92	92	91	90	90	89	89	88	88
13	96	96	95	95	94	93	93	92	91	91	90	90	89
14	98	97	97	96	96	95	94	94	93	92	92	91	91
15	100	99	98	98	97	96	96	95	95	94	93	93	92
16	101	100	100	99	99	98	97	97	96	95	95	94	94
17	103	102	101	101	100	100	99	98	98	97	96	96	95
18	104	104	103	102	102	101	100	100	99	99	98	97	97
19	106	105	104	104	103	103	102	101	101	100	99	99	98
20	107	107	106	105	105	104	103	103	102	102	101	100	100
21	109	108	107	107	106	106	105	104	104	103	103	102	101
22	110	110	109	108	108	107	107	106	105	105	104	104	103
23	112	111	111	110	109	109	108	108	107	106	106	105	105

Table 4: 5EP15/5CG15 raw score to age-standardised score conversion table

Year 5 Procedural Numeracy 5EP15/5CG15													
Raw score	Age in years and (completed) months												
	9.08	9.09	9.10	9.11	10.00	10.01	10.02	10.03	10.04	10.05	10.06	10.07	10.08
0	*	*	*	*	*	*	*	*	*	*	*	*	*
1	*	*	*	*	*	*	*	*	*	*	*	*	*
2	72	71	71	71	70	70	70	*	*	*	*	*	*
3	76	75	75	75	74	74	74	73	73	72	72	72	71
4	79	78	78	78	77	77	76	76	76	75	75	75	74
5	81	81	80	80	80	79	79	78	78	78	77	77	76
6	84	83	83	83	82	82	81	81	80	80	79	79	78
7	86	86	85	85	84	84	83	83	82	82	81	81	80
8	88	88	87	87	86	86	85	85	84	84	83	83	82
9	90	90	89	89	88	88	87	87	86	86	85	85	84
10	92	92	91	91	90	89	89	88	88	87	87	86	86
11	94	93	93	92	92	91	91	90	90	89	89	88	87
12	96	95	95	94	93	93	92	92	91	91	90	90	89
13	97	97	96	96	95	95	94	93	93	92	92	91	91
14	99	98	98	97	97	96	96	95	95	94	93	93	92
15	100	100	99	99	98	98	97	97	96	96	95	94	94
16	102	101	101	100	100	99	99	98	98	97	97	96	95
17	103	103	102	102	101	101	100	100	99	99	98	98	97
18	105	104	104	103	103	102	102	101	101	100	100	99	98
19	106	106	105	105	104	104	103	103	102	102	101	100	100
20	108	107	107	106	106	105	105	104	104	103	103	102	101
21	109	109	108	108	107	107	106	106	105	105	104	103	103
22	111	110	110	109	109	108	108	107	107	106	106	105	105
23	112	112	111	111	110	110	109	109	108	108	107	107	106

Table 5: 6EP15/6CG15 raw score to age-standardised score conversion table

Year 6 Procedural Numeracy 6EP15/6CG15													
Raw score	Age in years and (completed) months												
	10.08	10.09	10.10	10.11	11.00	11.01	11.02	11.03	11.04	11.05	11.06	11.07	11.08
0	*	*	*	*	*	*	*	*	*	*	*	*	*
1	*	*	*	*	*	*	*	*	*	*	*	*	*
2	*	*	*	*	*	*	*	*	*	*	*	*	*
3	72	71	71	71	70	70	*	*	*	*	*	*	*
4	75	75	75	74	74	73	73	72	72	71	71	71	70
5	78	78	77	77	77	76	76	75	75	74	74	73	73
6	81	80	80	79	79	79	78	78	77	77	76	76	75
7	83	83	82	82	81	81	80	80	79	79	79	78	78
8	85	85	84	84	83	83	82	82	81	81	81	80	80
9	87	87	86	86	85	85	84	84	83	83	82	82	81
10	89	88	88	88	87	87	86	86	85	85	84	84	83
11	91	90	90	89	89	88	88	87	87	86	86	85	85
12	92	92	91	91	90	90	89	89	88	88	87	87	86
13	94	93	93	92	92	91	91	90	90	89	89	88	88
14	95	95	94	94	93	93	92	92	91	91	90	90	89
15	97	96	96	95	95	94	94	93	93	92	92	91	91
16	98	98	97	97	96	96	95	95	94	94	93	93	92
17	100	99	99	98	98	97	97	96	96	95	95	94	94
18	101	101	100	100	99	99	98	98	97	97	96	96	95
19	103	102	102	101	101	100	100	99	99	98	98	97	97
20	104	103	103	103	102	102	101	101	100	100	99	99	98
21	105	105	104	104	103	103	103	102	102	101	101	100	100
22	107	106	106	105	105	104	104	104	103	103	102	102	101
23	108	108	107	107	106	106	105	105	104	104	104	103	103

