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Level 6
correlated to
NCTM Principles and Standards 2000

NCTM Standard	Houghton Mifflin *MATHEMATICS*
Number and Operations Standard	
Understand numbers, ways of representing numbers, relationships among numbers, and number systems	
• work flexibly with fractions, decimals, and percents to solve problems;	4–5, 13–15, 19, 21, 23, 25, 33, 35, 122–125, 128, 134–137, 157, 160, 163–165, 169, 171, 173, 175, 177, 179, 180–181, 188–189, 326–331, 351, 353, 355, 358, 365–373
• compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line;	6–9, 126–129, 134–137, 230–231, 326–327, 330–331
• develop meaning for percents greater than 100 and less than 1;	326–331
• understand and use ratios and proportions to represent quantitative relationships;	304–305, 308–309
• develop an understanding of large numbers and recognize and appropriately use exponential, scientific, and calculator notation;	2–3, 10–11, 55, 102, 106–107, 142
• use factors, multiples, prime factorization, and relatively prime numbers to solve problems;	102, 104–109, 112–117, 124–125, 142, 143, 168–169
• develop meaning for integers and represent and compare quantities with them.	204–209, 238, 246
Understand meanings of operations and how they relate to one another	
• understand the meaning and effects of arithmetic operations with fractions, decimals, and integers;	12–13, 20–23, 32–35, 156–163, 168–171, 174–179, 214–225, 226–227, 234–235
• use the associative and commutative properties of addition and multiplication and the distributive property of multiplication over addition to simplify computations with integers, fractions, and decimals;	18–19, 232–233, 240, 250, 252–254, 256–257, 262–263, 290, 291, 572–573
• understand and use the inverse relationships of addition and subtraction, multiplication and division, and squaring and finding square roots to simplify computations and solve problems.	174–179, 232–233, 240, 258–259, 280–283, 292, 310, 577–578
Compute fluently and make reasonable estimates	
• select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods;	13–15, 70, 123, 173, 216, 281, 327, 358, 360–361, 375, 395, 475, 518, 562
• develop and analyze algorithms for computing with fractions, decimals, and	12–13, 20–23, 32–35, 156–163, 168–171, 174–179, 214–225

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integers and develop fluency in their use;	
• develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results;	7, 9, 13, 14–15, 18, 20, 21, 22, 27, 123, 179, 187, 212, 263, 265, 307, 309, 322–323, 351, 360–361, 372, 451, 473, 475, 499, 547, 566–567
• develop, analyze, and explain methods for solving problems involving proportions, such as scaling and finding equivalent ratios.	308–312, 320–321, 332–333, 337, 348, 350–353, 376, 416–417, 496–497
Algebra Standard	
Understand patterns, relations, and functions	
• represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules;	36, 128, 139, 266–267, 283, 327, 358, 368–369, 554–557, 560–562, 578–579
• relate and compare different forms of representation for a relationship;	266–267, 283, 554–555, 560–562, 564–565, 574–575
• identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations.	39, 215, 283, 406, 560–562, 554–555, 578–579, 583, 590, 591
Represent and analyze mathematical situations and structures using algebraic symbols	
• develop an initial conceptual understanding of different uses of variables;	253, 270–271, 280, 560–561, 572–573
• explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope;	554–555, 564–565, 578–579, 591
• use symbolic algebra to represent situations and to solve problems, especially those that involve linear relationships;	270–277, 280–287, 310–312, 314–315, 318–323, 332–333, 339, 352–358, 450–455, 460–467, 474–479
• recognize and generate equivalent forms for simple algebraic expressions and solve linear equations	252–267, 270–277, 280–285, 554–557, 560–563, 572–573, 583
Use mathematical models to represent and understand quantitative relationships	
• model and solve contextualized problems using various representations, such as graphs, tables, and equations.	270–277, 280–287, 310–312, 314–315, 318–323, 332–333, 339, 352–358, 450–455, 460–467, 474–479, 554–557, 560–562, 566–567, 574–579
Analyze change in various contexts	
• use graphs to analyze the nature of changes in quantities in linear relationships.	68–70, 554–555, 566–567, 578–579, 583, 590, 591
Geometry Standard	
Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships	
• precisely describe, classify, and understand relationships among types of two- and three-dimensional objects using their defining	390–391, 410, 418–421, 470–471

