

1. MATHEMATICAL REASONING

Students use mathematical reasoning to analyze mathematical situations, make conjectures, gather evidence, and construct an argument.

A. use models, facts, and relationships to draw conclusions about mathematics and explain their thinking.

- Grade K Representative Pages: 42-45, 314-317, 372-375, 406-409, 464-467, 480-483, 498-501, 578-581, 610-613, 648-651
- Grade 1 Representative Pages: 11A-12, 19A-20, 25A-30, 57A-58, 71A-74, 125A-128, 191A-196, 403A-406, 549A-552, 565A-568
- Grade 2 Representative Pages: 17A-20, 71A-72, 159A-160, 199A-206, 255A-264, 385A-392, 475A-476, 515A-516, 555A-558, 563A-566
- Grade 3 Representative Pages: 16-17, 212-213, 234-235, 256-257, 274-275, 354-358, 396-397, 492-493, 546-547, 564-565
- Grade 4 Representative Pages: 16-17, 142-143, 168-169, 218-219, 250-251, 328-329, 372-374, 438-439, 570-573, 580-583

B. use patterns and relationships to analyze mathematical situations.

- Grade K 76-91, 92-95, 98-105, 110-113, 234-237, 538-541
- Grade 1 193A-194, 209A-214, 217A-218, 275A-276, 427A-428
- Grade 2 27A-28, 83A-84, 91A-92, 285A-286, 505A-506, 575A-576
- Grade 3 28-29, 256-257, 274-276, 301, 308-309, 324-325, 544-545
- Grade 4 112-114, 140-141, 166-167, 176-177, 192-193, 384-385, 494-495

C. justify their answers and solution processes.

Throughout the series, students discuss their strategies and solutions for the Problem Solving feature.

- Grade K Representative Pages: 42-45, 92-95, 176-179, 234-237, 314-317, 372-375, 422-425, 480-483, 578-581, 618-621
- Grade 1 Representative Pages: 35A-36, 77A-78, 131A-132, 159A-160, 231A-232, 283A-284, 363A-364, 431A-432, 527A-528, 581A-582
- Grade 2 Representative Pages: 33A-34, 75A-76, 129A-130, 159A-160, 263A-264, 393A-394, 443A-444, 475A-476, 533A-534, 567A-568
- Grade 3 Representative Pages: 64-65, 76-77, 142-143, 178-179, 224-225, 264-265, 280-281, 364-365, 404-405, 582-583
- Grade 4 Representative Pages: 70-71, 88-89, 128-129, 148-149, 188-189, 226-227, 354-355, 398-399, 430-431, 506-507

D. use logical reasoning to reach simple conclusions.

Throughout the series, students use logical reasoning to reach solutions for the Problem Solving feature.

- Grade K Representative Pages: 60-63, 110-113, 142-145, 252-255, 314-317, 350-353, 448-451, 510-513, 578-581, 648-651
Grade 1 Representative Pages: 119A-120, 131A-132, 159A-160, 231A-232, 283A-284, 329A-330, 419A-420, 431A-432, 459A-460, 581A-582
Grade 2 Representative Pages: 45A-46, 75A-76, 91A-92, 117A-118, 175A-176, 217A-218, 263A-264, 393A-394, 475A-476, 567A-568
Grade 3 Representative Pages: 76-77, 178-179, 188-189, 224-225, 264-265, 277-273, 364-365, 378-379, 404-405, 508-509
Grade 4 Representative Pages: 26-27, 70-71, 188-189, 242-243, 286-287, 398-399, 494-495, 576-577, 586-587, 590-591

2. NUMBER AND NUMERATION

Students use number sense and numeration to develop an understanding of the multiple uses of numbers in the real world, the use of numbers to communicate mathematically, and the use of numbers in the development of mathematical ideas.

A. use whole numbers and fractions to identify locations, quantify groups of objects, and measure distances.

- Grade K 148-171, 192-207, 214-225, 240-243, 342-345, 574-577, 594-609, 628-635
Grade 1 191A-198, 201A-204, 371A-376, 455A-458, 467A-470, 475A-478
Grade 2 65A-68, 325A-336, 417-420, 505A-512
Grade 3 4-5, 16-17, 32-35, 160-169, 182-185, 484-495, 500-503
Grade 4 16-17, 278-284, 290-295, 324-333, 342-345

B. use concrete materials to model numbers and number relationships for whole numbers and common fractions, including decimal fractions.

