

# Appendix D

## Percentiles and Standard Deviations of Mathematics Achievement in the Cognitive Domains

**Exhibit D.1: Percentiles of Achievement in Knowing Cognitive Domain**

Countries	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile
Armenia	347 (4.9)	429 (3.4)	484 (2.9)	535 (4.2)	600 (3.7)
Australia	381 (7.8)	451 (3.2)	497 (5.2)	544 (4.8)	609 (7.8)
Bahrain	265 (4.9)	342 (2.4)	401 (3.1)	459 (2.6)	538 (5.5)
Belgium (Flemish)	405 (6.9)	499 (3.6)	546 (2.6)	585 (3.5)	634 (4.9)
Botswana	251 (5.0)	321 (2.9)	373 (2.3)	423 (3.4)	492 (5.4)
Bulgaria	352 (8.5)	431 (4.9)	486 (5.2)	542 (5.2)	618 (5.8)
Chile	268 (3.8)	332 (3.2)	380 (3.3)	435 (4.7)	523 (5.2)
Chinese Taipei	411 (6.0)	520 (5.8)	595 (4.5)	656 (4.5)	731 (4.8)
Cyprus	347 (5.5)	418 (2.5)	469 (2.3)	515 (2.0)	574 (2.7)
Egypt	263 (8.8)	346 (4.6)	409 (3.5)	475 (4.5)	564 (4.4)
England	390 (6.8)	445 (5.8)	486 (4.9)	532 (7.3)	593 (6.9)
Estonia	434 (5.5)	495 (4.7)	538 (3.4)	581 (4.1)	641 (5.7)
Ghana	43 (5.2)	152 (4.9)	229 (5.8)	310 (8.9)	427 (8.7)
Hong Kong, SAR	467 (9.9)	549 (5.3)	594 (4.3)	636 (3.2)	689 (4.0)
Hungary	416 (4.8)	487 (4.5)	538 (3.3)	587 (2.7)	654 (4.9)
Indonesia	284 (8.2)	364 (6.3)	421 (4.8)	480 (4.9)	560 (4.3)
Iran, Islamic Rep. of	286 (2.9)	352 (2.1)	401 (2.7)	456 (3.4)	533 (3.0)
Israel	374 (4.8)	450 (4.2)	503 (3.8)	553 (3.1)	622 (6.0)
Italy	358 (5.0)	435 (3.6)	487 (3.0)	535 (3.3)	602 (7.5)
Japan	443 (3.2)	519 (3.8)	567 (2.1)	611 (1.7)	677 (6.6)
Jordan	273 (6.0)	364 (5.1)	429 (6.0)	494 (4.9)	580 (8.7)
Korea, Rep. of	444 (7.0)	539 (3.9)	599 (2.8)	650 (2.7)	717 (4.4)
Latvia	408 (4.9)	474 (4.4)	520 (3.2)	564 (3.0)	625 (5.2)
Lebanon	333 (6.0)	398 (3.8)	447 (3.9)	496 (4.5)	563 (4.2)
Lithuania	390 (6.4)	462 (3.3)	513 (3.7)	561 (3.2)	627 (4.0)
Macedonia, Rep. of	298 (8.8)	388 (4.3)	450 (5.6)	508 (3.6)	584 (5.8)
Malaysia	393 (5.8)	456 (3.8)	505 (4.8)	556 (5.1)	619 (5.0)
Moldova, Rep. of	325 (5.7)	411 (5.6)	471 (4.3)	525 (6.0)	593 (4.9)
Morocco	260 (8.1)	334 (4.9)	386 (4.9)	438 (4.5)	512 (8.4)
Netherlands	422 (3.8)	480 (4.3)	522 (4.3)	563 (3.3)	611 (5.4)
New Zealand	377 (7.7)	440 (3.7)	484 (4.7)	529 (7.9)	596 (14.3)
Norway	352 (3.4)	413 (2.2)	453 (2.5)	490 (2.5)	538 (2.3)
Palestinian Nat'l Auth.	228 (5.1)	320 (4.0)	390 (4.6)	462 (4.5)	554 (5.1)
Philippines	249 (4.7)	326 (3.6)	383 (6.0)	448 (6.9)	538 (7.4)
Romania	327 (8.6)	421 (6.4)	491 (7.1)	553 (5.3)	629 (7.0)
Russian Federation	395 (7.4)	469 (3.5)	520 (3.2)	570 (3.8)	640 (5.5)
Saudi Arabia	170 (8.7)	256 (5.8)	312 (5.7)	373 (4.9)	465 (9.0)
Scotland	377 (4.2)	441 (4.0)	483 (3.5)	524 (3.4)	575 (5.6)
Serbia	357 (4.4)	441 (3.1)	499 (4.3)	554 (2.8)	620 (3.5)
Singapore	461 (5.3)	546 (4.8)	598 (3.9)	642 (1.9)	696 (3.2)
Slovak Republic	388 (8.3)	467 (4.0)	519 (4.4)	569 (3.5)	637 (4.7)
Slovenia	391 (5.4)	455 (2.0)	499 (2.4)	543 (2.1)	606 (7.3)
South Africa	116 (4.1)	190 (3.2)	247 (4.3)	313 (7.1)	477 (22.1)
Sweden	392 (4.0)	450 (3.7)	487 (2.2)	523 (1.5)	575 (3.1)
Tunisia	290 (4.7)	351 (2.8)	396 (3.1)	444 (3.2)	517 (6.4)
United States	397 (3.2)	462 (3.6)	509 (3.2)	557 (3.3)	623 (3.9)
<b>Benchmarking Participants</b>					
Basque Country, Spain	395 (8.4)	456 (3.2)	497 (2.2)	536 (1.8)	589 (4.6)
Indiana State, US	415 (6.8)	473 (4.1)	514 (5.1)	556 (6.6)	618 (9.6)
Ontario Province, Can.	419 (5.4)	473 (3.7)	513 (2.4)	552 (3.0)	605 (4.2)
Quebec Province, Can.	452 (2.9)	500 (2.7)	537 (3.1)	574 (4.4)	624 (4.4)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

() Standard errors appear in parentheses.

