

# Appendix E

## PERCENTILES AND STANDARD DEVIATIONS OF SCIENCE ACHIEVEMENT

**Table E.1**

**Percentiles of Achievement in the Sciences  
Upper Grade (Eighth Grade\*)**

| Country            | 5th Percentile | 25th Percentile | 50th Percentile | 75th Percentile | 95th Percentile |
|--------------------|----------------|-----------------|-----------------|-----------------|-----------------|
| Australia          | 371 (6.6)      | 475 (4.6)       | 545 (6.5)       | 619 (3.9)       | 720 (1.4)       |
| Austria            | 395 (6.0)      | 499 (4.1)       | 558 (3.7)       | 623 (6.0)       | 721 (2.6)       |
| Belgium (Fl)       | 416 (5.3)      | 499 (6.6)       | 548 (4.9)       | 609 (4.5)       | 680 (1.4)       |
| Belgium (Fr)       | 332 (5.4)      | 415 (3.9)       | 472 (5.3)       | 532 (4.5)       | 609 (5.7)       |
| Bulgaria           | 386 (5.2)      | 488 (2.0)       | 560 (7.3)       | 641 (4.3)       | 747 (6.9)       |
| Canada             | 380 (3.7)      | 472 (4.2)       | 529 (4.0)       | 594 (3.0)       | 685 (3.8)       |
| Colombia           | 291 (8.3)      | 358 (6.4)       | 410 (5.8)       | 467 (8.8)       | 533 (2.6)       |
| Cyprus             | 316 (1.4)      | 403 (2.8)       | 462 (3.0)       | 526 (2.9)       | 605 (4.2)       |
| Czech Republic     | 438 (4.9)      | 513 (2.9)       | 570 (5.3)       | 634 (5.1)       | 716 (4.5)       |
| Denmark            | 334 (5.4)      | 423 (3.8)       | 477 (3.6)       | 541 (3.2)       | 615 (3.0)       |
| England            | 380 (2.0)      | 484 (5.2)       | 549 (5.9)       | 625 (4.7)       | 727 (6.7)       |
| France             | 374 (3.9)      | 446 (4.6)       | 498 (3.9)       | 553 (3.1)       | 623 (4.6)       |
| Germany            | 362 (9.3)      | 463 (6.6)       | 535 (8.5)       | 602 (4.2)       | 691 (5.5)       |
| Greece             | 363 (3.8)      | 439 (2.3)       | 495 (2.2)       | 557 (3.0)       | 643 (1.4)       |
| Hong Kong          | 376 (10.6)     | 467 (7.1)       | 524 (7.2)       | 583 (4.1)       | 669 (1.4)       |
| Hungary            | 408 (6.1)      | 497 (5.2)       | 552 (4.2)       | 616 (4.2)       | 703 (2.5)       |
| Iceland            | 363 (0.6)      | 442 (5.3)       | 491 (3.8)       | 555 (6.9)       | 623 (14.7)      |
| Iran, Islamic Rep. | 355 (4.3)      | 422 (2.5)       | 467 (2.8)       | 520 (2.3)       | 592 (6.8)       |
| Ireland            | 383 (2.6)      | 471 (10.1)      | 536 (5.0)       | 605 (4.9)       | 694 (1.9)       |
