

Calculating learners' scores Procedural Numeracy Tests Years 2–6

National Numeracy Tests

2016



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 May 2016.

Age-standardised scores

The age-standardised score scales make it possible to compare an individual learner's performance on the test in 2016 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 <http://learning.gov.wales/resources/browse-all/reporting-and-interpreting-national-test-results-2016/?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 1–5 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 3EP16/3CG16 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: 2EP16/2CG16 raw score to age-standardised score conversion table

Year 2 Procedural Numeracy 2EP16/2CG16													
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	*	*	*	*	*	*	*	*	*	*	*	*	*
2	74	74	73	72	72	71	71	70	70	*	*	*	*
3	77	77	76	76	75	75	74	73	73	72	72	71	71
4	80	79	79	78	78	77	76	76	75	75	74	74	73
5	83	82	81	80	80	79	78	78	77	77	76	76	75
6	85	84	84	83	82	81	80	80	79	78	78	77	77
7	88	87	86	85	84	83	82	82	81	80	79	79	78
8	90	89	88	87	86	85	84	84	83	82	81	80	80
9	92	91	90	89	88	87	86	86	85	84	83	82	81
10	95	94	93	92	90	89	88	87	87	86	85	84	83
11	97	96	95	94	93	92	90	89	88	87	87	86	85
12	99	98	97	96	95	94	93	91	90	89	88	87	86
13	101	100	99	98	97	96	95	93	92	91	90	89	88
14	103	102	101	100	99	98	97	95	94	93	92	91	90
15	105	104	103	102	101	100	99	98	96	95	94	93	92
16	107	106	105	104	103	102	101	99	98	97	96	95	94
17	109	108	107	106	105	104	103	102	100	99	98	97	96
18	110	110	109	108	107	106	105	104	103	102	100	99	98
19	112	111	111	110	109	108	107	106	105	104	103	102	101
20	114	113	113	112	111	110	109	108	107	106	105	104	103
21	116	115	115	114	113	112	111	110	109	108	107	106	105
22	118	117	117	116	115	114	113	113	112	111	110	109	108
23	121	120	119	118	117	117	116	115	114	113	113	112	111

Table 2: 3EP16/3CG16 raw score to age-standardised score conversion table

Year 3 Procedural Numeracy 3EP16/3CG16													
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	75	75	74	74	74	73	73	73	72	72	72	71	71
2	79	78	78	78	77	77	77	76	76	75	75	75	74
3	82	81	80	80	79	79	79	78	78	78	77	77	77
4	84	84	83	83	82	81	81	80	79	79	79	78	78
5	87	86	85	85	84	83	83	82	82	81	80	80	79
6	89	88	88	87	86	85	85	84	84	83	82	82	81
7	91	90	89	89	88	87	87	86	85	85	84	83	83
8	93	92	91	91	90	89	88	88	87	86	86	85	84
9	95	94	93	92	91	91	90	89	88	88	87	86	86
10	96	95	95	94	93	92	92	91	90	89	89	88	87
11	98	97	96	95	95	94	93	92	92	91	90	89	89
12	99	99	98	97	96	95	95	94	93	92	91	91	90
13	101	100	99	99	98	97	96	95	94	94	93	92	91
14	103	102	101	100	99	98	98	97	96	95	94	94	93
15	104	103	102	102	101	100	99	98	97	97	96	95	94
16	106	105	104	103	102	101	101	100	99	98	97	96	96
17	107	107	106	105	104	103	102	101	100	100	99	98	97
18	109	108	107	106	106	105	104	103	102	101	100	99	99
19	111	110	109	108	107	106	105	105	104	103	102	101	100
20	112	111	111	110	109	108	107	106	105	105	104	103	102
21	114	113	112	112	111	110	109	108	107	106	106	105	104
22	116	115	114	113	113	112	111	110	109	108	108	107	106
23	118	117	116	116	115	114	113	112	111	110	110	109	108