## Exhibit D.1: Percentiles of Achievement in Knowing Cognitive Domain

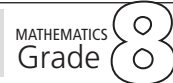
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Countries	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile
Armenia	296 (7.6)	387 (5.9)	447 (5.4)	507 (5.0)	597 (4.6)
Australia	363 (8.0)	449 (5.7)	505 (4.6)	554 (3.3)	631 (5.7)
Belgium (Flemish)	450 (3.4)	512 (2.3)	558 (2.3)	604 (3.7)	665 (2.9)
Chinese Taipei	443 (4.5)	518 (2.6)	566 (2.2)	614 (3.1)	681 (4.1)
Cyprus	351 (3.9)	443 (4.6)	503 (4.3)	560 (2.4)	641 (5.6)
England	378 (7.7)	472 (4.4)	536 (5.1)	599 (5.0)	687 (4.5)
Hong Kong, SAR	458 (4.5)	528 (3.6)	576 (3.6)	620 (4.0)	683 (3.7)
Hungary	382 (4.2)	464 (3.2)	520 (3.5)	572 (4.8)	644 (5.7)
Iran, Islamic Rep. of	275 (8.3)	351 (3.2)	403 (3.3)	457 (5.0)	533 (3.1)
Italy	365 (5.4)	456 (3.0)	514 (3.8)	573 (4.2)	660 (6.5)
Japan	424 (4.2)	512 (3.7)	566 (3.0)	620 (2.7)	696 (4.5)
Latvia	403 (6.6)	473 (4.0)	519 (2.8)	562 (2.9)	623 (5.2)
Lithuania	392 (5.0)	469 (3.6)	522 (2.9)	571 (3.1)	642 (4.7)
Moldova, Rep. of	337 (11.3)	437 (5.0)	504 (5.5)	566 (6.0)	654 (9.3)
Morocco	217 (5.2)	299 (6.2)	360 (4.6)	420 (5.0)	500 (7.4)
Netherlands	440 (3.5)	494 (2.9)	531 (2.4)	566 (1.9)	617 (3.1)
New Zealand	349 (5.1)	437 (3.5)	494 (3.0)	551 (2.7)	629 (4.3)
Norway	315 (4.6)	398 (2.8)	451 (2.6)	501 (3.2)	568 (4.2)
Philippines	231 (6.6)	315 (4.5)	378 (3.9)	449 (8.9)	559 (14.3)
Russian Federation	381 (5.9)	455 (5.8)	511 (6.7)	570 (5.1)	655 (8.1)
Scotland	356 (3.0)	434 (4.1)	485 (3.5)	535 (5.6)	605 (5.7)
Singapore	442 (12.5)	563 (9.2)	633 (7.4)	697 (7.2)	784 (6.7)
Slovenia	351 (5.4)	424 (3.4)	473 (2.3)	517 (3.8)	580 (3.3)
Tunisia	188 (7.8)	275 (5.3)	338 (6.0)	400 (5.6)	487 (3.5)
United States	396 (4.1)	474 (2.7)	529 (2.3)	584 (3.5)	657 (3.7)
<b>Benchmarking Participants</b>					
Indiana State, US	425 (5.8)	497 (6.0)	544 (4.5)	591 (3.8)	661 (7.9)
Ontario Province, Can.	392 (5.3)	465 (4.2)	513 (3.3)	562 (4.4)	635 (8.7)
Quebec Province, Can.	392 (5.0)	459 (2.9)	504 (3.6)	551 (3.5)	613 (7.6)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

( ) Standard errors appear in parentheses.

## Exhibit D.2: Percentiles of Achievement in Applying Cognitive Domain



Countries	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile
Armenia	326 (4.5)	421 (3.8)	483 (4.1)	541 (3.7)	607 (2.2)
Australia	365 (7.6)	452 (5.4)	510 (5.4)	567 (6.2)	645 (6.8)
Bahrain	272 (2.0)	345 (2.9)	398 (2.6)	451 (2.5)	522 (3.7)
Belgium (Flemish)	402 (6.2)	494 (3.3)	543 (3.0)	587 (3.3)	642 (3.6)
Botswana	256 (4.9)	320 (3.7)	367 (3.0)	416 (2.9)	486 (6.3)
Bulgaria	328 (6.4)	412 (7.6)	471 (3.7)	531 (5.0)	614 (7.0)
Chile	261 (4.9)	332 (3.5)	386 (3.6)	446 (5.5)	537 (7.0)
Chinese Taipei	400 (7.3)	513 (4.8)	594 (4.3)	655 (4.3)	733 (4.5)
Cyprus	309 (3.5)	396 (5.1)	461 (2.8)	521 (2.4)	595 (3.0)
Egypt	251 (5.9)	336 (3.7)	401 (5.0)	470 (3.7)	565 (5.9)
England	377 (6.9)	448 (6.1)	500 (6.4)	559 (7.0)	636 (8.3)
Estonia	412 (4.1)	481 (2.7)	527 (3.4)	576 (2.3)	646 (5.4)
Ghana	162 (4.6)	237 (4.9)	292 (4.1)	348 (6.6)	430 (13.0)
Hong Kong, SAR	448 (15.6)	544 (4.6)	591 (3.1)	634 (3.1)	690 (2.7)
Hungary	389 (8.7)	466 (4.2)	524 (4.2)	581 (4.0)	654 (7.0)
Indonesia	262 (6.0)	344 (6.9)	405 (5.7)	471 (6.3)	567 (7.1)
Iran, Islamic Rep. of	296 (3.8)	362 (2.7)	413 (2.9)	467 (3.5)	546 (5.5)
Israel	344 (6.4)	433 (5.9)	497 (4.1)	558 (3.9)	640 (5.3)
Italy	349 (6.1)	431 (3.1)	486 (3.2)	539 (3.2)	610 (5.6)
Japan	423 (3.2)	512 (3.1)	567 (2.5)	618 (2.5)	694 (7.5)
Jordan	274 (5.6)	360 (5.4)	422 (5.6)	484 (6.0)	568 (6.2)
Korea, Rep. of	434 (2.5)	531 (2.3)	591 (2.7)	643 (2.6)	711 (4.5)
Latvia	376 (4.7)	452 (3.5)	506 (3.5)	558 (5.8)	626 (4.8)
Lebanon	312 (3.6)	376 (2.9)	424 (4.0)	475 (4.9)	546 (4.4)
Lithuania	361 (3.3)	442 (3.9)	499 (3.9)	557 (3.9)	635 (4.2)
Macedonia, Rep. of	277 (5.8)	368 (6.7)	431 (3.9)	491 (4.3)	571 (12.6)
Malaysia	386 (5.2)	456 (4.1)	511 (6.1)	569 (4.6)	638 (6.5)
Moldova, Rep. of	321 (6.0)	402 (3.9)	462 (5.0)	516 (3.2)	582 (4.3)
Morocco	278 (3.8)	339 (2.5)	383 (2.7)	428 (3.4)	495 (5.7)
Netherlands	427 (7.1)	495 (6.0)	545 (4.9)	593 (5.3)	651 (4.4)
New Zealand	365 (8.2)	441 (6.8)	497 (5.2)	551 (6.5)	630 (7.1)
Norway	341 (6.6)	420 (4.2)	472 (2.6)	521 (2.7)	583 (4.4)
Palestinian Nat'l Auth.	242 (5.3)	325 (2.6)	387 (2.5)	453 (3.6)	538 (3.1)
Philippines	250 (5.1)	320 (5.9)	373 (4.9)	433 (6.8)	524 (11.3)
Romania	321 (7.7)	411 (4.5)	477 (5.5)	540 (6.6)	621 (6.6)
Russian Federation	371 (5.0)	448 (4.7)	504 (3.9)	560 (3.5)	634 (5.8)
Saudi Arabia	216 (8.5)	289 (5.2)	338 (4.1)	388 (4.7)	463 (4.7)
Scotland	373 (4.8)	455 (6.5)	509 (4.5)	560 (5.8)	624 (5.0)
Serbia	304 (4.1)	401 (4.7)	468 (3.8)	537 (4.2)	622 (2.4)
Singapore	461 (7.7)	562 (5.7)	621 (3.8)	669 (2.8)	725 (3.7)
Slovak Republic	359 (6.6)	443 (3.4)	502 (5.4)	562 (4.4)	645 (4.2)
Slovenia	370 (5.7)	440 (2.5)	491 (2.7)	542 (2.9)	614 (4.1)
South Africa	125 (4.1)	199 (3.2)	254 (4.6)	320 (7.4)	486 (23.7)
Sweden	374 (6.7)	455 (4.7)	507 (2.6)	557 (3.4)	627 (5.5)
Tunisia	321 (2.4)	376 (3.1)	416 (2.5)	459 (2.6)	526 (5.0)
United States	364 (4.2)	444 (3.4)	502 (4.4)	560 (3.5)	639 (4.6)
<b>Benchmarking Participants</b>					
Basque Country, Spain	370 (3.6)	437 (2.9)	483 (4.0)	528 (2.8)	588 (4.3)
Indiana State, US	382 (10.9)	456 (6.6)	506 (5.5)	559 (6.4)	634 (9.8)
Ontario Province, Can.	405 (3.2)	474 (3.9)	524 (3.5)	572 (3.5)	636 (3.1)
Quebec Province, Can.	450 (2.1)	504 (4.4)	544 (4.1)	585 (5.3)	640 (7.3)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

() Standard errors appear in parentheses.

