



## Equating PAT and e-asTTle scores

We have been asked how to equate PAT and e-asTTle scores. To the best of our knowledge no formal equivalence study has been published. This note provides rationale for using stanines as basis of equating and provides stanine tables for e-asTTle reading and mathematics scores.

Both PAT and e-asTTle report scale scores in terms of curriculum levels. However, it would seem a somewhat different approach to curriculum levels is taken. PAT shows scale scores could reflect two or more curriculum levels, whereas, scale scores in e-asTTle point to only one curriculum level. For example, PAT scale scores in [mathematics](#) seem to be ambiguous as to curriculum level; patm score of 55 aligns with Levels 3 and 4 and possibly touches Level 5. In contrast e-asTTle reports only one curriculum level for each score. Hence, it is difficult to make a direct comparison using curriculum level scores.

Nonetheless, stanines, which show rank relative to the norming population, do allow comparison between tests. The stanine (standardised nine) score divides the distribution of the test norming population into nine equally sized blocks, each of which is half a standard deviation (*SD*). The middle stanine, 5, covers the half standard deviation surrounding the mean, in other words  $\pm 1/4 SD$ . Then each subsequent stanine covers another half standard deviation either side of stanine 5. Because of the shape of the normal distribution, 55% of all candidates will get one of stanine 4, 5, or 6 – these are the average group. The lowest performing candidates (that is the lowest 22.5%) will get stanines 1 to 3, while the highest performing 22.50% will get stanines 7 to 9. Instead of having each rank represent a different amount of raw score, each stanine represents the same amount of distribution ( $1/2 SD$ ). See more information about stanines used in PAT and STAR from [NZCER](#). It is assumed that PAT users are able to easily obtain stanine values from the PAT system. However, e-asTTle only provides quarter by quarter mean scores, making comparison between test types difficult.

Thus, we offer the following plausible work-around, based on the known properties of stanines. In this technical note we provide a method of determining a student's stanine from the e-asTTle score. The e-asTTle *SD* = 100, which is equal to 2 stanines, since each stanine is half a *SD*. Thus, 1 stanine in e-asTTle is 50 points. We can use this value in conjunction with the published norms for e-asTTle, which are available for each quarter of Years 4 to 10 in the e-asTTle norm tables (<http://e-asTTle.tki.org.nz/Teacher-resources#normtables>).

**To exemplify:** the mean for e-asTTle Year 6 Quarter 1 in Reading is 1403.

Stanine 5 goes from  $1403 - (50/2) = 1378$  all the way up to  $1403 + (50/2) = 1428$ .

We keep adding or subtracting 50 points to get the score ranges of stanines above and below 5.

So a student who gets an e-asTTle score of 1503 in reading in the first term of Year 6 is 88 points better than the upper range of Stanine 5. This would put him or her in stanine 7.

To assist in rapid conversion of e-asTTle scores to stanines, the following tables for e-asTTle Reading and e-asTTle Mathematics, derived from the published 2010 norms, are provided on the following pages. Read each table by first identifying the Year and time period of the student being tested. Read across until the e-asTTle score is less than the reported value, look up to the stanine value in the column in which the e-asTTle score falls; this is the student's stanine for the test. Thus, relative performance on both tests can be compared through rank order stanines. A comparative study of asTTle and PAT scores was reported in asTTle v4 and is available on [TKI](#).

Please bear in mind that this procedure only equates rank order scores. The reader will have to judge the validity of comparing a specific e-asTTle test with a specific PAT test. Transforming scores onto a common stanine scale does not make test content equivalent.