Table 3: 4EP16/4CG16 raw score to age-standardised score conversion table

Year 4 Procedural Numeracy 4EP16/4CG16													
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	76	76	76	75	75	75	75	74	74	74	73	73	73
2	79	79	78	78	78	78	77	77	77	77	76	76	76
3	82	82	81	80	80	79	79	79	79	78	78	78	77
4	85	84	84	83	82	82	81	81	80	80	79	79	79
5	87	86	86	85	84	84	83	83	82	82	81	81	80
6	89	89	88	87	86	86	85	84	84	83	83	82	82
7	91	90	90	89	88	88	87	86	86	85	84	84	83
8	93	92	91	91	90	89	89	88	87	87	86	85	85
9	95	94	93	92	92	91	90	89	89	88	87	87	86
10	96	95	95	94	93	92	92	91	90	90	89	88	87
11	98	97	96	95	95	94	93	92	92	91	90	89	89
12	99	99	98	97	96	95	95	94	93	92	92	91	90
13	101	100	99	98	98	97	96	95	94	94	93	92	91
14	102	101	101	100	99	98	97	97	96	95	94	93	93
15	104	103	102	101	100	100	99	98	97	96	96	95	94
16	105	104	103	103	102	101	100	99	98	98	97	96	95
17	106	106	105	104	103	102	101	101	100	99	98	97	97
18	108	107	106	105	104	104	103	102	101	100	99	99	98
19	109	108	108	107	106	105	104	103	102	102	101	100	99
20	111	110	109	108	107	106	106	105	104	103	102	101	101
21	112	111	110	110	109	108	107	106	105	104	104	103	102
22	113	113	112	111	110	109	108	108	107	106	105	104	103
23	115	114	113	112	112	111	110	109	108	107	107	106	105

Table 4: 5EP16/5CG16 raw score to age-standardised score conversion table

Year 5 Procedural Numeracy 5EP16/5CG16													
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	77	76	76	76	76	76	75	75	75	75	75	74	74
2	79	79	79	78	78	78	78	78	77	77	77	77	77
3	82	81	81	80	80	79	79	79	79	79	78	78	78
4	84	84	83	83	82	82	81	81	80	80	79	79	79
5	87	86	85	85	84	84	83	83	82	82	81	81	80
6	89	88	87	87	86	86	85	85	84	84	83	83	82
7	91	90	89	89	88	87	87	86	86	85	85	84	84
8	92	92	91	90	90	89	89	88	87	87	86	86	85
9	94	94	93	92	92	91	90	90	89	88	88	87	87
10	96	95	94	94	93	92	92	91	90	90	89	89	88
11	97	97	96	95	95	94	93	93	92	91	91	90	89
12	99	98	97	97	96	95	95	94	93	93	92	91	91
13	100	99	99	98	97	97	96	95	95	94	93	93	92
14	102	101	100	99	99	98	97	97	96	95	95	94	93
15	103	102	102	101	100	99	99	98	97	97	96	95	95
16	104	103	103	102	101	101	100	99	99	98	97	97	96
17	105	105	104	103	103	102	101	101	100	99	99	98	97
18	107	106	105	105	104	103	103	102	101	101	100	99	99
19	108	107	107	106	105	105	104	103	103	102	101	100	100
20	109	109	108	107	107	106	105	105	104	103	102	102	101
21	110	110	109	108	108	107	106	106	105	104	104	103	102
22	112	111	110	110	109	108	108	107	106	106	105	104	104
23	113	112	112	111	110	110	109	108	108	107	106	106	105