## Exhibit D.2: Percentiles of Achievement in Applying Cognitive Domain

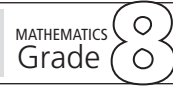
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Countries	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile
Armenia	326 (5.5)	407 (5.0)	461 (2.9)	516 (4.7)	598 (6.9)
Australia	350 (6.9)	434 (4.9)	491 (5.3)	545 (6.4)	626 (6.7)
Belgium (Flemish)	447 (4.6)	505 (1.7)	546 (2.4)	588 (1.9)	643 (4.0)
Chinese Taipei	458 (4.7)	523 (2.1)	563 (2.6)	602 (2.3)	656 (3.8)
Cyprus	365 (5.2)	455 (2.7)	512 (3.3)	568 (2.6)	647 (4.3)
England	370 (8.0)	463 (3.9)	527 (4.7)	591 (6.3)	677 (4.5)
Hong Kong, SAR	463 (5.1)	533 (3.9)	579 (2.4)	623 (3.8)	681 (3.6)
Hungary	396 (4.8)	478 (4.3)	533 (3.6)	586 (4.3)	655 (5.9)
Iran, Islamic Rep. of	261 (5.6)	336 (5.3)	391 (4.5)	444 (4.2)	519 (6.7)
Italy	355 (4.5)	438 (4.2)	494 (3.4)	549 (5.0)	631 (7.6)
Japan	430 (4.8)	513 (1.9)	567 (2.0)	622 (2.2)	697 (3.8)
Latvia	409 (5.8)	493 (4.0)	549 (2.9)	600 (4.2)	673 (4.5)
Lithuania	414 (6.1)	491 (4.0)	545 (3.2)	595 (2.6)	664 (4.1)
Moldova, Rep. of	355 (9.8)	448 (5.2)	510 (3.4)	569 (4.7)	647 (6.4)
Morocco	212 (7.8)	291 (5.8)	349 (5.5)	408 (4.5)	484 (5.3)
Netherlands	442 (8.2)	503 (2.7)	542 (2.4)	582 (3.6)	636 (3.3)
New Zealand	341 (3.6)	427 (5.0)	488 (1.3)	546 (2.3)	624 (7.6)
Norway	318 (4.7)	397 (3.3)	449 (2.6)	498 (3.2)	567 (2.4)
Philippines	211 (5.1)	292 (5.0)	356 (5.7)	427 (8.9)	542 (24.5)
Russian Federation	405 (7.8)	484 (6.2)	541 (4.9)	599 (4.5)	682 (5.5)
Scotland	355 (3.5)	433 (2.6)	488 (4.1)	541 (3.3)	617 (5.2)
Singapore	430 (12.1)	540 (7.3)	601 (6.5)	658 (6.1)	731 (6.3)
Slovenia	344 (5.3)	426 (3.5)	481 (5.4)	531 (4.0)	597 (5.7)
Tunisia	182 (6.9)	276 (6.2)	348 (7.6)	420 (5.9)	516 (6.3)
United States	378 (4.9)	451 (3.8)	506 (2.7)	560 (2.7)	631 (2.9)
<b>Benchmarking Participants</b>					
Indiana State, US	402 (6.7)	475 (4.5)	524 (3.5)	570 (4.5)	640 (5.9)
Ontario Province, Can.	378 (4.5)	449 (2.8)	497 (4.0)	546 (5.6)	621 (10.2)
Quebec Province, Can.	386 (3.6)	454 (2.6)	499 (3.0)	543 (4.5)	605 (4.2)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

( ) Standard errors appear in parentheses.

## Exhibit D.3: Percentiles of Achievement in Reasoning Cognitive Domain



Countries	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile
Armenia	293 (5.9)	402 (4.7)	472 (5.2)	541 (3.1)	622 (2.6)
Australia	375 (5.5)	461 (5.0)	520 (5.6)	572 (5.5)	642 (6.3)
Bahrain	297 (2.8)	374 (3.5)	426 (2.7)	477 (2.9)	545 (5.9)
Belgium (Flemish)	395 (5.5)	487 (3.7)	539 (2.3)	586 (3.3)	648 (3.3)
Botswana	204 (3.6)	292 (4.0)	353 (4.0)	415 (4.4)	502 (3.9)
Bulgaria	325 (6.8)	412 (4.4)	472 (5.2)	533 (4.7)	610 (5.4)
Chile	261 (5.5)	346 (5.0)	408 (4.0)	472 (4.3)	561 (4.2)
Chinese Taipei	414 (6.7)	514 (5.0)	581 (4.0)	642 (3.2)	721 (4.2)
Cyprus	308 (3.2)	399 (3.7)	458 (2.6)	516 (2.5)	593 (6.3)
Egypt	247 (6.8)	335 (3.4)	401 (3.4)	464 (5.2)	554 (5.6)
England	373 (5.9)	451 (6.6)	509 (6.5)	567 (6.5)	643 (7.4)
Estonia	399 (7.9)	472 (3.6)	524 (2.8)	574 (3.6)	643 (4.8)
Ghana	149 (4.7)	248 (4.0)	314 (5.5)	380 (5.9)	471 (5.4)
Hong Kong, SAR	436 (9.1)	522 (4.0)	574 (4.2)	621 (2.6)	684 (3.5)
Hungary	402 (6.0)	477 (3.6)	530 (3.0)	582 (4.7)	655 (6.9)
Indonesia	253 (7.5)	344 (5.5)	406 (6.1)	468 (4.7)	556 (7.6)
Iran, Islamic Rep. of	295 (5.0)	365 (3.2)	417 (2.9)	468 (2.7)	540 (2.4)
Israel	328 (4.1)	419 (4.1)	485 (5.4)	547 (3.8)	632 (5.4)
Italy	360 (8.1)	438 (4.1)	491 (3.2)	542 (3.3)	610 (5.4)
Japan	446 (7.1)	528 (3.1)	577 (1.5)	625 (3.3)	698 (5.1)
Jordan	295 (6.1)	377 (5.4)	435 (4.1)	490 (4.5)	566 (6.6)
Korea, Rep. of	441 (3.6)	530 (2.3)	585 (1.6)	638 (2.3)	712 (3.7)
Latvia	367 (6.4)	447 (4.2)	501 (3.4)	553 (3.7)	629 (5.7)
Lebanon	278 (6.9)	355 (3.1)	410 (3.4)	464 (3.7)	540 (4.4)
Lithuania	354 (5.1)	435 (4.3)	490 (2.6)	545 (2.7)	618 (3.2)
Macedonia, Rep. of	278 (8.3)	376 (4.5)	442 (4.9)	504 (5.6)	584 (4.6)
Malaysia	386 (2.9)	453 (2.8)	504 (4.9)	554 (4.1)	618 (3.9)
Moldova, Rep. of	309 (8.7)	395 (6.2)	456 (3.6)	513 (3.6)	590 (3.3)
Morocco	259 (7.4)	338 (4.2)	392 (3.2)	446 (4.5)	520 (8.2)
Netherlands	416 (6.2)	490 (4.8)	543 (4.0)	594 (5.3)	660 (8.3)
New Zealand	374 (5.2)	455 (5.5)	513 (6.8)	565 (8.1)	639 (7.0)
Norway	343 (6.0)	427 (3.6)	483 (3.0)	534 (2.7)	604 (3.3)
Palestinian Nat'l Auth.	259 (6.1)	346 (3.3)	405 (3.9)	465 (2.7)	545 (5.6)
Philippines	177 (6.1)	282 (5.4)	355 (7.4)	433 (6.2)	542 (8.0)
Romania	297 (8.7)	395 (4.6)	461 (5.1)	523 (5.5)	611 (4.8)
Russian Federation	365 (8.9)	443 (4.7)	497 (3.8)	551 (4.4)	623 (3.4)
Saudi Arabia	205 (7.9)	289 (6.1)	349 (3.9)	407 (3.7)	489 (6.5)
Scotland	375 (7.9)	459 (4.0)	518 (3.9)	570 (4.1)	638 (8.5)
Serbia	323 (6.0)	411 (3.4)	471 (3.5)	527 (2.7)	604 (5.5)
Singapore	424 (5.6)	528 (4.8)	591 (3.2)	645 (2.9)	717 (3.7)
Slovak Republic	360 (5.5)	450 (7.2)	506 (4.9)	560 (3.9)	636 (4.4)
Slovenia	372 (4.7)	445 (2.8)	495 (3.3)	543 (1.9)	610 (3.8)
South Africa	111 (8.0)	207 (3.6)	277 (3.4)	354 (7.1)	505 (13.7)
Sweden	364 (9.3)	453 (4.0)	510 (2.9)	567 (3.3)	642 (5.9)
Tunisia	282 (4.9)	351 (3.0)	400 (3.3)	447 (2.4)	516 (7.7)
United States	366 (5.0)	448 (4.1)	507 (4.8)	564 (2.9)	638 (4.5)
<b>Benchmarking Participants</b>					
Basque Country, Spain	371 (7.9)	446 (3.1)	496 (2.3)	545 (1.9)	610 (2.1)
Indiana State, US	376 (10.4)	451 (5.0)	502 (4.7)	555 (5.9)	627 (8.7)
Ontario Province, Can.	403 (9.6)	479 (3.6)	531 (3.8)	577 (3.5)	641 (4.8)
Quebec Province, Can.	429 (6.3)	494 (3.5)	540 (2.8)	583 (2.9)	646 (11.0)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