- Grade K 148-171, 192-207, 214-225, 406-417, 428-443, 464-475, 486-501, 574-577, 594-609, 624-239
Grade 1 191A-198, 201A-206, 371A-376
Grade 2 27A-28, 65A-68, 285A-286, 325A-336, 505A-512
Grade 3 4-5, 16-17, 32-35, 492-493, 524-525
Grade 4 9, 16-17, 118-119, 328-329, 372-373

C. relate counting to grouping and to place value.

Grade K 148-175, 192-207, 214-225, 594-609, 624-635
Grade 1 191A-198, 201A-206
Grade 2 67A-70, 507A-508, 513A-514
Grade 3 18-19, 32-35
Grade 4 4-5, 18-819

D. recognize the order of whole numbers and commonly used fractions and decimals.

Grade K 230-233, 636-639
Grade 1 229A-230, 373A-376
Grade 2 87A-88, 331A-332, 527A-530
Grade 3 22-23, 490-491, 518-519
Grade 4 6-8, 20-22, 338-340, 380-383

E. demonstrate the concept of percent through problems related to actual situations.

Grade 3 Can be developed from material on fractions and decimals 500-501, 512-515
Grade 4 Can be developed from material on fractions and decimals 372-373, 378-379

3. OPERATIONS

Students use mathematical operations and relationships among them to understand mathematics.

A. add, subtract, multiply, and divide whole numbers.

Grade K 406-417, 428-447, 464-475, 486-509
Grade 1 9A-18, 25A-30, 55A-64, 71A-78, 97A-104, 111A-120, 125A-132, 251A-260, 267A-272, 399A-408, 411A-420
Grade 2 13A-22, 29A-32, 199A-206, 223A-226, 255A-262, 269A-274, 363A-370, 373A-378, 383A-392
Grade 3 104-109, 116-121, 128-133, 138-143, 218-223, 228-232, 236-237, 258-262, 268-271, 278-279, 359-363, 370-377, 398-402, 408-419
Grade 4 56-63, 166-173, 180-185, 192-199, 220-225, 232-233, 570-573, 580-583

B. develop strategies for selecting the appropriate computational and operational method in problem-solving situations.

Grade K 510-513

Grade 1 77A-78, 283A-284, 431A-432, 581A-582

Grade 2 45A-46, 175A-176, 393A-394, 567A-568

Grade 3 64-65, 142-143, 188-189, 280-281, 364-365, 508-509, 582-583

Grade 4 70-71, 78-83, 148-149, 188-189, 260-261, 398-399, 576-577, 590-591

C. know single-digit addition, subtraction, multiplication, and division facts.

Grade K 444-447, 498-501

Grade 1 97A-108, 111A-120, 127A-128, 253A-258, 269A-272, 277A-280, 399A-408, 411A-418, 425A-426

Grade 2 43A-44, 363A-366, 373A-376, 387A-390

Grade 3 108-109, 116-119, 128-131, 218-223, 228-237, 258-271, 360-363, 370-371, 374-376, 398-401, 408-419

Grade 4 56-63, 124-125, 168-172

D. understand the commutative and associative properties.

Grade 1 31A-32, 99A-100, 125A-128, 257A-258, 275A-276, 407A-408

Grade 2 9A-10, 21A-22, 367A-368

Grade 3 102-103, 214-216, 278-279

Grade 4 54-55, 110-111, 164-165, 194-195

4. MODELING/MULTIPLE REPRESENTATION

Students use mathematical modeling/multiple representation to provide a means of presenting, interpreting, communicating, and connecting mathematical information and relationships.

A. use concrete materials to model spatial relationships.

Grade K 544-555, 566-569

Grade 1 349A-352

Grade 2 307A-312, 315A-318

Grade 3 298-300, 302-309, 312-317, 328-331

Grade 4 474-481, 498-503

B. construct tables, charts, and graphs to display and analyze real-world data.

Grade K 48-63, 176-179, 252-255, 350-353, 618-621

Grade 1 153A-154, 157A-158, 167A-170, 261A-262, 557A-558

Grade 2 111A-114, 125A-126, 517A-518

Grade 3 438-455

Grade 4 298-299, 416-417, 422-425

C. use multiple representations (simulations, manipulative materials, and diagrams) as tools to explain the operation of everyday procedures.

Grade K Representative Pages: 106-109, 142-145, 314-317, 372-375, 406-409, 448-451, 464-467

Grade 1 Representative Pages: 19A-20, 25A-30, 71A-74, 113A-116, 259A-260, 315A-320, 327A-328, 403A-406, 515A-518, 549A-552

Grade 2 Representative Pages: 153A-160, 167A-176, 227A-228, 283A-284, 429A-436, 439A-444, 463A-476, 481A-486, 531A-534, 579A-580

Grade 3 54-63, 68-75, 78-85, 160-174, 176-177, 192-193

Grade 4 30-37, 180-181, 236-237, 260-261, 434-443

D. use variables such as height, weight, and hand size to predict changes over time.

Grade 4 426-429 (line graphs)

E. use physical materials, pictures, and diagrams to explain mathematical ideas and processes and to demonstrate geometric concepts.

