

**DRAFT**

**PROFICIENCY ASSESSMENTS FOR  
WYOMING STUDENTS (PAWS)**

**2014 Concordance Tables  
Reading Grades 3–8**

Prepared by  
Educational Testing Service

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## Executive Summary

The Proficiency Assessment Wyoming Students (PAWS) is a set of standardized criterion-referenced tests in Reading, Mathematics, and Science for Grades 3 to 8. The 2014 PAWS assessments utilizes the Common Core Strands as reporting categories and becomes the new scale measuring students' academic performance on 2012 Wyoming Content Performance Standards (2012 WyCPS). PAWS assessments are designed to provide information for use as federal, state, and local indicators of the extent to which students satisfy academic performance requirements.

On 5/16/14, the WDE selected the vertical scale as the scale of choice for the PAWS Reading measuring the 2012 WyCPS. A standard setting meeting will be held in July to set the cut scores for different performance levels. No information related to students' proficiency levels is available currently.

This report outlines the analyses performed and presents the concordance tables for the Spring 2014 Grades 3 to 8 Reading administration of the Proficiency Assessments for Wyoming Students (PAWS). In support of validity, all technical support and analyses were carried out in accordance with both the *Standards for Educational and Psychological Testing* (AERA, APA, NCME, 1999), issued jointly by the American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education, and the *ETS Standards for Quality and Fairness* (ETS, 2002).

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## TABLE OF CONTENTS

|   |     |
|---|-----|
| Executive Summary .....                       | iii |
| TABLE OF CONTENTS.....                        | v   |
| LIST OF TABLES.....                           | vi  |
| Glossary of Abbreviations .....               | vii |
| 2014-2013 Concordance Tables Procedure .....  | 1   |
| References.....                               | 3   |
| Appendix A: 2014-2013 Concordance Tables..... | 4   |

## LIST OF TABLES

|   |    |
|---|----|
| Table A1. Reading Grade 3 Concordance Table ..... | 5  |
| Table A2. Reading Grade 4 Concordance Table ..... | 6  |
| Table A3. Reading Grade 5 Concordance Table ..... | 7  |
| Table A4. Reading Grade 6 Concordance Table ..... | 8  |
| Table A5. Reading Grade 7 Concordance Table ..... | 9  |
| Table A6. Reading Grade 8 Concordance Table ..... | 10 |

## Glossary of Abbreviations

A glossary of abbreviations is given below for reference.

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| Abbreviation or Term | Meaning  |
|----------------------|--|
| ETS                  | Educational Testing Service  |
| Form                 | Operational items and embedded field test items that uniquely define a (test) booklet  |
| MC                   | Multiple-choice item (worth 1-point)   |
| WDE                  | Wyoming Department of Education  |
| TEST                 | Operational test items in a testing booklet that contribute to reported student scores |
| PAWS                 | Wyoming Proficiency Assessments for Wyoming Students                                   |
| 2012 WyCPS           | 2012 Wyoming Content Performance Standards   |
| LTKEY                | Literary: Key Ideas and Details  |
| LTCRF                | Literary: Craft and Structure  |
| INFKY                | Information: Key Ideas and Details   |
| INFCR                | Information: Craft and Structure   |
| INTEG                | Integration of Knowledge and Ideas   |
| LANG                 | Language   |

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## 2014-2013 Concordance Tables Procedure

In 2014, new content standards were implemented thus new reporting scales were established for the PAWS Reading tests for grades 3 through 8. Unfortunately, the set of items between 2013 and 2014 are the field test items and cannot be used as anchors to perform an equating between 2013 and 2014 PAWS tests. Therefore, concordance tables were needed to link the 2013 test scores and 2014 test score. The concordance tables are to be used for the one-time score comparison between 2013 and 2014 tests but not for future years. The equivalent groups equipercentile equating method was used to create the concordance table for each grade-level in Reading test. The frequency distribution of 2013 and 2014 demographics was reviewed to evaluate the “equivalency” of two populations.