| Israel             | 356 (14.7)     | 460 (9.1)       | 526 (10.4)      | 591 (5.3)       | 694 (11.1)      |
| Japan              | 421 (0.5)      | 514 (4.3)       | 573 (1.5)       | 632 (1.8)       | 715 (1.7)       |
| Korea              | 408 (1.2)      | 504 (1.8)       | 564 (2.4)       | 629 (4.1)       | 719 (1.4)       |
| Kuwait             | 316 (7.1)      | 380 (5.4)       | 427 (3.4)       | 484 (4.9)       | 551 (2.7)       |
| Latvia (LSS)       | 353 (4.4)      | 432 (5.4)       | 482 (2.4)       | 540 (3.0)       | 625 (6.5)       |
| Lithuania          | 346 (2.7)      | 421 (8.5)       | 476 (5.8)       | 533 (3.1)       | 613 (5.3)       |
| Netherlands        | 419 (11.7)     | 505 (9.3)       | 561 (6.0)       | 619 (5.0)       | 701 (8.8)       |
| New Zealand        | 364 (6.9)      | 458 (6.3)       | 524 (5.5)       | 594 (3.6)       | 692 (3.7)       |
| Norway             | 385 (3.8)      | 470 (1.9)       | 526 (3.0)       | 588 (1.9)       | 671 (4.7)       |
| Portugal           | 362 (4.4)      | 429 (1.1)       | 477 (1.4)       | 531 (2.1)       | 602 (5.3)       |
| Romania            | 321 (3.8)      | 420 (8.5)       | 484 (5.2)       | 556 (6.7)       | 653 (6.6)       |
| Russian Federation | 386 (8.5)      | 474 (8.1)       | 535 (5.3)       | 606 (3.6)       | 697 (8.0)       |
| Scotland           | 357 (7.7)      | 451 (4.3)       | 513 (6.7)       | 584 (6.3)       | 686 (6.2)       |
| Singapore          | 457 (5.2)      | 541 (7.4)       | 603 (7.4)       | 674 (6.5)       | 768 (6.1)       |
| Slovak Republic    | 396 (7.1)      | 484 (8.8)       | 543 (5.6)       | 607 (4.3)       | 696 (2.3)       |
| Slovenia           | 421 (2.9)      | 501 (4.7)       | 556 (4.2)       | 620 (3.6)       | 709 (4.6)       |
| South Africa       | 185 (2.8)      | 261 (4.7)       | 313 (3.6)       | 376 (9.2)       | 526 (15.3)      |
| Spain              | 393 (4.0)      | 465 (1.7)       | 514 (2.9)       | 571 (3.1)       | 649 (3.3)       |
| Sweden             | 386 (5.5)      | 476 (6.2)       | 533 (5.2)       | 598 (4.1)       | 686 (1.7)       |
| Switzerland        | 371 (3.9)      | 460 (5.2)       | 524 (4.9)       | 587 (4.6)       | 669 (0.9)       |
| Thailand           | 409 (2.3)      | 479 (4.5)       | 525 (5.6)       | 575 (4.8)       | 646 (4.2)       |
| United States      | 359 (6.3)      | 465 (7.7)       | 537 (6.5)       | 608 (5.4)       | 705 (8.6)       |