Table 6: 7EP15/7CG15 raw score to age-standardised score conversion table

Year 7 Procedural Numeracy 7EP15/7CG15													
Raw score	Age in years and (completed) months												
	11.08	11.09	11.10	11.11	12.00	12.01	12.02	12.03	12.04	12.05	12.06	12.07	12.08
0	*	*	*	*	*	*	*	*	*	*	*	*	*
1	78	78	78	78	78	78	78	78	77	77	77	77	77
2	83	83	82	82	82	81	81	80	80	80	79	79	79
3	87	86	86	86	85	85	84	84	84	83	83	83	82
4	90	90	89	89	88	88	88	87	87	86	86	86	85
5	93	92	92	91	91	91	90	90	89	89	89	88	88
6	95	95	94	94	93	93	93	92	92	91	91	90	90
7	97	97	96	96	95	95	95	94	94	93	93	92	92
8	99	99	98	98	97	97	96	96	96	95	95	94	94
9	101	100	100	100	99	99	98	98	97	97	96	96	95
10	103	102	102	101	101	100	100	99	99	98	98	98	97
11	104	104	103	103	102	102	101	101	100	100	100	99	99
12	106	105	105	104	104	103	103	102	102	101	101	101	100
13	107	107	106	106	105	105	104	104	103	103	102	102	101
14	108	108	107	107	107	106	106	105	105	104	104	103	103
15	110	109	109	108	108	107	107	107	106	106	105	105	104
16	111	110	110	110	109	109	108	108	107	107	106	106	106
17	112	112	111	111	110	110	109	109	109	108	108	107	107
18	113	113	112	112	112	111	111	110	110	109	109	109	108
19	114	114	114	113	113	112	112	112	111	111	110	110	109
20	116	115	115	114	114	114	113	113	112	112	111	111	111
21	117	116	116	116	115	115	114	114	114	113	113	112	112
22	118	118	117	117	116	116	116	115	115	114	114	114	113
23	119	119	119	118	118	117	117	116	116	116	115	115	114

Table 7: 8EP15/8CG15 raw score to age-standardised score conversion table

Year 8 Procedural Numeracy 8EP15/8CG15													
Raw score	Age in years and (completed) months												
	12.08	12.09	12.10	12.11	13.00	13.01	13.02	13.03	13.04	13.05	13.06	13.07	13.08
0	*	*	*	*	*	*	*	*	*	*	*	*	*
1	76	76	76	76	75	75	75	75	75	75	74	74	74
2	80	80	80	79	79	79	79	79	78	78	78	78	78
3	84	84	84	83	83	83	83	82	82	82	81	81	81
4	88	88	87	87	87	86	86	85	85	85	84	84	84
5	91	91	90	90	89	89	89	88	88	88	87	87	86
6	94	93	93	92	92	92	91	91	90	90	90	89	89
7	96	96	95	95	94	94	93	93	93	92	92	91	91
8	98	98	97	97	96	96	96	95	95	94	94	94	93
9	100	100	99	99	98	98	98	97	97	96	96	95	95
10	102	102	101	101	100	100	100	99	99	98	98	97	97
11	104	103	103	103	102	102	101	101	100	100	100	99	99
12	106	105	105	104	104	103	103	103	102	102	101	101	100
13	107	107	106	106	105	105	105	104	104	103	103	102	102
14	109	108	108	107	107	107	106	106	105	105	104	104	104
15	110	110	109	109	109	108	108	107	107	106	106	105	105
16	112	111	111	110	110	110	109	109	108	108	107	107	107
17	113	113	112	112	112	111	111	110	110	109	109	108	108
18	115	114	114	113	113	113	112	112	111	111	110	110	110
19	116	116	115	115	114	114	114	113	113	112	112	111	111
20	118	117	117	116	116	115	115	115	114	114	113	113	112
21	119	119	118	118	117	117	116	116	116	115	115	114	114
22	120	120	120	119	119	118	118	117	117	117	116	116	115
23	122	121	121	121	120	120	119	119	119	118	118	117	117