In the equipercentile equating, an X score ( $x$ ) and a Y score ( $y$ ) are defined as comparable if  $x$  and  $y$  have the same percentile rank in the target population, T. That is,

$$y = eg_{YT}(x) = G_T^{-1}[F_T(x)] = G_T^{-1} \circ F_T(x),$$

where  $eg_{YT}(x)$  is the equivalent groups equipercentile equating function in population T that is used to convert scores on new form X (i.e., 2014 PAWS Reading test) to the scale of the old form Y (i.e., 2013 PAWS Reading test);  $F_T(x)$  is the cumulative distribution function of X in the population T; and  $G_T^{-1}$  is the inverse of the cumulative distribution function  $G_T(y)$ , which is the cumulative distribution function of Y in the population T. In order to have inverse functions for  $F_T(x)$  and  $G_T(y)$ , we assume that  $F_T(x)$  and  $G_T(y)$  are continuous and strictly increasing.

For the equipercentile equating, smoothing was performed using the loglinear univariate model, preserving the number of marginal moments that resulted in the smallest value of the Akaike Information Criterion (AIC) (Moses & Holland, 2009). For 2013 and 2014, PAWS Reading score distributions of all grades, the number of moments preserved ranged from 6 to 8.

The concordance tables of 2014 and 2013 Reading tests based on the final chosen scale are included in Appendix A. For each grade, two matched columns of scale scores are given. The two columns show all possible scale scores for PAWS 2013 and the corresponding PAWS 2014 scale scores, as estimated by the equating study. For example, at grade 3 a PAWS Reading scale score of 333 is statistically equivalent to a PAWS 2014 scale score of 375. Without the equating study, one might

erroneously conclude that there has been a gain of 42 scale score points in achievement from 2013 to 2014, while achievement has actually remained relatively stable. It must be emphasized that the design used in this analysis is sufficiently precise to permit the one-time comparison of scores when Wyoming transitioned from administering the PAWS 2013 under the 2008 standards to the 2014 PAWS tests under the 2012 WyCPS. These equated scores are estimations and, thus, small differences of a few scale score points should not be overly emphasized.

When states update their testing programs by administering a new assessment, there are often observed differences in the scores between the new and previous tests. Frequently, administering a new test results in lower scores because, along with other possible reasons, students and teachers are not familiar with the structure/ content of the new test. However, scores tend to rise as familiarity increases. Therefore, there is often a concern about an artificial drop in scores when a new test is administered, and the Wyoming Department of Education shared these concerns.

## References

- AERA, APA, and NCME (1999). *Standards for educational and psychological testing*. Washington, DC: American Educational Research Association.
- ETS (2002). *ETS standards for quality and fairness*. Princeton, NJ: Educational Testing Service.
- Moses, T., & Holland, P. W. (2009). Selection strategies for univariate loglinear smoothing models and their effect on equating function accuracy. *Journal of Educational Measurement*, 46(2), 159–176.

**Appendix A: 2014-2013 Concordance Tables**

Table A1. Reading Grade 3 Concordance Table

| 2013 PAWS | 2014 PAWS |
|-----------|-----------|
| 336       | 375       |
| 370       | 387       |
| 404       | 402       |
| 425       | 415       |
| 441       | 428       |
| 453       | 440       |
| 463       | 452       |
| 472       | 462       |
| 480       | 471       |
| 487       | 480       |
| 494       | 488       |
| 500       | 496       |
| 506       | 503       |
| 512       | 510       |
| 517       | 516       |
| 522       | 523       |
| 527       | 529       |
| 532       | 534       |
| 536       | 539       |
| 541       | 544       |
| 545       | 549       |
| 549       | 553       |
| 554       | 557       |
| 558       | 561       |
| 562       | 565       |
| 567       | 569       |

| 2013 PAWS | 2014 PAWS |
|-----------|-----------|
| 571       | 572       |
| 575       | 576       |
| 579       | 580       |
| 584       | 584       |
| 588       | 588       |
| 593       | 592       |
| 597       | 596       |
| 602       | 601       |
| 607       | 605       |
| 611       | 609       |
| 617       | 613       |
| 622       | 617       |
| 628       | 622       |
| 633       | 627       |
| 640       | 633       |
| 646       | 638       |
| 654       | 645       |
| 662       | 653       |
| 671       | 662       |
| 681       | 674       |
| 694       | 688       |
| 709       | 707       |
| 730       | 736       |
| 765       | 761       |
| 800       | 779       |