\*Eighth grade in most countries; see Table 2 for more information about the grades tested in each country.

() Standard errors appear in parentheses.

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

**Table E.2**

**Percentiles of Achievement in the Sciences**  
**Lower Grade (Seventh Grade\*)**

| Country            | 5th Percentile | 25th Percentile | 50th Percentile | 75th Percentile | 95th Percentile |
|--------------------|----------------|-----------------|-----------------|-----------------|-----------------|
| Australia          | 339 (6.7)      | 437 (7.9)       | 504 (3.6)       | 576 (3.1)       | 676 (9.4)       |
| Austria            | 368 (12.8)     | 460 (5.1)       | 521 (3.5)       | 583 (6.0)       | 671 (6.0)       |
| Belgium (Fl)       | 412 (3.7)      | 480 (4.7)       | 526 (3.2)       | 579 (5.2)       | 648 (1.0)       |
| Belgium (Fr)       | 312 (7.5)      | 391 (2.2)       | 443 (3.8)       | 494 (7.1)       | 572 (1.6)       |
| Bulgaria           | 360 (8.6)      | 464 (2.6)       | 530 (7.4)       | 601 (7.8)       | 701 (10.5)      |
| Canada             | 358 (8.6)      | 441 (3.1)       | 496 (1.6)       | 559 (4.0)       | 653 (4.4)       |
| Colombia           | 271 (8.1)      | 338 (5.6)       | 386 (4.2)       | 439 (5.2)       | 505 (2.8)       |
| Cyprus             | 279 (8.1)      | 364 (3.4)       | 422 (2.1)       | 480 (3.8)       | 559 (1.8)       |
| Czech Republic     | 398 (2.7)      | 479 (5.3)       | 534 (6.3)       | 587 (7.4)       | 671 (9.6)       |
| Denmark            | 298 (2.8)      | 386 (1.3)       | 436 (3.1)       | 501 (2.6)       | 581 (20.6)      |
| England            | 342 (6.9)      | 444 (3.6)       | 511 (4.4)       | 584 (11.0)      | 678 (8.9)       |
| France             | 330 (3.3)      | 402 (3.3)       | 453 (5.9)       | 502 (1.4)       | 574 (2.0)       |
| Germany            | 345 (7.6)      | 439 (7.3)       | 499 (5.1)       | 564 (8.3)       | 655 (4.3)       |
| Greece             | 306 (1.0)      | 389 (5.0)       | 448 (4.1)       | 510 (2.4)       | 593 (2.7)       |
| Hong Kong          | 350 (8.9)      | 440 (5.3)       | 497 (7.3)       | 556 (4.0)       | 633 (5.1)       |
| Hungary            | 363 (5.9)      | 458 (7.6)       | 519 (5.8)       | 581 (5.1)       | 668 (7.2)       |
| Iceland            | 346 (3.5)      | 412 (5.9)       | 458 (3.4)       | 513 (4.0)       | 593 (1.5)       |