Table 8: 9EP15/9CG15 raw score to age-standardised score conversion table

Year 9 Procedural Numeracy 9EP15/9CG15													
Raw score	Age in years and (completed) months												
	13.08	13.09	13.10	13.11	14.00	14.01	14.02	14.03	14.04	14.05	14.06	14.07	14.08
0	*	*	*	*	*	*	*	*	*	*	*	*	*
1	76	76	76	76	76	75	75	75	75	75	75	75	75
2	79	79	79	79	78	78	78	78	78	78	78	78	77
3	82	82	82	81	81	81	80	80	80	80	79	79	79
4	85	85	85	84	84	84	83	83	83	83	82	82	82
5	88	88	87	87	87	86	86	86	85	85	85	84	84
6	91	90	90	89	89	89	88	88	88	87	87	87	86
7	93	92	92	92	91	91	91	90	90	90	89	89	88
8	95	95	94	94	93	93	93	92	92	92	91	91	90
9	97	96	96	96	95	95	95	94	94	93	93	93	92
10	99	98	98	97	97	97	96	96	96	95	95	94	94
11	101	100	100	99	99	98	98	98	97	97	96	96	96
12	102	102	101	101	101	100	100	99	99	98	98	98	97
13	104	103	103	103	102	102	101	101	101	100	100	99	99
14	106	105	105	104	104	103	103	103	102	102	101	101	100
15	107	107	106	106	105	105	105	104	104	103	103	102	102
16	109	108	108	107	107	107	106	106	105	105	104	104	103
17	110	110	109	109	108	108	108	107	107	106	106	105	105
18	112	111	111	110	110	110	109	109	108	108	107	107	107
19	113	113	112	112	112	111	111	110	110	109	109	109	108
20	115	114	114	114	113	113	112	112	111	111	111	110	110
21	116	116	116	115	115	114	114	113	113	113	112	112	111
22	118	118	117	117	116	116	115	115	115	114	114	113	113
23	120	119	119	118	118	118	117	117	116	116	115	115	115

Progress measures

The progress measure scales are calculated separately for each national curriculum year group and each test.

Progress measures are not adjusted for age.

Working out a progress measure

To work out the progress measure for an individual learner you will need their raw score (total number of marks awarded when the test was marked).

Use Tables 9–16 to look up the corresponding progress measure.

Using the appropriate table for the test taken, locate the learner's raw score on the left-hand side of the table. Then read across the row to the progress measure.

For example, a learner who has taken test 4EP15/4CG15 and has a raw score of 20 would have a progress measure of 1005.

Interpreting a progress measure

The progress measure shows how well an individual learner has done in a given test compared with **all other learners in the same national curriculum year group taking the same test**. The progress measure should be presented as a time series allowing for a learner's achievement in the tests to be tracked over time.

The mean of the progress measure for each year group is set at 1000, and the scores range from 950 to 1050. Learners achieving between 980 and 1020 (i.e. scores within one standard deviation of the mean) have a progress measure that is in line with learners in the same year group (taking the same test). Approximately 68 per cent of learners will have a score in this range. Learners scoring outside of this range (i.e. below 980 or above 1020) have a progress measure that is either below or above that of most learners in their year group.

The progress measure for 2015 should be considered alongside any previous progress measure for this learner. Progress measures that are broadly similar from year to year would suggest that a learner is making steady progress within their year group. Small variations in the score from year to year are to be expected but if there are large changes in the progress measure between one year and the next, then this suggests that a learner has made either more or less progress than the rest of the learners taking the test. Please refer to the practitioner guidance at learning.gov.wales/resources/browse-all/reporting-and-interpreting-national-test-results/?lang=en for further information on interpreting progress measures.

Out-of-year testing

Where a learner has taken a test that is different from their national curriculum year group test, look up their progress measure using the table appropriate for the test taken. Their progress measure compares the learner to all other learners who have taken the same test.

For example, for a learner in national curriculum Year 4 who has taken test 3EP15/3CG15 and has a raw score of 20 it is possible to look up a Year 3 progress measure. A raw score of 20 gives a Year 3 progress measure of 1009 which indicates that the learner has performed at around the same level as the average learner in Year 3.