Table A2. Reading Grade 4 Concordance Table

| 2013 PAWS | 2014 PAWS |
|-----------|-----------|
| 385       | 400       |
| 420       | 405       |
| 455       | 420       |
| 477       | 437       |
| 492       | 450       |
| 505       | 460       |
| 516       | 469       |
| 525       | 477       |
| 534       | 485       |
| 541       | 492       |
| 548       | 498       |
| 555       | 504       |
| 561       | 510       |
| 567       | 516       |
| 573       | 521       |
| 578       | 527       |
| 583       | 532       |
| 588       | 537       |
| 593       | 543       |
| 598       | 548       |
| 603       | 552       |
| 607       | 558       |
| 612       | 562       |
| 617       | 566       |
| 621       | 571       |
| 625       | 575       |
| 630       | 579       |
| 634       | 583       |
| 639       | 588       |
| 643       | 592       |
| 648       | 595       |
| 653       | 600       |
| 657       | 604       |
| 662       | 608       |
| 667       | 612       |
| 672       | 617       |
| 677       | 621       |
| 683       | 625       |
| 688       | 629       |
| 694       | 634       |

| 2013 PAWS | 2014 PAWS |
|-----------|-----------|
| 701       | 639       |
| 707       | 644       |
| 715       | 650       |
| 723       | 656       |
| 732       | 663       |
| 742       | 671       |
| 755       | 681       |
| 770       | 692       |
| 791       | 707       |
| 826       | 730       |
| 860       | 766       |

Table A3. Reading Grade 5 Concordance Table

| 2013 PAWS | 2014 PAWS |
|-----------|-----------|
| 401       | 425       |
| 435       | 425       |
| 469       | 425       |
| 490       | 434       |
| 506       | 448       |
| 518       | 460       |
| 528       | 470       |
| 537       | 479       |
| 545       | 487       |
| 552       | 495       |
| 558       | 502       |
| 564       | 509       |
| 570       | 516       |
| 575       | 523       |
| 580       | 530       |
| 585       | 537       |
| 590       | 544       |
| 594       | 551       |
| 599       | 557       |
| 603       | 563       |
| 607       | 568       |
| 611       | 573       |
| 615       | 577       |
| 619       | 581       |
| 623       | 585       |
| 627       | 588       |
| 631       | 592       |
| 635       | 595       |
| 638       | 598       |
| 642       | 601       |
| 646       | 605       |
| 650       | 608       |
| 654       | 611       |
| 658       | 615       |
| 662       | 619       |
| 666       | 622       |
| 670       | 626       |
| 675       | 630       |
| 679       | 634       |
| 684       | 638       |

| 2013 PAWS | 2014 PAWS |
|-----------|-----------|
| 689       | 643       |
| 694       | 648       |
| 699       | 653       |
| 704       | 658       |
| 710       | 664       |
| 717       | 670       |
| 724       | 677       |
| 732       | 685       |
| 740       | 694       |
| 750       | 704       |
| 762       | 718       |
| 777       | 736       |
| 798       | 763       |
| 833       | 786       |
| 867       | 806       |

Table A4. Reading Grade 6 Concordance Table

| 2013 PAWS | 2014 PAWS |
|-----------|-----------|
| 407       | 469       |
| 442       | 478       |
| 478       | 483       |
| 499       | 486       |
| 515       | 490       |
| 527       | 493       |
| 538       | 497       |
| 547       | 502       |
| 555       | 506       |
| 563       | 511       |
| 569       | 515       |
| 576       | 520       |
| 582       | 525       |
| 587       | 530       |
| 592       | 535       |
| 597       | 539       |
| 602       | 543       |
| 607       | 548       |
| 611       | 552       |
| 616       | 557       |
| 620       | 561       |
| 624       | 565       |
| 628       | 570       |
| 632       | 574       |
| 636       | 578       |
| 640       | 582       |
| 644       | 586       |
| 648       | 590       |
| 652       | 594       |
| 656       | 598       |
| 660       | 603       |
| 663       | 607       |
| 667       | 611       |
| 671       | 615       |
| 675       | 619       |
| 679       | 623       |
| 683       | 628       |
| 687       | 633       |
| 692       | 638       |
| 696       | 642       |

