Calculating learners' scores
Procedural Numeracy Tests
Years 7–9

National Numeracy Tests

2017

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 2017.

Age-standardised scores

The age-standardised score scales make it possible to compare an individual learner's performance on the test in 2017 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-2017/?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 1–3 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 7EP17/7CG17 and is 12 years and 3 months (12.03) and has a raw score of 18 would have an age-standardised score of 106.

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: 7EP17/7CG17 raw score to age-standardised score conversion table

Year 7 Procedural Numeracy 7EP17/7CG17													
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	70	*	*	*	*	*	*	*	*	*	*	*	*
1	78	78	78	78	78	78	77	77	77	77	77	77	77
2	81	81	81	80	80	80	79	79	79	79	79	79	79
3	84	84	84	83	83	83	82	82	82	82	81	81	81
4	87	86	86	86	85	85	85	84	84	84	84	83	83
5	89	89	88	88	88	87	87	87	86	86	85	85	85
6	91	91	90	90	90	89	89	88	88	88	87	87	87
7	93	93	92	92	92	91	91	90	90	89	89	89	88
8	95	94	94	94	93	93	92	92	92	91	91	90	90
9	97	96	96	95	95	94	94	94	93	93	92	92	92
10	98	98	97	97	96	96	96	95	95	94	94	93	93
11	100	99	99	98	98	97	97	97	96	96	95	95	94
12	101	101	100	100	99	99	98	98	97	97	97	96	96
13	103	102	102	101	101	100	100	99	99	98	98	98	97
14	104	104	103	103	102	102	101	101	100	100	99	99	98
15	105	105	104	104	103	103	103	102	102	101	101	100	100
16	107	106	106	105	105	104	104	103	103	102	102	102	101
17	108	108	107	107	106	106	105	105	104	104	103	103	102
18	110	109	109	108	108	107	107	106	106	105	105	104	104
19	112	111	110	110	109	109	108	108	107	107	106	106	105
20	113	113	112	111	111	110	110	109	109	108	108	107	107
21	115	114	114	113	113	112	111	111	110	110	109	109	108
22	117	116	115	115	114	114	113	113	112	111	111	110	110
23	118	118	117	117	116	115	115	114	114	113	113	112	111

Year 7 Procedural Numeracy 7EP17/7CG17

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**
24	120	120	119	119	118	117	117	116	116	115	114	114	113
25	122	122	121	121	120	119	119	118	118	117	116	116	115
26	124	124	123	122	122	121	121	120	120	119	119	118	117
27	126	126	125	124	124	123	123	122	122	121	121	120	120
28	128	128	127	127	126	126	125	125	124	124	123	122	122
29	131	130	130	129	129	128	128	127	127	126	125	125	124
30	134	133	132	132	131	131	130	130	129	129	128	128	127
31	137	136	136	135	135	134	134	133	133	132	132	131	131
32	**	140	140	139	139	138	138	137	137	136	136	135	135
33	**	**	**	**	**	**	**	**	**	**	**	**	140
34	**	**	**	**	**	**	**	**	**	**	**	**	**
35	**	**	**	**	**	**	**	**	**	**	**	**	**

Table 2: 8EP17/8CG17 raw score to age-standardised score conversion table

Year 8 Procedural Numeracy 8EP17/8CG17													
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	78	78	78	78	78	77	77	77	77	77	77	77	77
2	81	81	81	80	80	80	79	79	79	79	79	79	79
3	84	84	83	83	83	83	82	82	82	81	81	81	81
4	87	86	86	85	85	85	84	84	84	84	83	83	83
5	89	88	88	87	87	87	86	86	86	85	85	85	84
6	91	90	90	89	89	89	88	88	87	87	87	86	86
7	92	92	91	91	91	90	90	89	89	89	88	88	88
8	94	93	93	93	92	92	91	91	91	90	90	89	89
9	95	95	95	94	94	93	93	92	92	92	91	91	90
10	97	96	96	95	95	95	94	94	93	93	92	92	92
11	98	98	97	97	96	96	96	95	95	94	94	93	93
12	99	99	99	98	98	97	97	96	96	95	95	95	94
13	101	100	100	99	99	98	98	98	97	97	96	96	95
14	102	102	101	101	100	100	99	99	98	98	97	97	97
15	103	103	102	102	101	101	100	100	100	99	99	98	98
16	104	104	103	103	103	102	102	101	101	100	100	99	99
17	106	105	105	104	104	103	103	102	102	101	101	100	100
18	107	106	106	105	105	104	104	103	103	103	102	102	101
19	108	108	107	107	106	106	105	105	104	104	103	103	102
20	109	109	108	108	107	107	106	106	105	105	104	104	104
21	110	110	109	109	109	108	108	107	107	106	106	105	105
22	112	111	111	110	110	109	109	108	108	107	107	106	106
23	113	113	112	112	111	111	110	110	109	109	108	108	107