<u>asTTle Reading norm</u>			<u>Stanine starting value</u>								
Quarter	Year	Mean Score	1	2	3	4	5	6	7	8	9
1	4	1301	<1126	1126	1176	1226	1276	1326	1376	1426	1476
2	4	1306	<1131	1131	1181	1231	1281	1331	1381	1431	1481
3	4	1317	<1142	1142	1192	1242	1292	1342	1392	1442	1492
4	4	1333	<1158	1158	1208	1258	1308	1358	1408	1458	1508
1	5	1346	<1171	1171	1221	1271	1321	1371	1421	1471	1521
2	5	1360	<1185	1185	1235	1285	1335	1385	1435	1485	1535
3	5	1372	<1197	1197	1247	1297	1347	1397	1447	1497	1547
4	5	1390	<1215	1215	1265	1315	1365	1415	1465	1515	1565
1	6	1403	<1228	1228	1278	1328	1378	1428	1478	1528	1578
2	6	1416	<1241	1241	1291	1341	1391	1441	1491	1541	1591
3	6	1425	<1250	1250	1300	1350	1400	1450	1500	1550	1600
4	6	1426	<1251	1251	1301	1351	1401	1451	1501	1551	1601
1	7	1430	<1255	1255	1305	1355	1405	1455	1505	1555	1605
2	7	1436	<1261	1261	1311	1361	1411	1461	1511	1561	1611
3	7	1447	<1272	1272	1322	1372	1422	1472	1522	1572	1622
4	7	1453	<1278	1278	1328	1378	1428	1478	1528	1578	1628
1	8	1462	<1287	1287	1337	1387	1437	1487	1537	1587	1637
2	8	1474	<1299	1299	1349	1399	1449	1499	1549	1599	1649
3	8	1489	<1314	1314	1364	1414	1464	1514	1564	1614	1664
4	8	1494	<1319	1319	1369	1419	1469	1519	1569	1619	1669
1	9	1497	<1322	1322	1372	1422	1472	1522	1572	1622	1672
2	9	1499	<1324	1324	1374	1424	1474	1524	1574	1624	1674
3	9	1507	<1332	1332	1382	1432	1482	1532	1582	1632	1682
4	9	1519	<1344	1344	1394	1444	1494	1544	1594	1644	1694
1	10	1529	<1354	1354	1404	1454	1504	1554	1604	1654	1704
2	10	1539	<1364	1364	1414	1464	1514	1564	1614	1664	1714
3	10	1545	<1370	1370	1420	1470	1520	1570	1620	1670	1720
4	10	1567	<1392	1392	1442	1492	1542	1592	1642	1692	1742
1	11	1590	<1415	1415	1465	1515	1565	1615	1665	1715	1765
2	11	1612	<1437	1437	1487	1537	1587	1637	1687	1737	1787
3	11	1621	<1446	1446	1496	1546	1596	1646	1696	1746	1796
4	11	1628	<1453	1453	1503	1553	1603	1653	1703	1753	1803
1	12	1636	<1461	1461	1511	1561	1611	1661	1711	1761	1811
2	12	1643	<1468	1468	1518	1568	1618	1668	1718	1768	1818
3	12	1652	<1477	1477	1527	1577	1627	1677	1727	1777	1827
4	12	1657	<1482	1482	1532	1582	1632	1682	1732	1782	1832

<u>asTTle Mathematics norm</u>			<u>Stanine starting value</u>								
Quarter	Year	Mean Score	1	2	3	4	5	6	7	8	9
1	4	1358	<1183	1183	1233	1283	1333	1383	1433	1483	1533
2	4	1364	<1189	1189	1239	1289	1339	1389	1439	1489	1539
3	4	1375	<1200	1200	1250	1300	1350	1400	1450	1500	1550
4	4	1389	<1214	1214	1264	1314	1364	1414	1464	1514	1564
1	5	1400	<1225	1225	1275	1325	1375	1425	1475	1525	1575
2	5	1410	<1235	1235	1285	1335	1385	1435	1485	1535	1585
3	5	1420	<1245	1245	1295	1345	1395	1445	1495	1545	1595
4	5	1430	<1255	1255	1305	1355	1405	1455	1505	1555	1605
1	6	1441	<1266	1266	1316	1366	1416	1466	1516	1566	1616
2	6	1451	<1276	1276	1326	1376	1426	1476	1526	1576	1626
3	6	1460	<1285	1285	1335	1385	1435	1485	1535	1585	1635
4	6	1466	<1291	1291	1341	1391	1441	1491	1541	1591	1641
1	7	1472	<1297	1297	1347	1397	1447	1497	1547	1597	1647
2	7	1479	<1304	1304	1354	1404	1454	1504	1554	1604	1654
3	7	1489	<1314	1314	1364	1414	1464	1514	1564	1614	1664
4	7	1500	<1325	1325	1375	1425	1475	1525	1575	1625	1675
1	8	1512	<1337	1337	1387	1437	1487	1537	1587	1637	1687
2	8	1521	<1346	1346	1396	1446	1496	1546	1596	1646	1696
3	8	1529	<1354	1354	1404	1454	1504	1554	1604	1654	1704
4	8	1535	<1360	1360	1410	1460	1510	1560	1610	1660	1710
1	9	1540	<1365	1365	1415	1465	1515	1565	1615	1665	1715
2	9	1545	<1370	1370	1420	1470	1520	1570	1620	1670	1720
3	9	1554	<1379	1379	1429	1479	1529	1579	1629	1679	1729
4	9	1567	<1392	1392	1442	1492	1542	1592	1642	1692	1742
1	10	1579	<1404	1404	1454	1504	1554	1604	1654	1704	1754
2	10	1590	<1415	1415	1465	1515	1565	1615	1665	1715	1765
3	10	1593	<1418	1418	1468	1518	1568	1618	1668	1718	1768
4	10	1601	<1426	1426	1476	1526	1576	1626	1676	1726	1776
1	11	1608	<1433	1433	1483	1533	1583	1633	1683	1733	1783
2	11	1622	<1447	1447	1497	1547	1597	1647	1697	1747	1797
3	11	1636	<1461	1461	1511	1561	1611	1661	1711	1761	1811
4	11	1650	<1475	1475	1525	1575	1625	1675	1725	1775	1825
1	12	1664	<1489	1489	1539	1589	1639	1689	1739	1789	1839
2	12	1678	<1503	1503	1553	1603	1653	1703	1753	1803	1853
3	12	1692	<1517	1517	1567	1617	1667	1717	1767	1817	1867
4	12	1699	<1524	1524	1574	1624	1674	1724	1774	1824	1874

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**Version Control Information.**

This version inserts the correct mean score for the e-asTTle Maths score. All stanine start values were correct.