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properties;	
• understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects;	392–399, 404–409, 450–455, 460–465, 472–477
• create and critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship.	412–417, 430–431
Specify locations and describe spatial relationships using coordinate geometry and other representational systems	
• use coordinate geometry to represent and examine the properties of geometric shapes;	552–553
• use coordinate geometry to examine special geometric shapes, such as regular polygons or those with pairs of parallel or perpendicular sides.	552–553
Apply transformations and use symmetry to analyze mathematical situations	
• describe sizes, positions, and orientations of shapes under informal transformations such as flips, turns, slides, and scaling;	426–429
• examine the congruence, similarity, and line or rotational symmetry of objects using transformations.	430–433
Use visualization, spatial reasoning, and geometric modeling to solve problems	
• draw geometric objects with specified properties, such as side lengths or angle measures;	391, 396–397, 399, 400–401, 410–415, 419, 422–423, 428
• use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume;	470–477
• use visual tools such as networks to represent and solve problems;	393, 396, 399, 400–401, 404, 410–415, 417, 431, 432–433, 464, 470–471, 552–553
• use geometric models to represent and explain numerical and algebraic relationships;	404, 407, 417, 422–423, 450–455, 460–465, 472–477, 554–555, 566
• recognize and apply geometric ideas and relationships in areas outside the mathematics classroom, such as art, science, and everyday life.	320–323, 394, 396, 397, 398, 399, 400–401, 416, 417, 432–433, 456–457, 462, 466–467, 474, 478–479
Measurement Standard	
Understand measurable attributes of objects and the units, systems, and processes of measurement	
• understand both metric and customary	38–40, 184–189, 194

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systems of measurement;	
• understand relationships among units and convert from one unit to another within the same system;	38–40, 184–189, 194
• understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume.	392–401, 450–455, 460–465, 472–479
Apply appropriate techniques, tools, and formulas to determine measurements	
• use common benchmarks to select appropriate methods for estimating measurements;	187, 407, 451, 473, 475, 554–555
• select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision;	38–40, 184–189, 194, 392–401, 450–455, 460–465, 472–479
• develop and use formulas to determine the circumference of circles and the area of triangles, parallelograms, trapezoids, and circles and develop strategies to find the area of more-complex shapes;	452–455, 460–465
• develop strategies to determine the surface area and volume of selected prisms, pyramids, and cylinders;	472–479
• solve problems involving scale factors, using ratio and proportion;	320–323, 416–417
• solve simple problems involving rates and derived measurements for such attributes as velocity and density.	306–312, 314–315, 318–319, 322–323
Data Analysis and Probability Standard	
Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them	
• formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population;	520–521
• select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots.	42–43, 62–64, 66–73, 82–87, 98–99, 138–139, 506–507, 512–514
Select and use appropriate statistical methods to analyze data	
• find, use, and interpret measures of center and spread, including mean and interquartile range;	60–61, 65, 71, 76–79, 84–85
• discuss and understand the correspondence	62–63, 66–69, 72–73, 78–79, 82–87, 138–139,

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between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatterplots.	504–507
Develop and evaluate inferences and predictions that are based on data	
• use observations about differences between two or more samples to make conjectures about the populations from which the samples were taken;	496–501, 508–509, 530–531
• make conjectures about possible relationships between two characteristics of a sample on the basis of scatterplots of the data and approximate lines of fit;	566
• use conjectures to formulate new questions and plan new studies to answer them.	499
Understand and apply basic concepts of probability	
• understand and use appropriate terminology to describe complementary and mutually exclusive events;	516–518, 520–521, 524–529
• use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations;	516–518, 520–521, 524–529, 530–531
• compute probabilities for simple compound events, using such methods as organized lists, tree diagrams, and area models.	512–518, 520–521, 524–529
Problem Solving Standard	
Instructional programs from prekindergarten through grade 12 should enable all students to—	
• build new mathematical knowledge through problem solving;	130–131, 180–181, 188–189, 276–277, 314–315, 332–333, 368–369, 372–373, 422–423, 432–433, 478–479, 530–531, 578–579
• solve problems that arise in mathematics and in other contexts;	14–15, 24–25, 42–43, 72–73, 80–81, 86–87, 118–119, 130–131, 138–139, 164–165, 180–181, 188–189, 210–211, 226–227, 234–235, 266–267, 276–277, 286–287, 314–315, 322–323, 332–333, 360–361, 368–369, 372–373, 400–401, 422–423, 432–433, 456–457, 466–467, 478–479, 499–500, 508–509, 529–530, 556–557, 566–567, 578–579
• apply and adapt a variety of appropriate strategies to solve problems;	15, 25, 43, 73, 81, 87, 119, 131, 139, 165, 181, 189, 211, 227, 235, 267, 277, 287, 315, 323, 333, 361, 369, 373, 401, 423, 433, 457, 466–467, 479, 500, 509, 530, 557, 567, 579
• monitor and reflect on the process of mathematical problem solving.	14, 24, 42, 72, 80, 86, 118, 130, 138, 164, 171,180, 188, 207, 210, 215, 226, 234, 259, 263, 266, 276, 286, 305, 314, 322, 332, 360, 368, 372, 391, 399, 400, 422, 431, 432, 451, 455, 456, 466,