| Iran, Islamic Rep. | 324 (6.9)      | 387 (1.6)       | 433 (3.0)       | 486 (4.9)       | 557 (5.1)       |
| Ireland            | 348 (5.4)      | 435 (6.1)       | 494 (5.1)       | 558 (7.4)       | 645 (6.4)       |
| Japan              | 387 (3.8)      | 477 (1.1)       | 530 (2.3)       | 589 (2.7)       | 672 (6.6)       |
| Korea              | 379 (8.4)      | 478 (5.1)       | 538 (2.1)       | 598 (4.0)       | 677 (9.5)       |
| Latvia (LSS)       | 311 (5.2)      | 385 (4.2)       | 432 (2.2)       | 490 (3.6)       | 562 (4.8)       |
| Lithuania          | 273 (3.2)      | 355 (5.1)       | 400 (4.3)       | 455 (4.7)       | 536 (2.8)       |
| Netherlands        | 389 (5.4)      | 467 (5.9)       | 518 (4.0)       | 574 (4.6)       | 642 (5.6)       |
| New Zealand        | 324 (6.6)      | 416 (7.7)       | 481 (5.6)       | 548 (3.2)       | 642 (9.7)       |
| Norway             | 344 (2.3)      | 431 (5.5)       | 483 (4.4)       | 543 (4.2)       | 621 (11.0)      |
| Portugal           | 317 (2.4)      | 381 (3.0)       | 425 (2.9)       | 476 (4.3)       | 549 (1.7)       |
| Romania            | 290 (6.1)      | 384 (7.3)       | 450 (6.3)       | 523 (5.7)       | 614 (10.2)      |
| Russian Federation | 333 (8.0)      | 419 (5.9)       | 480 (5.7)       | 549 (6.6)       | 648 (11.7)      |
| Scotland           | 323 (10.3)     | 407 (6.0)       | 465 (5.2)       | 534 (5.5)       | 631 (4.7)       |
| Singapore          | 380 (8.1)      | 480 (11.2)      | 548 (9.9)       | 613 (7.7)       | 708 (4.1)       |
| Slovak Republic    | 374 (3.8)      | 453 (8.5)       | 507 (3.4)       | 565 (5.0)       | 652 (6.2)       |
| Slovenia           | 395 (9.1)      | 471 (1.7)       | 523 (3.7)       | 590 (2.7)       | 675 (6.0)       |
| South Africa       | 178 (3.8)      | 258 (3.4)       | 310 (4.7)       | 369 (6.7)       | 486 (15.6)      |
| Spain              | 350 (1.4)      | 422 (3.4)       | 474 (2.5)       | 532 (4.0)       | 612 (2.9)       |
| Sweden             | 351 (4.6)      | 434 (3.9)       | 485 (3.0)       | 547 (9.0)       | 627 (1.5)       |
| Switzerland        | 350 (3.8)      | 430 (3.5)       | 484 (3.2)       | 538 (3.1)       | 617 (4.3)       |
| Thailand           | 379 (2.6)      | 448 (3.3)       | 492 (3.7)       | 542 (3.0)       | 605 (3.9)       |
| United States      | 337 (9.5)      | 438 (10.7)      | 507 (7.3)       | 582 (6.8)       | 681 (7.2)       |