( ) Standard errors appear in parentheses.

## Exhibit D.3: Percentiles of Achievement in Reasoning Cognitive Domain

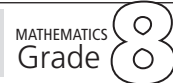
MATHEMATICS  
Grade 4

Countries	5th Percentile	25th Percentile	50th Percentile	75th Percentile	95th Percentile
Armenia	305 (4.4)	387 (3.9)	445 (2.8)	503 (3.9)	588 (4.7)
Australia	373 (5.5)	455 (5.4)	510 (4.9)	561 (3.4)	633 (5.5)
Belgium (Flemish)	421 (4.3)	494 (3.3)	542 (3.0)	591 (3.5)	659 (4.3)
Chinese Taipei	422 (7.8)	513 (3.4)	568 (2.9)	618 (2.0)	691 (5.9)
Cyprus	369 (4.5)	460 (3.2)	519 (2.6)	574 (3.3)	653 (4.4)
England	390 (8.1)	479 (4.6)	539 (3.3)	598 (4.0)	678 (4.9)
Hong Kong, SAR	427 (6.4)	514 (4.4)	568 (4.4)	618 (3.0)	689 (3.9)
Hungary	379 (5.6)	467 (4.7)	528 (2.9)	584 (4.0)	661 (4.3)
Iran, Islamic Rep. of	267 (9.9)	346 (4.5)	400 (4.2)	455 (3.4)	531 (3.9)
Italy	356 (4.7)	441 (3.0)	499 (3.4)	556 (3.7)	644 (6.0)
Japan	423 (7.2)	508 (1.6)	563 (2.9)	618 (3.5)	694 (4.4)
Latvia	393 (7.5)	476 (2.7)	533 (2.6)	588 (3.6)	664 (5.2)
Lithuania	381 (4.9)	469 (3.5)	530 (3.5)	586 (4.1)	662 (5.9)
Moldova, Rep. of	341 (9.7)	436 (4.7)	498 (6.1)	556 (5.5)	636 (5.9)
Morocco	235 (5.7)	314 (5.3)	368 (4.5)	423 (6.5)	502 (6.2)
Netherlands	422 (4.8)	492 (3.2)	536 (5.3)	580 (4.2)	643 (3.4)
New Zealand	360 (3.7)	448 (2.4)	507 (3.4)	561 (3.3)	637 (5.3)
Norway	322 (5.5)	409 (2.4)	471 (2.0)	527 (5.1)	608 (3.5)
Philippines	201 (6.9)	287 (4.5)	352 (6.5)	425 (10.1)	544 (18.4)
Russian Federation	386 (6.3)	468 (5.1)	526 (4.9)	585 (5.0)	665 (4.5)
Scotland	366 (7.2)	448 (4.3)	500 (3.7)	551 (4.1)	623 (7.1)
Singapore	403 (10.9)	516 (7.7)	579 (5.3)	640 (8.3)	722 (5.3)
Slovenia	339 (8.7)	429 (3.7)	488 (3.2)	543 (4.7)	619 (4.3)
Tunisia	179 (8.5)	273 (3.8)	339 (5.2)	406 (4.8)	504 (6.2)
United States	388 (3.4)	466 (3.8)	520 (2.5)	574 (2.6)	647 (2.9)
<b>Benchmarking Participants</b>					
Indiana State, US	416 (4.1)	484 (3.1)	529 (2.8)	573 (4.8)	639 (9.0)
Ontario Province, Can.	406 (4.4)	476 (4.1)	523 (3.8)	571 (5.2)	637 (8.0)
Quebec Province, Can.	389 (4.9)	464 (4.2)	514 (2.3)	562 (2.6)	629 (3.9)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

( ) Standard errors appear in parentheses.