Grade K Representative Pages: 98-109, 130-141, 372-375, 406-409, 464-467, 480-483, 498-501, 526-541, 544-559, 566-577

Grade 1 Representative Pages: 9A-12, 25A-30, 55A-58, 65A-66, 71A-74, 105A-106, 259A-260, 353A-356, 359A-362, 369A-370

Grade 2 Representative Pages: 17A-20, 81A-82, 199A-206, 255A-264, 311A-312, 315A-318, 325A-336, 361A-362, 385A-392, 561A-566

Grade 3 Representative Pages: 16-17, 212-213, 234-235, 256-257, 274-276, 298-309, 312-317, 328-331, 354-358, 492-493

Grade 4 Representative Pages: 16-17, 168-169, 218-219, 250-251, 278-279, 328-329, 372-373, 438-439, 482-483, 486-487

5. MEASUREMENT

Students use measurement in both metric and English measure to provide a major link between the abstractions of mathematics and the real world in order to describe and compare objects and data.

A. understand that measurement is approximate, never exact.

Grade K 346-349, 356-371

Grade 1 451A-454, 465A-466, 473A-474

Grade 2 413A-416, 454 (Enrichment)

Grade 3 160-163, 168-171, 182-185, 186-187

Grade 4 278-284, 290-296

B. select appropriate standard and nonstandard measurement tools in measurement activities.

Grade K 330-349, 356-359, 364-367
Grade 1 453A-458, 467A-470, 475A-480
Grade 2 413A-420, 429A-436, 441A-444
Grade 3 160-177, 182-187, 190-195
Grade 4 278-284, 290-296

C. understand the attributes of area, length, capacity, weight, volume, time, temperature, and angle.

Grade K 330-349, 356-371
Grade 1 451A-458, 465A-470, 473A-480, 490 (Enrichment), 501A-506, 515A-516
Grade 2 417A-422, 429A-436, 439A-444, 463A-472
Grade 3 68-75, 78-83, 160-177, 182-187, 192-193, 298-300, 318-323, 332-335
Grade 4 278-284, 290-296, 302-307, 486-493, 504-507

D. estimate and find measures such as length, perimeter, area, and volume using both standard and nonstandard units.

Grade K 330-349
Grade 1 451A-458, 465A-470, 473A-480
Grade 2 413A-422, 433A-436
Grade 3 160-171, 182-187, 318-323, 332-335
Grade 4 278-284, 290-296, 488-493, 504-507

E. collect and display data.

Grade K 48-59, 350-353
Grade 1 153A-154, 157A-158, 167A-170, 261A-262, 557A-558
Grade 2 111A-114, 125A-126, 517A-518
Grade 3 438-455
Grade 4 298-299, 416-417

F. use statistical methods such as graphs, tables, and charts to interpret data.

Grade K 48-63, 350-353
Grade 1 153A-158, 165A-172, 527A-528, 557A-558
Grade 2 111A-118, 123A-130, 287A-288
Grade 3 440-441, 446-447, 454-455
Grade 4 418-431, 532-533, 550-551

6. UNCERTAINTY

Students use ideas of uncertainty to illustrate that mathematics involves more than exactness when dealing with everyday situations.

A. make estimates to compare to actual results of both formal and informal measurement.

Grade K 346-349, 372-375
Grade 1 451A-452, 465A-466, 473A-474
Grade 2 413A-416
Grade 3 160-163, 168-169, 186-187, 190-191
Grade 4 278-284, 290-296

B. make estimates to compare to actual results of computations.

Grade K 430 (Activity Option), 434 (Activity Option)
Grade 1 88 (Enrichment), 142 (Enrichment), 592 (Enrichment)
Grade 2 215A-216, 275A-276, 577A-578
Grade 3 110-113, 134-135, 188-189
Grade 4 64-67, 174-175, 254-255, 394-396, 574-575

C. recognize situations where only an estimate is required.

Grade K 248-251, 346-349, 356-359, 364-367, 372-375
Grade 1 223A-224, 451A-452, 465A-466, 473A-474
Grade 2 215A-216, 275A-276, 413A-416, 577A-578
Grade 3 110-113, 134-135, 160-163, 168-169, 186-189, 320-321, 332-333
Grade 4 12-13, 64-67, 174-175, 254-255, 394-396, 574-575

D. develop a wide variety of estimation skills and strategies.

Grade K 346-349, 356-359, 364-367, 372-375, 430 (Activity Option), 434 (Activity Option)
Grade 1 88 (Enrichment), 142 (Enrichment), 223A-224, 451A-452, 465A-466, 473A-474, 592 (Enrichment)
Grade 2 215A-216, 275A-276, 454 (Enrichment), 544 (Enrichment), 592 (Enrichment)
Grade 3 6-10, 12-13, 24-27, 110-113, 134-135, 162-163, 168-169, 320-321, 332-333
Grade 4 10-13, 24-25, 64-67, 174-175, 254-255, 394-396, 574-575

E. determine the reasonableness of results.

See Problem Solving features found throughout the series.