Year 8 Procedural Numeracy 8EP17/8CG17

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**
24	115	114	114	113	113	112	112	111	111	110	110	109	109
25	116	116	115	115	114	114	113	113	112	112	111	110	110
26	118	117	117	116	116	115	115	114	114	113	113	112	112
27	119	119	118	118	117	117	116	116	115	115	114	114	113
28	121	120	120	119	119	118	118	117	117	116	116	115	115
29	123	122	122	121	121	120	120	119	119	118	118	117	117
30	125	124	124	123	123	122	122	121	121	121	120	120	119
31	127	126	126	125	125	125	124	124	123	123	122	122	121
32	129	129	129	128	128	127	127	126	126	125	125	124	124
33	133	132	132	131	131	130	130	130	129	129	128	128	127
34	137	137	136	136	135	135	134	134	134	133	133	132	132
35	**	**	**	**	**	**	**	**	**	**	140	140	139
36	**	**	**	**	**	**	**	**	**	**	**	**	**

Table 3: 9EP17/9CG17 raw score to age-standardised score conversion table

Year 9 Procedural Numeracy 9EP17/9CG17													
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	75	75	75	75	75	74	74	74	74	74	74	74	74
2	78	78	78	78	78	78	77	77	77	77	77	77	77
3	80	80	80	80	80	79	79	79	79	79	79	79	79
4	83	83	83	83	83	82	82	82	82	82	81	81	81
5	86	86	86	85	85	85	85	84	84	84	84	84	83
6	89	88	88	88	87	87	87	87	87	86	86	86	86
7	91	90	90	90	90	89	89	89	89	88	88	88	88
8	93	93	92	92	92	91	91	91	91	90	90	90	90
9	95	94	94	94	94	93	93	93	93	92	92	92	91
10	97	96	96	96	95	95	95	95	94	94	94	93	93
11	98	98	98	97	97	97	97	96	96	96	95	95	95
12	100	100	99	99	99	99	98	98	98	97	97	97	97
13	102	101	101	101	100	100	100	100	99	99	99	98	98
14	103	103	103	102	102	102	102	101	101	101	100	100	100
15	105	105	104	104	104	103	103	103	103	102	102	102	101
16	107	106	106	106	105	105	105	104	104	104	103	103	103
17	108	108	108	107	107	107	106	106	106	105	105	105	104
18	110	110	109	109	109	108	108	108	107	107	107	106	106
19	111	111	111	110	110	110	110	109	109	109	108	108	108
20	113	113	112	112	112	111	111	111	110	110	110	110	109
21	115	114	114	114	113	113	113	112	112	112	111	111	111
22	116	116	116	115	115	115	114	114	114	113	113	113	113
23	118	118	117	117	117	116	116	116	115	115	115	115	114

Year 9 Procedural Numeracy 9EP17/9CG17

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**
24	120	119	119	119	118	118	118	117	117	117	117	116	116
25	121	121	121	120	120	120	119	119	119	119	118	118	118
26	123	122	122	122	122	121	121	121	121	120	120	120	120
27	124	124	124	123	123	123	123	122	122	122	122	122	121
28	126	126	125	125	125	125	124	124	124	124	123	123	123
29	128	127	127	127	127	126	126	126	126	126	125	125	125
30	130	130	129	129	129	129	128	128	128	128	127	127	127
31	132	132	132	131	131	131	131	130	130	130	130	129	129
32	135	135	134	134	134	134	133	133	133	133	132	132	132
33	138	138	138	138	137	137	137	137	136	136	136	136	135
34	**	**	**	**	**	**	**	**	**	**	**	140	140
35	**	**	**	**	**	**	**	**	**	**	**	**	**
36	**	**	**	**	**	**	**	**	**	**	**	**	**

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 4–6 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 7EP17/7CG17 and has a raw score of 20 would have a progress measure of 1013.

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 2017 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-2017/?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 8 who has taken test 7EP17/7CG17 and has a raw score of 14 it is possible to look up a Year 7 progress measure. A raw score of 14 gives a Year 7 progress measure of 1002 which indicates that the learner has performed at around the same level as the average learner in Year 7.

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 4: Year 7 Test 7EP17/7CG17 raw score to progress measure conversion table

Total score	Progress measure
0	959
1	970
2	973
3	977
4	980
5	983
6	985
7	988
8	990
9	992
10	994
11	996
12	998
13	1000
14	1002
15	1004
16	1005
17	1007
18	1009
19	1011
20	1013
21	1015
22	1018
23	1020
24	1023
25	1025
26	1028
27	1031
28	1034
29	1037
30	1040
31	1045
32	1050
33	1050
34	1050
35	1050

Table 5: Year 8 Test 8EP17/8CG17 raw score to progress measure conversion table

Total score	Progress measure
0	959
1	970
2	973
3	977
4	979
5	982
6	985
7	987
8	989
9	991
10	993
11	994
12	996
13	998
14	999
15	1001
16	1002
17	1004
18	1005
19	1007
20	1009
21	1010
22	1012
23	1014
24	1016
25	1018
26	1020
27	1022
28	1024
29	1027
30	1029
31	1032
32	1036
33	1040
34	1046
35	1050
36	1050

Table 6: Year 9 Test 9EP17/9CG17 raw score to progress measure conversion table

Total score	Progress measure
0	950
1	965
2	970
3	972
4	976
5	980
6	983
7	986
8	988
9	991
10	993
11	996
12	998
13	1000
14	1002
15	1004
16	1006
17	1009
18	1011
19	1013
20	1015
21	1017
22	1019
23	1022
24	1024
25	1026
26	1028
27	1030
28	1033
29	1035
30	1038
31	1041
32	1045
33	1049
34	1050
35	1050
36	1050