## Exhibit D.4: Standard Deviations of Achievement in Knowing Cognitive Domain



Countries	Overall		Girls		Boys	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Armenia	480 (2.9)	77 (1.3)	486 (3.2)	74 (1.3)	474 (3.4)	79 (1.8)
Australia	497 (4.0)	69 (2.6)	491 (5.1)	66 (2.3)	502 (5.2)	72 (3.8)
Bahrain	401 (2.3)	83 (1.3)	419 (2.8)	77 (1.7)	383 (3.2)	85 (1.9)
Belgium (Flemish)	537 (2.5)	68 (2.2)	534 (3.4)	68 (3.0)	541 (3.6)	69 (2.5)
Botswana	372 (2.8)	73 (1.7)	374 (3.0)	72 (1.7)	370 (3.6)	75 (2.1)
Bulgaria	486 (4.1)	81 (2.4)	487 (5.0)	80 (3.0)	484 (4.3)	81 (2.9)
Chile	386 (3.2)	77 (1.6)	378 (3.5)	74 (1.7)	393 (4.1)	79 (2.2)
Chinese Taipei	585 (4.5)	98 (2.0)	589 (5.0)	92 (2.1)	582 (5.0)	103 (2.4)
Cyprus	466 (2.0)	70 (0.8)	474 (2.1)	67 (1.4)	458 (2.6)	71 (1.2)
Egypt	411 (3.4)	92 (1.5)	413 (4.1)	89 (1.5)	409 (4.8)	94 (2.3)
England	489 (4.0)	62 (2.7)	488 (4.5)	61 (2.6)	489 (5.2)	63 (3.5)
Estonia	538 (2.7)	63 (1.4)	538 (3.2)	63 (1.6)	538 (3.0)	63 (1.6)
Ghana	232 (5.9)	114 (2.7)	220 (7.0)	111 (3.1)	243 (6.4)	115 (3.0)
Hong Kong, SAR	589 (3.3)	67 (3.0)	591 (3.7)	66 (3.0)	587 (4.6)	69 (3.5)
Hungary	536 (3.1)	73 (1.7)	537 (3.6)	72 (2.0)	536 (3.4)	74 (2.1)
Indonesia	422 (4.3)	84 (2.2)	423 (4.5)	84 (2.8)	421 (4.6)	84 (2.2)
Iran, Islamic Rep. of	405 (2.6)	76 (1.2)	412 (4.8)	74 (1.8)	401 (4.2)	77 (2.5)
Israel	501 (3.1)	76 (1.7)	499 (3.3)	72 (1.7)	503 (4.0)	79 (2.3)
Italy	484 (3.2)	74 (2.2)	483 (3.2)	72 (2.5)	485 (3.8)	76 (2.4)
Japan	564 (1.9)	71 (1.3)	564 (3.8)	68 (3.7)	564 (3.4)	74 (2.3)
Jordan	428 (4.7)	94 (2.1)	442 (5.5)	91 (2.8)	415 (6.2)	94 (2.5)
Korea, Rep. of	592 (2.1)	83 (1.6)	589 (2.9)	81 (1.7)	594 (2.4)	85 (1.8)
Latvia	518 (2.8)	66 (1.4)	523 (2.9)	63 (1.6)	514 (3.4)	68 (1.9)
Lebanon	447 (3.2)	70 (1.5)	444 (3.6)	70 (1.6)	452 (3.9)	71 (2.1)
Lithuania	511 (2.7)	72 (1.4)	514 (3.5)	71 (1.8)	507 (2.9)	75 (1.7)
Macedonia, Rep. of	447 (3.8)	87 (2.4)	452 (4.1)	85 (2.5)	442 (4.2)	88 (2.8)
Malaysia	506 (3.9)	70 (2.1)	511 (4.4)	68 (2.5)	501 (4.4)	71 (2.4)
Moldova, Rep. of	466 (4.1)	81 (1.9)	472 (4.9)	80 (2.2)	460 (4.6)	82 (2.2)
Morocco	386 (2.8)	76 (1.5)	383 (3.7)	76 (2.1)	392 (4.2)	76 (2.6)
Netherlands	520 (3.1)	58 (2.4)	518 (3.5)	58 (2.5)	522 (3.6)	59 (2.6)
New Zealand	485 (4.8)	66 (3.0)	484 (4.3)	63 (2.8)	486 (6.5)	69 (3.6)
Norway	450 (2.1)	57 (1.3)	451 (2.5)	55 (1.6)	449 (3.0)	58 (1.6)
Palestinian Nat'l Auth.	391 (3.7)	100 (1.6)	398 (4.8)	98 (2.2)	382 (5.6)	100 (2.3)
Philippines	388 (5.2)	88 (2.5)	395 (5.2)	87 (2.5)	379 (6.1)	90 (3.4)
Romania	485 (4.9)	92 (1.9)	489 (5.3)	91 (2.0)	481 (5.2)	94 (2.4)
Russian Federation	519 (3.4)	74 (1.3)	525 (3.5)	72 (1.5)	514 (3.7)	77 (1.6)
Saudi Arabia	315 (4.6)	89 (2.1)	309 (6.9)	85 (4.0)	319 (6.2)	91 (2.5)
Scotland	481 (3.2)	60 (1.7)	483 (3.9)	58 (2.2)	478 (3.4)	61 (1.7)
Serbia	495 (2.7)	80 (1.6)	502 (3.1)	77 (1.9)	489 (3.1)	83 (1.7)
Singapore	591 (3.1)	71 (2.1)	596 (2.9)	68 (2.5)	586 (3.7)	74 (2.2)
Slovak Republic	517 (3.3)	75 (1.7)	521 (3.4)	72 (2.0)	514 (3.9)	78 (2.0)
Slovenia	499 (2.2)	65 (1.4)	502 (2.6)	62 (1.6)	495 (2.9)	68 (1.7)
South Africa	261 (5.4)	106 (5.3)	260 (6.1)	104 (6.1)	261 (6.3)	109 (6.0)
Sweden	486 (2.1)	55 (1.3)	486 (2.5)	54 (1.6)	486 (2.3)	56 (1.5)
Tunisia	399 (3.0)	69 (1.4)	388 (3.6)	69 (1.8)	410 (3.0)	66 (1.5)
United States	510 (2.8)	69 (1.4)	508 (3.0)	67 (1.5)	512 (3.0)	71 (1.6)
<b>Benchmarking Participants</b>						
Basque Country, Spain	495 (2.2)	59 (1.2)	498 (2.2)	55 (1.1)	492 (3.0)	62 (2.0)
Indiana State, US	515 (4.6)	61 (2.7)	512 (4.7)	60 (2.7)	518 (5.2)	63 (2.9)
Ontario Province, Can.	513 (2.6)	57 (1.4)	512 (2.9)	57 (1.7)	513 (3.1)	57 (1.6)
Quebec Province, Can.	537 (2.7)	53 (1.5)	535 (3.3)	52 (1.7)	540 (3.1)	54 (1.8)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

( ) Standard errors appear in parentheses.



## Exhibit D.4: Standard Deviations of Achievement in Knowing Cognitive Domain

 MATHEMATICS  
Grade 4

Countries	Overall		Girls		Boys	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Armenia	447 (3.7)	91 (2.2)	455 (3.7)	88 (2.1)	439 (4.3)	93 (2.7)
Australia	501 (3.8)	81 (2.2)	501 (4.1)	79 (2.3)	502 (4.6)	83 (3.0)
Belgium (Flemish)	558 (2.1)	66 (1.1)	556 (2.6)	65 (1.3)	560 (2.9)	68 (1.5)
Chinese Taipei	565 (2.2)	72 (1.4)	564 (2.4)	68 (1.8)	566 (2.6)	76 (1.6)
Cyprus	500 (2.8)	88 (1.3)	496 (3.1)	86 (1.8)	504 (3.6)	89 (1.5)
England	534 (4.5)	93 (2.1)	534 (4.4)	90 (2.4)	534 (5.3)	96 (2.5)
Hong Kong, SAR	574 (3.3)	69 (1.3)	574 (3.9)	65 (1.3)	573 (3.6)	72 (2.0)
Hungary	517 (3.3)	80 (2.0)	516 (4.1)	78 (2.6)	518 (3.6)	81 (2.1)
Iran, Islamic Rep. of	404 (4.0)	78 (2.0)	411 (6.6)	78 (3.3)	399 (4.5)	78 (1.9)
Italy	514 (3.9)	89 (2.1)	510 (4.3)	88 (2.8)	518 (4.1)	90 (2.0)
Japan	564 (2.1)	82 (1.1)	565 (2.6)	78 (1.4)	564 (3.0)	86 (1.4)
Latvia	517 (2.9)	67 (1.5)	518 (3.1)	64 (1.5)	515 (3.5)	70 (2.3)
Lithuania	519 (2.7)	75 (1.3)	522 (3.3)	74 (1.9)	520 (3.6)	77 (1.4)
Moldova, Rep. of	500 (5.2)	97 (3.2)	507 (5.9)	96 (3.9)	495 (5.3)	97 (3.2)
Morocco	360 (4.4)	87 (1.5)	356 (5.6)	88 (1.9)	363 (4.3)	86 (2.2)
Netherlands	530 (2.2)	54 (1.4)	527 (3.0)	54 (1.7)	533 (2.6)	54 (1.8)
New Zealand	493 (2.2)	84 (2.2)	494 (2.9)	83 (2.6)	492 (2.5)	85 (2.4)
Norway	448 (2.1)	77 (1.2)	447 (2.5)	75 (1.6)	449 (3.1)	80 (1.6)
Philippines	385 (6.9)	99 (5.3)	389 (8.0)	100 (6.1)	380 (6.3)	98 (4.6)
Russian Federation	513 (5.3)	83 (2.1)	513 (5.8)	83 (2.5)	514 (5.8)	84 (2.4)
Scotland	484 (3.0)	76 (1.8)	478 (3.1)	72 (2.2)	489 (4.2)	79 (1.9)
Singapore	626 (6.5)	104 (3.2)	632 (6.4)	98 (2.9)	620 (7.2)	108 (3.7)
Slovenia	470 (2.6)	70 (1.4)	469 (3.1)	67 (1.7)	471 (3.3)	72 (1.8)
Tunisia	338 (4.2)	91 (2.2)	337 (4.8)	90 (2.4)	338 (4.6)	91 (2.5)
United States	528 (2.5)	79 (1.3)	525 (2.4)	77 (1.4)	532 (3.0)	81 (1.6)
<b>Benchmarking Participants</b>						
Indiana State, US	544 (3.7)	72 (1.9)	541 (4.4)	69 (2.2)	546 (4.3)	75 (2.3)
Ontario Province, Can.	514 (4.4)	73 (2.8)	508 (4.4)	70 (2.7)	519 (5.7)	76 (3.6)
Quebec Province, Can.	504 (2.8)	67 (1.5)	501 (3.2)	67 (1.9)	508 (2.9)	68 (1.6)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

() Standard errors appear in parentheses.