Grade K Representative Pages: 42-45, 176-179, 252-255, 314-317, 350-353, 448-451, 480-483, 510-513, 578-581, 648-651

Grade 1 Representative Pages: 35A-36, 77A-78, 119A-120, 131A-132, 171A-172, 283A-284, 431A-432, 459A-460, 479A-480, 581A-582

Grade 2 Representative Pages: 45A-46, 75A-76, 117A-118, 175A-176, 217A-218, 393A-394, 443A-444, 533A-534, 567A-568, 581A-582

Grade 3 Representative Pages: 12-13, 76-77, 112-113, 142-143, 264-265, 272-273, 336-337, 378-379, 508-509, 570-571

Grade 4 Representative Pages: 36-37, 70-71, 128-129, 188-189, 226-227, 260-261, 306-307, 398-399, 442-443, 494-495

F. predict experimental possibilities.

Grade 1 377A-378

Grade 2 337A-338

Grade 3 463-465

Grade 4 434-443

G. make predictions using unbiased random samples.

Grade 1 377A-378

Grade 2 337A-338

Grade 3 463-465

Grade 4 434-443

H. determine probabilities of simple events.

Grade 1 377A-378

Grade 2 337A-338

Grade 3 458-467

Grade 4 434-443

7. PATTERNS/FUNCTIONS

Students use patterns and functions to develop mathematical power, appreciate the true beauty of mathematics, and construct generalizations that describe patterns simply and efficiently.

A. recognize, describe, extend, and create a wide variety of patterns.

Grade K 76-95, 98-113, 234-237, 538-541
Grade 1 193A-194, 209A-214, 217A-218, 363A-364, 374
Grade 2 65A-66, 83A-84, 91A-92, 319A-320, 505A-506, 553A-554, 561A-562
Grade 3 28-29, 256-257, 274-275, 301, 308-309, 544-545
Grade 4 112-114, 140-141, 166-167, 176-177, 192-193, 384-385, 494-495

B. represent and describe mathematical relationships.

Grade K 76-91, 92-95, 98-105, 110-113, 234-237, 502-504
Grade 1 125A-126, 275A-280, 425A-428, 575A-576
Grade 2 27A-28, 285A-286, 575A-576
Grade 3 142-143, 356-358, 396-400
Grade 4 56-63, 70-71, 118-119, 128-129

C. explore and express relationships using variables and open sentences.

Grade K 418-421, 476-479, 510-513
Grade 1 125A-128, 131A-132, 259A-260, 275A-280, 283A-284, 419A-420, 425A-428, 431A-432, 575A-576
Grade 2 33A-34, 45A-46, 393A-394, 567A-568
Grade 3 142-143, 264-265, 280-281, 364-365, 412-413, 508-509, 582-583
Grade 4 74-87, 148-149, 188-189, 576-577, 590-591

D. solve for an unknown using manipulative materials.

Grade K 418-421, 476-483, 510-513
Grade 1 131A-132, 259A-260, 419-420, 581A-582
Grade 2 21A-22, 41A-42, 45A-46, 393A-394
Grade 3 142-143, 264-265, 280-281, 364-365, 412-413, 508-509, 582-583
Grade 4 74-87, 148-149, 188-189, 576-577, 590-591

E. use a variety of manipulative materials and technologies to explore patterns.

Grade K 76-95, 98-113, 234-237, 538-541
Grade 1 193A-194, 209A-214, 217A-218, 363A-364, 374
Grade 2 65A-66, 83A-84, 91A-92, 319A-320, 505A-506, 553A-554, 561A-562
Grade 3 288-29, 256-257, 274-275, 301, 308-309, 544-545
Grade 4 112-114, 140-141, 166-167, 176-177, 192-193, 384-385, 494-495

F. interpret graphs.

Grade K 48-63, 176-179, 252-255, 350-353, 618-621
Grade 1 155A-156, 165A-166, 169A-170, 171A-172
Grade 2 115A-116, 123A-124, 127A-130
Grade 3 438-439, 445-453
Grade 4 418-429, 532-533, 550-551

G. explore and develop relationships among two- and three-dimensional geometric shapes.

Grade K 526-537, 544-559
Grade 1 353A-356, 359A-362
Grade 2 307A-318
Grade 3 302-309, 312-317, 328-335
Grade 4 466-471, 474-481, 498-505

H. discover patterns in nature, art, music, and literature.

Grade K 76-79
Grade 1 209A (Two-Minute Math), 215B (Gifted and Talented), 374 (Problem Solving-Reasoning)
Grade 2 319A-320
Grade 3 301, 308-309
Grade 4 494-495