\*Seventh grade in most countries; see Table 2 for more information about the grades tested in each country.

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

**Table E.3**

**Standard Deviations of Achievement in the Sciences  
Upper Grade (Eighth Grade\*)**

| Country            | Overall   |                    | Boys      |                    | Girls     |                    |
|--------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
|                    | Mean      | Standard Deviation | Mean      | Standard Deviation | Mean      | Standard Deviation |
| Australia          | 545 (3.9) | 106                | 550 (5.2) | 110                | 540 (4.1) | 103                |
| Austria            | 558 (3.7) | 98                 | 566 (4.0) | 97                 | 549 (4.6) | 98                 |
| Belgium (Fl)       | 550 (4.2) | 81                 | 558 (6.0) | 82                 | 543 (5.8) | 79                 |
| Belgium (Fr)       | 471 (2.8) | 86                 | 479 (4.8) | 89                 | 463 (2.9) | 81                 |
| Bulgaria           | 565 (5.3) | 111                | — —       | —                  | — —       | —                  |
| Canada             | 531 (2.6) | 93                 | 537 (3.1) | 95                 | 525 (3.7) | 89                 |
| Colombia           | 411 (4.1) | 76                 | 418 (7.3) | 79                 | 405 (4.6) | 71                 |
| Cyprus             | 463 (1.9) | 89                 | 461 (2.2) | 93                 | 465 (2.7) | 83                 |
| Czech Republic     | 574 (4.3) | 87                 | 586 (4.2) | 87                 | 562 (5.8) | 85                 |
| Denmark            | 478 (3.1) | 88                 | 494 (3.6) | 90                 | 463 (3.9) | 83                 |
| England            | 552 (3.3) | 106                | 562 (5.6) | 108                | 542 (4.2) | 102                |
| France             | 498 (2.5) | 77                 | 506 (2.7) | 76                 | 490 (3.3) | 77                 |
| Germany            | 531 (4.8) | 101                | 542 (5.9) | 101                | 524 (4.9) | 99                 |
| Greece             | 497 (2.2) | 85                 | 505 (2.6) | 85                 | 489 (3.1) | 84                 |
| Hong Kong          | 522 (4.7) | 89                 | 535 (5.5) | 90                 | 507 (5.1) | 86                 |
| Hungary            | 554 (2.8) | 90                 | 563 (3.1) | 89                 | 545 (3.4) | 90                 |
| Iceland            | 494 (4.0) | 79                 | 501 (5.1) | 83                 | 486 (4.6) | 74                 |
| Iran, Islamic Rep. | 470 (2.4) | 73                 | 477 (3.8) | 76                 | 461 (3.2) | 67                 |
| Ireland            | 538 (4.5) | 96                 | 544 (6.6) | 99                 | 532 (5.2) | 92                 |
| Israel             | 524 (5.7) | 104                | 545 (6.4) | 103                | 512 (6.1) | 98                 |
| Japan              | 571 (1.6) | 90                 | 579 (2.4) | 93                 | 562 (2.0) | 86                 |
| Korea              | 565 (1.9) | 94                 | 576 (2.7) | 95                 | 551 (2.3) | 91                 |
| Kuwait             | 430 (3.7) | 74                 | — —       | —                  | — —       | —                  |
| Latvia (LSS)       | 485 (2.7) | 81                 | 492 (3.3) | 82                 | 478 (3.2) | 79                 |
| Lithuania          | 476 (3.4) | 81                 | 484 (3.8) | 81                 | 470 (4.0) | 81                 |
| Netherlands        | 560 (5.0) | 85                 | 570 (6.4) | 85                 | 550 (4.9) | 83                 |
| New Zealand        | 525 (4.4) | 100                | 538 (5.4) | 103                | 512 (5.2) | 95                 |
| Norway             | 527 (1.9) | 87                 | 534 (3.2) | 91                 | 520 (2.0) | 83                 |
| Portugal           | 480 (2.3) | 74                 | 490 (2.8) | 73                 | 468 (2.7) | 73                 |
| Romania            | 486 (4.7) | 102                | 492 (5.3) | 104                | 480 (5.0) | 99                 |
| Russian Federation | 538 (4.0) | 95                 | 544 (4.9) | 97                 | 533 (3.7) | 93                 |
| Scotland           | 517 (5.1) | 100                | 527 (6.4) | 102                | 507 (4.7) | 96                 |
| Singapore          | 607 (5.5) | 95                 | 612 (6.7) | 95                 | 603 (7.0) | 95                 |
| Slovak Republic    | 544 (3.2) | 92                 | 552 (3.5) | 92                 | 537 (3.9) | 92                 |
| Slovenia           | 560 (2.5) | 88                 | 573 (3.2) | 89                 | 548 (3.2) | 85                 |
| South Africa       | 326 (6.6) | 99                 | 337 (9.5) | 102                | 315 (6.0) | 94                 |
| Spain              | 517 (1.7) | 78                 | 526 (2.1) | 77                 | 508 (2.3) | 77                 |
| Sweden             | 535 (3.0) | 90                 | 543 (3.4) | 91                 | 528 (3.4) | 89                 |
| Switzerland        | 522 (2.5) | 91                 | 529 (3.2) | 94                 | 514 (3.0) | 87                 |
| Thailand           | 525 (3.7) | 72                 | 524 (3.9) | 72                 | 526 (4.3) | 72                 |
| United States      | 534 (4.7) | 106                | 539 (4.9) | 110                | 530 (5.2) | 101                |