**Exhibit D.5: Standard Deviations of Achievement in Applying Cognitive Domain**

Countries	Overall		Girls		Boys	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Armenia	478 (3.0)	86 (1.5)	482 (3.5)	83 (1.8)	473 (3.5)	88 (2.0)
Australia	508 (4.8)	86 (3.0)	501 (6.1)	82 (3.0)	516 (6.0)	88 (4.2)
Bahrain	398 (1.6)	76 (1.2)	411 (2.3)	71 (1.1)	384 (2.3)	79 (1.7)
Belgium (Flemish)	536 (2.7)	72 (2.2)	529 (3.3)	71 (2.8)	544 (3.7)	73 (2.6)
Botswana	369 (2.7)	71 (1.7)	370 (3.0)	70 (2.0)	368 (2.9)	71 (1.7)
Bulgaria	471 (4.7)	87 (2.7)	471 (6.0)	87 (3.5)	472 (4.9)	87 (3.0)
Chile	391 (3.3)	84 (1.8)	382 (3.6)	81 (1.8)	399 (4.2)	86 (2.4)
Chinese Taipei	582 (4.6)	101 (1.8)	584 (5.1)	96 (1.9)	580 (5.1)	107 (2.4)
Cyprus	457 (1.6)	88 (1.3)	465 (1.9)	85 (1.5)	450 (2.5)	90 (1.8)
Egypt	404 (3.4)	96 (1.5)	401 (4.3)	93 (1.7)	406 (4.9)	98 (2.2)
England	503 (4.8)	79 (3.1)	503 (5.4)	78 (2.9)	504 (6.0)	80 (4.2)
Estonia	528 (2.9)	71 (1.4)	531 (3.3)	71 (1.7)	526 (3.2)	71 (1.8)
Ghana	293 (4.0)	82 (2.0)	286 (4.9)	79 (2.2)	299 (4.8)	83 (2.3)
Hong Kong, SAR	584 (3.2)	73 (3.1)	584 (3.7)	70 (3.0)	584 (4.5)	75 (3.8)
Hungary	523 (3.4)	82 (2.0)	517 (3.8)	80 (2.2)	529 (4.0)	83 (2.4)
Indonesia	408 (4.9)	93 (2.5)	408 (5.0)	92 (3.1)	409 (5.3)	93 (2.5)
Iran, Islamic Rep. of	416 (2.5)	77 (1.4)	420 (4.6)	74 (2.0)	413 (4.1)	78 (2.7)
Israel	495 (3.6)	91 (2.0)	490 (3.7)	87 (2.4)	500 (4.6)	94 (2.4)
Italy	484 (3.2)	79 (1.9)	479 (3.0)	76 (2.1)	488 (4.0)	82 (2.4)
Japan	564 (2.2)	82 (1.6)	563 (4.4)	78 (4.4)	565 (3.6)	85 (2.2)
Jordan	422 (4.2)	89 (2.0)	436 (4.9)	86 (2.7)	409 (5.8)	90 (2.2)
Korea, Rep. of	584 (2.2)	84 (1.4)	581 (2.9)	82 (1.6)	587 (2.3)	86 (1.6)
Latvia	504 (3.4)	76 (1.9)	505 (3.5)	74 (2.4)	504 (4.1)	79 (2.5)
Lebanon	426 (3.3)	71 (1.6)	422 (3.7)	70 (1.6)	432 (4.2)	72 (2.4)
Lithuania	499 (2.8)	84 (1.5)	499 (3.2)	82 (2.1)	497 (3.3)	87 (1.8)
Macedonia, Rep. of	428 (3.8)	89 (2.5)	431 (4.2)	87 (2.8)	426 (4.3)	91 (2.8)
Malaysia	512 (4.4)	78 (2.2)	515 (5.1)	76 (2.7)	508 (4.8)	79 (2.5)
Moldova, Rep. of	457 (3.9)	80 (2.0)	462 (4.0)	77 (2.4)	453 (4.5)	82 (2.3)
Morocco	384 (2.9)	66 (1.4)	377 (3.4)	66 (1.9)	393 (3.3)	65 (2.0)
Netherlands	543 (3.7)	69 (2.7)	538 (4.0)	68 (2.8)	548 (4.3)	69 (3.1)
New Zealand	497 (5.3)	80 (3.2)	496 (4.7)	77 (2.9)	497 (7.2)	83 (3.7)
Norway	468 (2.7)	74 (1.4)	469 (2.8)	72 (1.5)	468 (3.4)	76 (2.0)
Palestinian Nat'l Auth.	388 (3.2)	91 (1.6)	389 (4.1)	91 (2.0)	388 (4.6)	91 (2.2)
Philippines	378 (4.8)	83 (2.8)	383 (4.8)	82 (2.8)	373 (5.5)	85 (3.6)
Romania	475 (5.0)	91 (1.8)	475 (5.4)	90 (2.1)	474 (5.3)	93 (2.3)
Russian Federation	503 (3.7)	80 (1.6)	503 (3.8)	78 (1.8)	503 (4.1)	82 (2.2)
Saudi Arabia	338 (3.6)	75 (2.2)	332 (6.1)	72 (3.2)	344 (4.5)	76 (2.5)
Scotland	505 (3.9)	76 (2.2)	506 (4.8)	74 (2.8)	504 (3.8)	79 (2.3)
Serbia	467 (2.9)	97 (1.5)	468 (3.5)	94 (2.1)	466 (3.1)	100 (1.6)
Singapore	611 (3.6)	80 (2.5)	617 (3.6)	76 (2.8)	606 (4.1)	83 (2.6)
Slovak Republic	502 (3.7)	87 (1.8)	499 (4.0)	84 (2.0)	505 (4.3)	90 (2.2)
Slovenia	491 (2.3)	74 (1.1)	491 (3.0)	71 (1.6)	491 (2.8)	77 (1.5)
South Africa	269 (5.3)	106 (5.1)	267 (5.9)	103 (5.8)	271 (6.5)	109 (5.9)
Sweden	505 (2.8)	76 (1.6)	504 (3.2)	75 (1.8)	506 (2.8)	77 (2.0)
Tunisia	419 (2.3)	62 (1.3)	407 (2.6)	61 (1.7)	433 (2.4)	60 (1.3)
United States	502 (3.4)	83 (1.6)	497 (3.5)	81 (1.8)	506 (3.5)	85 (1.7)
<b>Benchmarking Participants</b>						
Basque Country, Spain	481 (2.3)	66 (1.5)	483 (2.5)	62 (1.5)	480 (3.2)	70 (2.2)
Indiana State, US	507 (5.9)	76 (3.0)	498 (5.7)	73 (3.2)	516 (6.7)	78 (3.6)
Ontario Province, Can.	522 (3.0)	70 (1.1)	520 (3.3)	68 (1.5)	525 (3.5)	71 (1.5)
Quebec Province, Can.	545 (3.0)	58 (1.7)	539 (3.6)	57 (1.8)	549 (3.4)	59 (2.0)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

() Standard errors appear in parentheses.