| 2013 PAWS | 2014 PAWS |
|-----------|-----------|
| 701       | 647       |
| 705       | 653       |
| 710       | 658       |
| 715       | 664       |
| 721       | 671       |
| 726       | 677       |
| 732       | 685       |
| 739       | 693       |
| 746       | 701       |
| 754       | 711       |
| 762       | 722       |
| 773       | 736       |
| 785       | 754       |
| 800       | 783       |
| 821       | 807       |
| 855       | 827       |
| 889       | 833       |

Table A5. Reading Grade 7 Concordance Table

| 2013 PAWS | 2014 PAWS |
|-----------|-----------|
| 427       | 475       |
| 462       | 476       |
| 497       | 485       |
| 518       | 497       |
| 534       | 507       |
| 546       | 516       |
| 557       | 523       |
| 566       | 529       |
| 574       | 535       |
| 581       | 541       |
| 588       | 547       |
| 594       | 552       |
| 600       | 557       |
| 605       | 561       |
| 611       | 566       |
| 615       | 570       |
| 620       | 575       |
| 625       | 579       |
| 629       | 583       |
| 634       | 587       |
| 638       | 591       |
| 642       | 595       |
| 646       | 599       |
| 650       | 603       |
| 654       | 607       |
| 658       | 611       |
| 662       | 615       |
| 666       | 619       |
| 670       | 622       |
| 673       | 626       |
| 677       | 631       |
| 681       | 634       |
| 685       | 638       |
| 689       | 642       |
| 693       | 646       |
| 697       | 650       |
| 701       | 654       |
| 705       | 658       |
| 710       | 662       |
| 714       | 666       |

| 2013 PAWS | 2014 PAWS |
|-----------|-----------|
| 718       | 671       |
| 723       | 675       |
| 728       | 680       |
| 733       | 685       |
| 739       | 691       |
| 744       | 696       |
| 750       | 702       |
| 757       | 709       |
| 764       | 717       |
| 772       | 726       |
| 781       | 737       |
| 791       | 751       |
| 803       | 770       |
| 819       | 797       |
| 840       | 820       |
| 874       | 839       |
| 908       | 844       |

Table A6. Reading Grade 8 Concordance Table

| 2013 PAWS | 2014 PAWS |
|-----------|-----------|
| 442       | 500       |
| 476       | 500       |
| 510       | 500       |
| 531       | 500       |
| 546       | 500       |
| 558       | 500       |
| 568       | 502       |
| 577       | 507       |
| 584       | 515       |
| 591       | 522       |
| 598       | 530       |
| 604       | 539       |
| 609       | 546       |
| 615       | 554       |
| 620       | 561       |
| 624       | 568       |
| 629       | 574       |
| 633       | 580       |
| 637       | 586       |
| 642       | 592       |
| 646       | 597       |
| 650       | 602       |
| 653       | 607       |
| 657       | 612       |
| 661       | 616       |
| 665       | 620       |
| 668       | 624       |
| 672       | 628       |
| 676       | 632       |
| 680       | 636       |
| 683       | 640       |
| 687       | 643       |
| 691       | 648       |
| 694       | 651       |
| 698       | 655       |
| 702       | 659       |
| 706       | 663       |
| 710       | 667       |
| 714       | 671       |
| 718       | 676       |

| 2013 PAWS | 2014 PAWS |
|-----------|-----------|
| 723       | 680       |
| 727       | 685       |
| 732       | 689       |
| 737       | 695       |
| 742       | 700       |
| 748       | 705       |
| 754       | 712       |
| 760       | 718       |
| 767       | 724       |
| 775       | 731       |
| 783       | 740       |
| 793       | 750       |
| 805       | 761       |
| 820       | 776       |
| 841       | 797       |
| 875       | 810       |
| 909       | 834       |

