

MARCH 2005 OHIO ACHIEVEMENT TESTS ADMINISTRATION

STATISTICAL SUMMARY

This document provides a summary of information from the March 2005 administration of the Ohio Achievement Tests. The statistics shown are computed from the entire population of Ohio public school students (including community school students) for each subject and grade tested during the March 2005 administration. Table 1 summarizes parameters computed from the data. Table 2 shows the percent of students at each performance level for each grade and test. Table 3 shows the raw score cut points computed from test data. Table 4 shows the conversions of raw scores to scaled scores.

Table 1. - Summary of parameters from the March 2005 Administration of the Ohio Achievement Tests

| | Grade 3 | | Grade 4 | | Grade 5 | Grade 7 | Grade 8 | |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| | Reading | Math | Reading | Writing | Reading | Math | Reading | Math |
| N-count | 119,477 | 129,490 | 132,117 | 131,999 | 134,847 | 142,192 | 143,044 | 142,783 |
| Max Raw Score | 49 | 52 | 49 | 39 | 49 | 50 | 48 | 46 |
| Max Scaled Score | 493 | 520 | 552 | 515 | 535 | 565 | 539 | 551 |
| Raw Score Mean | 36.22 | 35.27 | 29.92 | 25.20 | 30.95 | 20.36 | 29.54 | 19.35 |
| Raw Score Standard Deviation | 8.39 | 9.25 | 9.03 | 6.29 | 9.11 | 9.73 | 9.48 | 9.10 |
| Raw Score SEM | 3.29 | 3.23 | 3.10 | 3.01 | 3.26 | 3.30 | 3.39 | 2.94 |
| Scaled Score Mean | 414.38 | 414.86 | 420.42 | 417.92 | 417.46 | 408.77 | 420.47 | 408.77 |
| Scaled Score Standard Deviation | 27.07 | 29.99 | 30.05 | 30.06 | 30.06 | 30.00 | 30.01 | 30.00 |
| Scaled Score SEM | 10.60 | 10.47 | 10.30 | 14.42 | 10.75 | 10.17 | 10.72 | 9.69 |
| Reliability | 0.85 | 0.88 | 0.88 | 0.77 | 0.87 | 0.89 | 0.87 | 0.90 |

Table 2. - Percentage of Students at Each Performance Level

| | Grade 3 | | Grade 4 | | Grade 5 | Grade 7 | Grade 8 | |
|-------------|---------|---------|---------|---------|---------|---------|---------|---------|
| | Reading | Math | Reading | Writing | Reading | Math | Reading | Math |
| Standard | Percent |
| Limited | 12.04 | 10.76 | 11.12 | 8.64 | 12.88 | 11.71 | 8.22 | 14.54 |
| Basic | 13.10 | 19.05 | 12.31 | 13.08 | 10.29 | 30.20 | 13.02 | 25.73 |
| Proficient | 22.96 | 36.60 | 41.11 | 52.25 | 54.27 | 38.84 | 35.57 | 36.31 |
| Accelerated | 26.18 | 19.58 | 30.32 | 22.01 | 14.86 | 12.84 | 27.48 | 17.79 |
| Advanced | 25.71 | 14.01 | 5.15 | 4.02 | 7.69 | 6.41 | 15.70 | 5.63 |

Table 3. - Cut Score Points for Basic, Proficient, Accelerated, and Advanced Standards, March 2005 Administration

| Grade | Subject | Score | Limited | Basic | Proficient | Accelerated | Advanced |
|-------|---------|--------|-----------|-------|------------|-------------|----------|
| 3 | Reading | Raw | Below 26 | 26 | 32 | 38 | 43 |
| | | Scaled | Below 385 | 385 | 400 | 415 | 432 |
| | Math | Raw | Below 23 | 23 | 31 | 41 | 46 |
| | | Scaled | Below 378 | 378 | 400 | 429 | 447 |
| 4 | Reading | Raw | Below 18 | 18 | 24 | 35 | 43 |
| | | Scaled | Below 384 | 384 | 400 | 435 | 467 |
| | Writing | Raw | Below 17 | 17 | 21 | 30 | 36 |
| | | Scaled | Below 383 | 383 | 400 | 436 | 472 |
| 5 | Reading | Raw | Below 20 | 20 | 25 | 39 | 43 |
| | | Scaled | Below 384 | 384 | 400 | 441 | 459 |
| 7 | Math | Raw | Below 10 | 10 | 17 | 30 | 38 |
| | | Scaled | Below 378 | 378 | 400 | 436 | 458 |
| 8 | Reading | Raw | Below 15 | 15 | 22 | 33 | 40 |
| | | Scaled | Below 378 | 378 | 400 | 428 | 451 |
| | Math | Raw | Below 10 | 10 | 16 | 27 | 36 |
| | | Scaled | Below 379 | 379 | 400 | 432 | 459 |

Equating and Scaling: The conversion of Raw Scores to Scaled Scores

Test Form Construction

The March 2005 Achievement Tests are made up of items that have been field-tested, but not previously used in operational test forms. Item difficulty estimates from the field test administration are used to pre-equate operational forms during form construction.