## Exhibit D.5: Standard Deviations of Achievement in Applying Cognitive Domain

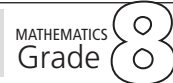
 MATHEMATICS  
 Grade 4

Countries	Overall		Girls		Boys	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Armenia	462 (3.2)	82 (1.9)	465 (3.2)	80 (2.0)	459 (3.7)	84 (2.2)
Australia	490 (3.8)	83 (2.0)	487 (4.3)	81 (2.2)	492 (4.4)	86 (2.5)
Belgium (Flemish)	546 (2.1)	60 (1.1)	544 (2.5)	59 (1.3)	548 (2.7)	62 (1.4)
Chinese Taipei	561 (1.9)	60 (0.9)	561 (2.0)	56 (1.0)	562 (2.2)	64 (1.2)
Cyprus	510 (2.8)	86 (1.5)	504 (3.1)	83 (1.6)	516 (2.9)	88 (1.9)
England	526 (4.1)	93 (2.0)	524 (4.1)	90 (2.3)	528 (4.9)	96 (2.5)
Hong Kong, SAR	577 (3.3)	66 (1.2)	576 (3.5)	63 (1.4)	577 (3.5)	69 (1.7)
Hungary	530 (3.4)	79 (2.2)	530 (4.0)	78 (2.6)	531 (3.7)	79 (2.5)
Iran, Islamic Rep. of	391 (3.8)	78 (1.7)	391 (6.1)	77 (2.7)	391 (4.8)	80 (1.9)
Italy	494 (3.6)	83 (1.9)	489 (4.3)	82 (2.6)	498 (3.5)	84 (1.7)
Japan	566 (2.1)	81 (1.5)	563 (2.6)	77 (1.8)	569 (2.3)	85 (1.8)
Latvia	545 (3.3)	80 (1.7)	545 (3.4)	77 (2.1)	546 (4.0)	83 (2.7)
Lithuania	542 (2.9)	76 (1.5)	541 (3.7)	75 (2.3)	545 (3.7)	79 (1.7)
Moldova, Rep. of	507 (4.8)	90 (3.0)	511 (5.3)	89 (3.7)	502 (5.0)	90 (3.0)
Morocco	349 (4.5)	83 (1.8)	345 (5.6)	83 (2.2)	352 (4.4)	83 (1.9)
Netherlands	541 (2.6)	60 (1.3)	538 (2.8)	61 (2.0)	545 (3.2)	58 (1.8)
New Zealand	486 (2.3)	86 (1.9)	485 (3.0)	85 (2.5)	486 (2.5)	87 (1.8)
Norway	446 (2.2)	76 (1.5)	443 (2.8)	73 (1.5)	449 (3.0)	78 (2.1)
Philippines	364 (7.5)	101 (6.3)	370 (8.8)	101 (6.8)	357 (6.7)	100 (5.9)
Russian Federation	542 (4.7)	84 (2.0)	539 (5.0)	83 (2.3)	545 (5.1)	85 (2.5)
Scotland	487 (3.5)	80 (1.5)	482 (3.6)	76 (1.8)	492 (4.6)	84 (1.9)
Singapore	595 (5.9)	90 (3.3)	599 (5.8)	86 (3.0)	590 (6.6)	94 (3.8)
Slovenia	477 (2.8)	77 (1.6)	474 (3.1)	74 (1.9)	481 (3.8)	80 (2.3)
Tunisia	348 (4.6)	102 (2.3)	351 (5.1)	102 (2.5)	346 (4.7)	102 (2.6)
United States	505 (2.6)	77 (1.3)	501 (2.8)	75 (1.2)	510 (2.9)	80 (1.7)
<b>Benchmarking Participants</b>						
Indiana State, US	523 (3.3)	72 (2.5)	521 (3.4)	68 (2.5)	525 (4.2)	76 (2.9)
Ontario Province, Can.	498 (4.5)	74 (3.4)	491 (3.8)	70 (2.5)	505 (5.8)	76 (4.4)
Quebec Province, Can.	498 (2.7)	66 (1.2)	493 (3.2)	65 (1.7)	503 (2.9)	67 (1.4)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

() Standard errors appear in parentheses.