When comparing progress measures over time it is important to consider the reference group (the national curriculum year group the learner is compared with), as this may be different from one year to the next.

Table 9: Year 2 Test 2EP15/2CG15 raw score to progress measure conversion table

Total score	Progress measure
0	950
1	961
2	967
3	970
4	973
5	976
6	979
7	982
8	984
9	987
10	989
11	992
12	994
13	997
14	999
15	1002
16	1004
17	1007
18	1010
19	1012
20	1015
21	1018
22	1021
23	1025
24	1029
25	1032
26	1038
27	1046
28	1050

Table 10: Year 3 Test 3EP15/3CG15 raw score to progress measure conversion table

Total score	Progress measure
0	950
1	955
2	963
3	968
4	971
5	975
6	978
7	981
8	983
9	986
10	988
11	990
12	993
13	995
14	997
15	999
16	1001
17	1003
18	1005
19	1007
20	1009
21	1011
22	1014
23	1016
24	1018
25	1021
26	1025
27	1028
28	1033
29	1041
30	1050

Table 11: Year 4 Test 4EP15/4CG15 raw score to progress measure conversion table

Total score	Progress measure
0	950
1	951
2	959
3	964
4	968
5	971
6	974
7	977
8	979
9	982
10	984
11	986
12	988
13	991
14	993
15	995
16	997
17	999
18	1001
19	1003
20	1005
21	1007
22	1009
23	1011
24	1013
25	1016
26	1018
27	1020
28	1023
29	1026
30	1029
31	1033
32	1037
33	1044
34	1050
35	1050

Table 12: Year 5 Test 5EP15/5CG15 raw score to progress measure conversion table

Total score	Progress measure
0	950
1	951
2	960
3	965
4	969
5	972
6	975
7	978
8	981
9	983
10	986
11	988
12	990
13	992
14	994
15	996
16	999
17	1000
18	1002
19	1004
20	1006
21	1008
22	1010
23	1013
24	1015
25	1017
26	1019
27	1021
28	1024
29	1027
30	1029
31	1033
32	1037
33	1042
34	1050
35	1050

Table 13: Year 6 Test 6EP15/6CG15 raw score to progress measure conversion table

Total score	Progress measure
0	950
1	950
2	953
3	959
4	964
5	968
6	971
7	974
8	977
9	979
10	982
11	984
12	986
13	988
14	990
15	992
16	994
17	996
18	998
19	1000
20	1002
21	1004
22	1005
23	1007
24	1009
25	1011
26	1013
27	1016
28	1018
29	1021
30	1024
31	1027
32	1031
33	1036
34	1044
35	1050

Table 14: Year 7 Test 7EP15/7CG15 raw score to progress measure conversion table

Total score	Progress measure
0	959
1	971
2	975
3	980
4	984
5	987
6	990
7	993
8	996
9	998
10	1000
11	1002
12	1004
13	1006
14	1008
15	1010
16	1011
17	1013
18	1014
19	1016
20	1018
21	1019
22	1021
23	1023
24	1024
25	1026
26	1028
27	1030
28	1032
29	1034
30	1037
31	1040
32	1044
33	1050
34	1050
35	1050

Table 15: Year 8 Test 8EP15/8CG15 raw score to progress measure conversion table

Total score	Progress measure
0	950
1	967
2	972
3	977
4	981
5	985
6	988
7	991
8	994
9	997
10	1000
11	1002
12	1004
13	1006
14	1008
15	1010
16	1012
17	1014
18	1016
19	1018
20	1020
21	1022
22	1024
23	1026
24	1028
25	1030
26	1032
27	1035
28	1037
29	1040
30	1043
31	1047
32	1050
33	1050
34	1050
35	1050
36	1050

Table 16: Year 9 Test 9EP15/9CG15 raw score to progress measure conversion table

Total score	Progress measure
0	950
1	967
2	971
3	974
4	978
5	982
6	985
7	988
8	990
9	993
10	995
11	998
12	1000
13	1002
14	1004
15	1006
16	1008
17	1010
18	1012
19	1014
20	1016
21	1019
22	1021
23	1023
24	1025
25	1027
26	1030
27	1032
28	1034
29	1037
30	1039
31	1043
32	1047
33	1050
34	1050
35	1050
36	1050