Common Item Equating

Following administration of the March 2005 achievement tests, item difficulty values were estimated using an early return sample for grade 3 reading and the entire population for other subject and grade tests. The early return sample was selected to be statistically representative of all Ohio 3rd-grade public school students. Because item difficulty estimates were available from the previous field tests, all the operational items could

potentially serve as anchor items in the equating process. A stepwise deletion procedure was used to calibrate the early return/calibration and equating data and to calculate the linking constant needed to bring the set of operational items back to the reference scale for each grade and subject.

Calibrating, equating and linking proceeded through four steps. First, the current administration difficulty values (from the early return sample) were computed and compared with the “bank” or reference difficulty values. The mean difference between the current and the bank difficulties of the anchor items is called the equating constant. Second, the equating constant was added to each difficulty value for items on the current test so that the mean item difficulties are equal. In step three, the “linked” current values were compared with the original bank values to identify the item with the largest absolute difference between the two values. If the absolute value of the difference is greater than 0.3, the item was eliminated as an anchor item. Fourth, this procedure was repeated until the largest difference between a linked current value and bank value is less than 0.3 (logits). This procedure ensured that the items used to anchor the operational test to the reference scale are stable. When the equating process was complete, item difficulties from the current administration were directly comparable with those from the bank.

Scaling

Ohio performance standards are expressed in scaled scores. Scaled scores are the invariant measure while raw scores reflect minor shifts in the difficulty of test items in any test administration. A scaled score of 400 for the March administration is the same as a scaled score of 400 from the October administration. But the number of raw score points corresponding to a 400 may shift slightly from administration to administration.

After the March 2005 operational test administration, test items were calibrated and equated. Rasch ability estimates (called theta scores) were computed for each possible raw score examinees achieved. The Rasch ability estimates were then transformed to the appropriate Ohio Achievement Test scale scores, all of which are calibrated so that the proficient standard is equal to a scaled score of 400.

Ohio Rounding Rule

Raw scores are integers that rarely have associated integer scaled scores at the points used to define Ohio performance standards. Therefore Ohio uses a rounding rule to match the raw score with the scaled score nearest the academic standard (e.g. 400 points scaled score for proficient) to establish the raw score cut points (e.g. proficient). For example, if a raw score of 31 is associated with an observed scaled score of 399.14, and 399.14 is the closest observed scaled score to the proficient level performance standard, the scaled score is rounded up to 400. For that test, an examinee must have a raw score of 31 or more to be judged proficient.

If the closest scaled score value for an integer raw score exceeds the standard, then that raw score serves as the raw score cut point.

Table 4 provides the concordance between raw scores and scaled scores for all tests in the March 2005 administration of the Ohio Achievement Tests.