## Exhibit D.6: Standard Deviations of Achievement in Reasoning Cognitive Domain



Countries	Overall		Girls		Boys	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Armenia	468 (2.8)	100 (2.0)	473 (3.4)	98 (1.9)	463 (4.3)	103 (2.5)
Australia	515 (4.0)	82 (2.4)	515 (5.1)	80 (2.5)	516 (5.1)	84 (3.4)
Bahrain	424 (2.2)	76 (1.3)	435 (2.5)	71 (1.7)	412 (3.2)	79 (1.6)
Belgium (Flemish)	533 (2.8)	76 (2.2)	531 (3.8)	75 (2.8)	536 (3.6)	77 (2.6)
Botswana	353 (3.7)	91 (1.5)	356 (3.5)	90 (1.8)	351 (4.5)	92 (1.9)
Bulgaria	471 (3.9)	88 (2.5)	471 (5.2)	86 (2.9)	471 (4.4)	89 (2.9)
Chile	409 (3.5)	91 (1.6)	406 (4.1)	90 (2.0)	412 (4.2)	92 (1.9)
Chinese Taipei	576 (4.2)	93 (1.9)	581 (4.3)	88 (2.0)	572 (4.8)	97 (2.3)
Cyprus	455 (1.7)	87 (1.5)	465 (2.3)	83 (2.3)	446 (2.4)	90 (1.7)
Egypt	400 (3.6)	94 (1.5)	402 (4.5)	92 (1.7)	399 (5.1)	95 (2.1)
England	509 (4.7)	82 (2.9)	513 (4.8)	80 (2.5)	506 (5.9)	85 (3.8)
Estonia	523 (3.0)	75 (1.7)	526 (3.4)	75 (2.0)	519 (3.4)	74 (2.1)
Ghana	313 (4.0)	97 (1.5)	309 (4.6)	97 (2.4)	317 (5.0)	97 (1.8)
Hong Kong, SAR	569 (3.1)	76 (2.6)	571 (3.5)	73 (2.5)	567 (4.4)	78 (3.4)
Hungary	529 (3.1)	77 (1.7)	530 (3.7)	76 (2.1)	528 (3.5)	79 (2.1)
Indonesia	406 (4.3)	92 (2.3)	405 (4.4)	91 (3.0)	406 (4.8)	94 (2.2)
Iran, Islamic Rep. of	417 (2.8)	75 (1.3)	423 (3.8)	72 (1.7)	413 (4.4)	77 (2.1)
Israel	483 (3.3)	92 (1.8)	483 (3.4)	89 (2.6)	483 (4.6)	96 (2.9)
Italy	489 (2.9)	76 (1.7)	486 (3.0)	74 (1.9)	491 (3.4)	78 (2.1)
Japan	576 (1.8)	76 (1.3)	575 (3.7)	72 (3.0)	576 (3.0)	80 (2.0)
Jordan	433 (3.7)	83 (1.8)	442 (4.1)	81 (2.3)	425 (5.3)	83 (2.2)
Korea, Rep. of	582 (1.7)	82 (1.1)	580 (2.4)	79 (1.6)	584 (2.1)	85 (1.3)
Latvia	500 (3.4)	80 (1.8)	504 (3.6)	76 (1.7)	496 (4.4)	83 (2.6)
Lebanon	410 (3.0)	80 (2.1)	407 (3.5)	79 (2.1)	413 (4.9)	81 (2.8)
Lithuania	489 (2.6)	81 (1.3)	492 (3.0)	79 (1.6)	484 (3.3)	84 (2.1)
Macedonia, Rep. of	438 (3.7)	93 (2.3)	444 (4.1)	90 (2.8)	432 (4.7)	95 (2.5)
Malaysia	503 (3.4)	71 (1.5)	505 (3.9)	70 (1.9)	501 (3.9)	73 (1.7)
Moldova, Rep. of	453 (4.0)	86 (2.4)	458 (4.2)	85 (2.7)	448 (4.6)	86 (3.3)
Morocco	391 (3.2)	80 (2.0)	387 (3.9)	80 (2.0)	397 (4.0)	80 (2.8)
Netherlands	541 (3.8)	74 (2.5)	540 (4.3)	74 (2.5)	542 (4.5)	76 (2.8)
New Zealand	509 (5.2)	81 (2.5)	519 (5.4)	76 (2.9)	499 (6.7)	85 (2.9)
Norway	479 (2.8)	80 (1.7)	486 (3.1)	78 (1.9)	472 (3.5)	81 (2.1)
Palestinian Nat'l Auth.	404 (2.7)	87 (1.6)	410 (3.8)	84 (1.8)	397 (4.2)	89 (2.3)
Philippines	358 (5.8)	110 (2.4)	363 (5.9)	109 (2.5)	350 (6.4)	112 (3.4)
Romania	458 (4.5)	95 (2.0)	460 (5.0)	92 (2.8)	456 (5.0)	98 (2.3)
Russian Federation	496 (3.6)	79 (1.9)	498 (4.0)	77 (2.3)	494 (3.8)	81 (2.0)
Saudi Arabia	348 (4.3)	87 (2.7)	347 (5.7)	82 (2.8)	349 (6.1)	90 (3.9)
Scotland	513 (3.4)	81 (2.1)	517 (4.3)	79 (2.4)	509 (3.4)	82 (2.7)
Serbia	468 (2.6)	86 (1.0)	472 (3.3)	83 (1.5)	464 (2.8)	87 (1.3)
Singapore	583 (3.5)	88 (2.2)	589 (3.3)	84 (2.7)	579 (4.4)	92 (2.5)
Slovak Republic	504 (3.2)	83 (2.0)	505 (3.3)	80 (1.8)	503 (4.2)	87 (2.6)
Slovenia	494 (2.5)	72 (1.3)	500 (3.1)	68 (1.9)	488 (3.2)	76 (1.6)
South Africa	287 (5.0)	118 (4.0)	287 (5.6)	116 (4.6)	286 (5.7)	121 (4.9)
Sweden	508 (3.3)	84 (1.9)	511 (4.1)	83 (2.2)	505 (3.3)	86 (2.6)
Tunisia	399 (2.7)	71 (1.1)	390 (3.3)	71 (1.6)	410 (3.3)	69 (1.6)
United States	505 (3.3)	83 (1.5)	505 (3.3)	81 (1.7)	506 (3.7)	85 (1.8)
<b>Benchmarking Participants</b>						
Basque Country, Spain	494 (2.4)	73 (1.5)	500 (2.8)	68 (1.6)	488 (3.8)	77 (2.4)
Indiana State, US	503 (5.2)	77 (3.0)	502 (4.6)	74 (2.6)	503 (6.5)	79 (3.7)
Ontario Province, Can.	527 (3.0)	72 (1.5)	527 (3.8)	71 (2.0)	528 (3.6)	73 (1.8)
Quebec Province, Can.	539 (3.2)	66 (1.7)	537 (3.7)	64 (2.2)	540 (3.9)	67 (1.6)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

() Standard errors appear in parentheses.

## Exhibit D.6: Standard Deviations of Achievement in Reasoning Cognitive Domain

 MATHEMATICS  
 Grade 4

Countries	Overall		Girls		Boys	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Armenia	445 (3.1)	86 (2.0)	449 (3.4)	84 (2.3)	442 (3.4)	87 (2.4)
Australia	507 (3.6)	79 (1.8)	507 (3.9)	77 (2.1)	507 (4.2)	80 (2.3)
Belgium (Flemish)	541 (2.2)	72 (1.5)	541 (2.6)	71 (2.0)	541 (2.8)	74 (1.7)
Chinese Taipei	563 (2.2)	81 (1.3)	565 (2.6)	76 (1.6)	562 (2.7)	85 (1.7)
Cyprus	516 (2.4)	86 (1.4)	515 (2.7)	83 (1.6)	517 (3.0)	88 (1.8)
England	537 (3.5)	87 (1.5)	539 (4.0)	85 (2.0)	536 (4.2)	90 (2.1)
Hong Kong, SAR	564 (3.7)	79 (1.4)	565 (4.0)	75 (1.7)	563 (3.8)	82 (2.0)
Hungary	524 (3.2)	86 (2.0)	525 (4.0)	85 (2.4)	524 (3.8)	87 (2.3)
Iran, Islamic Rep. of	400 (3.4)	80 (1.9)	406 (6.0)	79 (2.9)	396 (4.3)	81 (2.2)
Italy	499 (4.0)	88 (2.0)	496 (4.7)	86 (2.7)	502 (4.1)	89 (2.1)
Japan	562 (1.7)	83 (1.0)	559 (2.1)	79 (1.3)	564 (2.6)	86 (1.4)
Latvia	531 (3.2)	83 (1.7)	531 (3.3)	80 (2.0)	531 (4.1)	85 (2.6)
Lithuania	526 (3.1)	85 (1.8)	527 (3.7)	82 (2.5)	529 (3.9)	89 (2.0)
Moldova, Rep. of	494 (4.9)	90 (3.1)	501 (5.5)	90 (3.9)	488 (5.6)	89 (3.3)
Morocco	368 (4.4)	81 (2.1)	366 (5.6)	82 (3.1)	370 (4.7)	80 (2.1)
Netherlands	535 (2.9)	67 (1.4)	533 (3.4)	66 (1.6)	536 (3.2)	68 (1.9)
New Zealand	503 (2.2)	84 (1.7)	502 (2.9)	82 (2.2)	504 (2.4)	85 (1.9)
Norway	468 (2.1)	87 (1.8)	466 (2.5)	85 (1.7)	470 (2.8)	88 (2.8)
Philippines	359 (7.4)	104 (5.1)	366 (8.8)	106 (6.3)	352 (6.6)	101 (4.1)
Russian Federation	526 (4.8)	85 (1.9)	524 (5.2)	83 (2.0)	528 (4.9)	86 (2.6)
Scotland	498 (3.1)	78 (1.9)	495 (3.5)	75 (2.2)	502 (4.0)	81 (2.2)
Singapore	574 (6.1)	96 (3.5)	578 (6.2)	92 (3.4)	570 (6.8)	99 (4.0)
Slovenia	485 (2.6)	84 (1.9)	486 (3.0)	81 (2.6)	485 (3.6)	88 (2.4)
Tunisia	340 (4.2)	98 (2.2)	340 (5.8)	98 (2.7)	339 (4.7)	98 (2.3)
United States	519 (2.5)	78 (1.0)	517 (2.6)	76 (1.0)	522 (2.9)	80 (1.3)
<b>Benchmarking Participants</b>						
Indiana State, US	528 (3.4)	67 (2.0)	528 (3.9)	64 (2.1)	528 (4.1)	70 (2.5)
Ontario Province, Can.	523 (3.6)	70 (2.2)	520 (3.4)	67 (1.7)	525 (4.8)	73 (3.0)
Quebec Province, Can.	512 (2.6)	73 (1.2)	510 (3.0)	72 (1.8)	514 (3.2)	73 (1.6)

SOURCE: IEA's Trends in International Mathematics and Science Study (TIMSS) 2003

() Standard errors appear in parentheses.