Table 5: 6EP16/6CG16 raw score to age-standardised score conversion table

Year 6 Procedural Numeracy 6EP16/6CG16													
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	73	73	72	72	72	72	71	71	71	71	70	70	70
2	77	77	76	76	76	75	75	75	75	74	74	74	74
3	79	79	79	78	78	78	78	77	77	77	77	76	76
4	82	81	81	81	80	80	79	79	79	79	78	78	78
5	84	84	83	83	82	82	81	81	81	80	80	79	79
6	86	86	85	85	84	84	83	83	83	82	82	81	81
7	88	87	87	86	86	85	85	85	84	84	83	83	82
8	90	89	89	88	88	87	87	86	86	85	85	84	84
9	91	91	90	90	89	89	88	88	87	87	86	86	85
10	93	92	92	91	91	90	90	89	89	88	88	87	87
11	94	94	93	93	92	92	91	91	90	90	89	89	88
12	96	95	95	94	94	93	93	92	92	91	91	90	89
13	97	97	96	96	95	95	94	94	93	92	92	91	91
14	99	98	98	97	97	96	95	95	94	94	93	93	92
15	100	100	99	99	98	97	97	96	96	95	95	94	93
16	102	101	101	100	99	99	98	98	97	96	96	95	95
17	103	103	102	101	101	100	100	99	98	98	97	97	96
18	105	104	103	103	102	102	101	100	100	99	99	98	97
19	106	105	105	104	104	103	102	102	101	101	100	99	99
20	107	107	106	106	105	104	104	103	103	102	101	101	100
21	109	108	107	107	106	106	105	105	104	103	103	102	102
22	110	109	109	108	108	107	107	106	106	105	104	104	103
23	111	111	110	110	109	109	108	108	107	106	106	105	105

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 6–10 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 4EP16/4CG16 and has a raw score of 20 would have a progress measure of 1008.

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 2016 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 <http://learning.gov.wales/resources/browse-all/reporting-and-interpreting-national-test-results-2016/?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 3EP16/3CG16 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 1010 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 6: Year 2 Test 2EP16/2CG16 raw score to progress measure conversion table

Total score	Progress measure
0	950
1	954
2	961
3	966
4	969
5	972
6	975
7	977
8	980
9	983
10	985
11	988
12	991
13	993
14	996
15	999
16	1001
17	1004
18	1006
19	1009
20	1012
21	1015
22	1018
23	1021
24	1025
25	1029
26	1033
27	1041
28	1050

Table 7: Year 3 Test 3EP16/3CG16 raw score to progress measure conversion table

Total score	Progress measure
0	950
1	964
2	969
3	972
4	975
5	978
6	980
7	983
8	985
9	987
10	989
11	991
12	993
13	995
14	997
15	999
16	1001
17	1003
18	1005
19	1008
20	1010
21	1012
22	1015
23	1017
24	1020
25	1024
26	1027
27	1031
28	1036
29	1045
30	1050

Table 8: Year 4 Test 4EP16/4CG16 raw score to progress measure conversion table

Total score	Progress measure
0	951
1	966
2	970
3	972
4	975
5	978
6	981
7	983
8	985
9	987
10	989
11	991
12	993
13	995
14	997
15	999
16	1000
17	1002
18	1004
19	1006
20	1008
21	1010
22	1012
23	1014
24	1016
25	1018
26	1020
27	1022
28	1025
29	1027
30	1030
31	1033
32	1037
33	1043
34	1050
35	1050

Table 9: Year 5 Test 5EP16/5CG16 raw score to progress measure conversion table

Total score	Progress measure
0	952
1	967
2	970
3	972
4	975
5	978
6	981
7	983
8	985
9	987
10	989
11	991
12	993
13	995
14	997
15	999
16	1000
17	1002
18	1004
19	1005
20	1007
21	1009
22	1011
23	1012
24	1014
25	1016
26	1018
27	1020
28	1022
29	1025
30	1028
31	1030
32	1034
33	1038
34	1046
35	1050

Table 10: Year 6 Test 6EP16/6CG16 raw score to progress measure conversion table

Total score	Progress measure
0	950
1	962
2	967
3	970
4	973
5	976
6	978
7	980
8	982
9	985
10	987
11	989
12	990
13	992
14	994
15	996
16	998
17	1000
18	1002
19	1003
20	1005
21	1007
22	1009
23	1011
24	1013
25	1015
26	1017
27	1019
28	1022
29	1024
30	1027
31	1030
32	1034
33	1038
34	1046
35	1050