Table 4. - Raw Score to Scaled Score Conversion, March 2005 Administration

| Raw Score | Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject | | | | | | | |
|-----------|--|------|---------|---------|---------|---------|---------|------|
| | Grade 3 | | Grade 4 | | Grade 5 | Grade 7 | Grade 8 | |
| | Reading | Math | Reading | Writing | Reading | Math | Reading | Math |
| 0 | 245 | 239 | 259 | 203 | 247 | 273 | 258 | 282 |
| 1 | 265 | 260 | 280 | 225 | 268 | 296 | 280 | 302 |
| 2 | 284 | 280 | 300 | 248 | 290 | 318 | 302 | 322 |
| 3 | 296 | 293 | 313 | 270 | 304 | 332 | 315 | 335 |
| 4 | 305 | 302 | 322 | 290 | 313 | 342 | 325 | 344 |
| 5 | 312 | 310 | 330 | 305 | 321 | 350 | 333 | 352 |
| 6 | 318 | 317 | 337 | 318 | 328 | 357 | 340 | 359 |
| 7 | 324 | 322 | 342 | 329 | 334 | 363 | 346 | 364 |
| 8 | 329 | 327 | 347 | 338 | 340 | 368 | 351 | 370 |
| 9 | 333 | 332 | 352 | 345 | 345 | 373 | 356 | 374 |
| 10 | 337 | 337 | 356 | 351 | 349 | 378 | 360 | 379 |
| 11 | 341 | 341 | 361 | 356 | 353 | 381 | 364 | 383 |
| 12 | 345 | 345 | 364 | 361 | 357 | 385 | 368 | 387 |
| 13 | 348 | 348 | 368 | 366 | 361 | 389 | 372 | 390 |
| 14 | 352 | 352 | 371 | 370 | 365 | 392 | 375 | 394 |
| 15 | 355 | 355 | 375 | 374 | 369 | 395 | 379 | 397 |
| 16 | 358 | 359 | 378 | 378 | 372 | 398 | 382 | 401 |
| 17 | 361 | 362 | 381 | 383 | 375 | 401 | 385 | 404 |
| 18 | 363 | 365 | 384 | 386 | 378 | 404 | 388 | 407 |
| 19 | 366 | 368 | 387 | 390 | 382 | 407 | 391 | 410 |
| 20 | 369 | 371 | 390 | 394 | 385 | 410 | 394 | 413 |
| 21 | 371 | 374 | 393 | 400 | 388 | 413 | 397 | 416 |
| 22 | 374 | 376 | 396 | 403 | 391 | 415 | 400 | 418 |
| 23 | 376 | 379 | 399 | 407 | 393 | 418 | 402 | 421 |
| 24 | 379 | 382 | 401 | 411 | 396 | 420 | 404 | 424 |
| 25 | 382 | 385 | 404 | 415 | 400 | 423 | 407 | 427 |
| 26 | 385 | 387 | 407 | 419 | 402 | 425 | 410 | 430 |
| 27 | 387 | 390 | 410 | 424 | 405 | 428 | 412 | 432 |
| 28 | 389 | 392 | 413 | 428 | 408 | 431 | 415 | 435 |
| 29 | 392 | 395 | 416 | 433 | 410 | 433 | 417 | 438 |
| 30 | 394 | 398 | 419 | 438 | 413 | 436 | 420 | 441 |
| 31 | 397 | 400 | 422 | 443 | 416 | 438 | 422 | 444 |
| 32 | 400 | 403 | 425 | 448 | 419 | 441 | 425 | 447 |
| 33 | 402 | 406 | 428 | 453 | 422 | 444 | 428 | 450 |
| 34 | 405 | 408 | 431 | 460 | 425 | 447 | 430 | 453 |
| 35 | 408 | 411 | 435 | 466 | 428 | 449 | 433 | 457 |
| 36 | 411 | 414 | 438 | 474 | 431 | 452 | 437 | 460 |
| 37 | 413 | 416 | 441 | 484 | 434 | 456 | 440 | 464 |
| 38 | 416 | 419 | 445 | 500 | 438 | 459 | 443 | 468 |

**Table 4. - Raw Score to Scaled Score Conversion, March 2005 Administration
(continued)**

| Raw Score | Scaled Scores Corresponding to Raw Score Points for Each Grade and Subject | | | | | | | |
|-----------|--|------|---------|---------|---------|---------|---------|------|
| | Grade 3 | | Grade 4 | | Grade 5 | Grade 7 | Grade 8 | |
| | Reading | Math | Reading | Writing | Reading | Math | Reading | Math |
| 39 | 419 | 422 | 449 | 515 | 441 | 462 | 447 | 473 |
| 40 | 422 | 425 | 453 | | 445 | 466 | 451 | 478 |
| 41 | 425 | 429 | 458 | | 449 | 470 | 456 | 484 |
| 42 | 429 | 432 | 463 | | 454 | 474 | 461 | 491 |
| 43 | 432 | 436 | 469 | | 459 | 479 | 467 | 500 |
| 44 | 437 | 439 | 475 | | 465 | 485 | 475 | 512 |
| 45 | 442 | 444 | 483 | | 472 | 491 | 484 | 532 |
| 46 | 449 | 449 | 493 | | 481 | 498 | 497 | 551 |
| 47 | 459 | 454 | 507 | | 493 | 508 | 518 | |
| 48 | 476 | 461 | 530 | | 514 | 521 | 539 | |
| 49 | 493 | 469 | 552 | | 535 | 543 | | |
| 50 | | 481 | | | | 565 | | |
| 51 | | 500 | | | | | | |
| 52 | | 520 | | | | | | |