\*Eighth grade in most countries; see Table 2 for information about the grades tested in each country.

A dash (—) indicates data are not available.

( ) Standard errors appear in parentheses.

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-95.

**Table E.4**
**Standard Deviations of Achievement in the Sciences  
Lower Grade (Seventh Grade\*)**

| Country            | Overall   |                    | Boys      |                    | Girls     |                    |
|--------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
|                    | Mean      | Standard Deviation | Mean      | Standard Deviation | Mean      | Standard Deviation |
| Australia          | 504 (3.6) | 103                | 507 (5.2) | 107                | 502 (4.0) | 98                 |
| Austria            | 519 (3.1) | 94                 | 522 (4.3) | 98                 | 516 (4.1) | 90                 |
| Belgium (Fl)       | 529 (2.6) | 73                 | 536 (3.3) | 75                 | 521 (3.1) | 71                 |
| Belgium (Fr)       | 442 (3.0) | 79                 | 453 (3.6) | 78                 | 432 (3.5) | 78                 |
| Bulgaria           | 531 (5.4) | 103                | --        | --                 | --        | --                 |
| Canada             | 499 (2.3) | 90                 | 505 (2.9) | 94                 | 493 (2.5) | 84                 |
| Colombia           | 387 (3.2) | 72                 | 396 (3.8) | 74                 | 378 (4.4) | 69                 |
| Cyprus             | 420 (1.8) | 87                 | 420 (2.8) | 91                 | 420 (2.6) | 82                 |
| Czech Republic     | 533 (3.3) | 82                 | 543 (3.2) | 82                 | 523 (4.1) | 80                 |
| Denmark            | 439 (2.1) | 86                 | 452 (3.0) | 89                 | 427 (2.8) | 83                 |
| England            | 512 (3.5) | 101                | 522 (5.6) | 103                | 500 (4.6) | 97                 |
| France             | 451 (2.6) | 74                 | 461 (3.1) | 76                 | 443 (3.0) | 72                 |
| Germany            | 499 (4.1) | 96                 | 505 (4.9) | 97                 | 495 (4.5) | 93                 |
| Greece             | 449 (2.6) | 87                 | 452 (3.2) | 90                 | 446 (2.8) | 85                 |
| Hong Kong          | 495 (5.5) | 86                 | 503 (6.6) | 88                 | 485 (5.8) | 83                 |
| Hungary            | 518 (3.2) | 91                 | 525 (3.9) | 94                 | 510 (3.4) | 89                 |
| Iceland            | 462 (2.8) | 75                 | 468 (4.4) | 77                 | 456 (2.4) | 73                 |
| Iran, Islamic Rep. | 436 (2.6) | 72                 | 443 (2.9) | 75                 | 428 (4.1) | 66                 |
| Ireland            | 495 (3.5) | 91                 | 504 (4.6) | 91                 | 487 (4.5) | 90                 |
| Israel             | --        | --                 | --        | --                 | --        | --                 |
| Japan              | 531 (1.9) | 86                 | 536 (2.6) | 89                 | 526 (1.9) | 83                 |
| Korea              | 535 (2.1) | 92                 | 545 (2.8) | 92                 | 521 (3.2) | 90                 |
| Kuwait             | --        | --                 | --        | --                 | --        | --                 |
| Latvia (LSS)       | 435 (2.7) | 78                 | 440 (3.6) | 81                 | 430 (3.0) | 74                 |
| Lithuania          | 403 (3.4) | 79                 | 405 (3.5) | 81                 | 401 (4.2) | 77                 |
| Netherlands        | 517 (3.6) | 79                 | 523 (4.0) | 80                 | 512 (4.4) | 78                 |
| New Zealand        | 481 (3.4) | 97                 | 489 (4.3) | 100                | 472 (3.7) | 92                 |
| Norway             | 483 (2.9) | 85                 | 489 (3.6) | 88                 | 477 (3.6) | 81                 |
| Portugal           | 428 (2.1) | 71                 | 436 (2.4) | 74                 | 420 (2.4) | 68                 |
| Romania            | 452 (4.4) | 100                | 456 (4.7) | 101                | 448 (4.9) | 99                 |
| Russian Federation | 484 (4.2) | 94                 | 493 (5.3) | 99                 | 475 (3.8) | 89                 |
| Scotland           | 468 (3.8) | 94                 | 477 (4.4) | 97                 | 459 (4.1) | 90                 |
| Singapore          | 545 (6.6) | 100                | 548 (7.9) | 102                | 541 (8.2) | 98                 |
| Slovak Republic    | 510 (3.0) | 85                 | 520 (4.0) | 86                 | 499 (3.1) | 82                 |
| Slovenia           | 530 (2.4) | 86                 | 539 (3.0) | 86                 | 521 (2.8) | 85                 |
| South Africa       | 317 (5.3) | 92                 | 324 (6.4) | 93                 | 312 (5.2) | 91                 |
| Spain              | 477 (2.1) | 80                 | 487 (2.9) | 82                 | 467 (2.3) | 76                 |
| Sweden             | 488 (2.6) | 84                 | 493 (2.9) | 87                 | 484 (3.3) | 81                 |
| Switzerland        | 484 (2.5) | 82                 | 492 (2.9) | 83                 | 475 (2.9) | 80                 |
| Thailand           | 493 (3.0) | 69                 | 495 (3.3) | 71                 | 492 (3.5) | 68                 |
| United States      | 508 (5.5) | 105                | 514 (6.3) | 109                | 502 (5.8) | 100                |

\*Seventh grade in most countries; see Table 2 for information about the grades tested in each country.

A dash (–) indicates data are not available. Israel and Kuwait did not test the lower grade.

( ) Standard errors appear in parentheses.

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994–95.