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	471, 478, 499, 505, 508, 529, 556, 565, 566, 578
Reasoning and Proof Standard	
Instructional programs from prekindergarten through grade 12 should enable all students to—	
• recognize reasoning and proof as fundamental aspects of mathematics;	22, 30, 66, 78, 82, 104, 110, 116, 124, 135, 162, 172, 178, 214, 246, 264, 274, 280, 306, 320, 328, 354, 394, 396, 416, 430, 450, 461, 474, 507, 513, 524, 560, 570, 591
• make and investigate mathematical conjectures;	13, 64, 85, 98, 107, 123, 157, 160, 163, 169, 171, 177, 263, 499, 514, 550, 553, 571
• develop and evaluate mathematical arguments and proofs;	14, 24, 42, 72, 80, 86, 118, 130, 138, 164, 180, 188, 210, 226, 234, 266, 276, 286, 314, 322, 332, 360, 368, 372, 400, 422, 432, 456, 466, 478, 496–497, 499, 508–509, 516–518, 520–521, 529, 530–531, 556, 566, 578
• select and use various types of reasoning and methods of proof.	61, 70, 105, 114, 118–119, 128, 169, 171, 179, 209, 220, 223, 254, 257, 260, 281, 312, 331, 358, 393, 395, 397, 399, 420, 431, 451, 455, 462, 473, 475, 562
Communication Standard	
Instructional programs from prekindergarten through grade 12 should enable all students to—	
• organize and consolidate their mathematical thinking through communication;	9, 19, 21, 23, 31, 37, 53, 59, 67, 70, 77, 79, 83, 85, 97, 105, 107, 109, 111, 114, 117, 125, 135, 137, 149, 155, 160, 163, 177, 199, 207, 209, 225, 231, 245, 251, 254, 257, 275, 297, 312, 319, 329, 343, 349, 351, 365, 367, 371, 383, 389, 391, 393, 420, 443, 453, 462, 465, 477, 489, 497, 499, 514, 527, 529, 541, 547, 550, 555, 589
• communicate their mathematical thinking coherently and clearly to peers, teachers, and others;	41, 65, 129, 161, 185, 221, 247, 255, 313, 359, 407, 411, 415, 429, 463, 519, 521, 543, 551
• analyze and evaluate the mathematical thinking and strategies of others;	35, 41, 65, 129, 161, 175, 187, 221, 247, 255, 260, 313, 331, 355, 359, 406, 407, 463, 471, 507, 519, 543, 551
• use the language of mathematics to express mathematical ideas precisely.	2–3, 58–59, 102–103, 154–155, 204–205, 250–251,302–303, 348–349, 388–389, 448–449, 494–495, 546–547
Connections Standard	
Instructional programs from prekindergarten through grade 12 should enable all students to—	
• recognize and use connections among mathematical ideas;	38–40, 252–257, 262–263, 306–312, 314–315, 318–323, 326–331, 366–367, 370–371, 404, 407, 417, 422–423, 450–455, 460–465, 472–477, 552–555, 566
• understand how mathematical ideas interconnect and build on one another to produce a coherent whole;	10–11, 18–23, 28–35, 156–163, 168–179, 214–225, 304–312, 350–358, 450–455, 474–476
• recognize and apply mathematics in	29, 77, 107, 171, 223, 275, 321, 353, 391, 462,

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contexts outside of mathematics.	517, 553
Representation Standard	
Instructional programs from prekindergarten through grade 12 should enable all students to—	
• create and use representations to organize, record, and communicate mathematical ideas;	63–64, 68–69, 80–82, 84–85, 86–87, 158, 168, 174, 210–211, 214, 217, 218, 241, 252, 262, 330, 422–423,439, 452, 454, 464, 466–467, 512–514, 520–521, 552–555
• select, apply, and translate among mathematical representations to solve problems;	42–43, 44, 49, 51, 53, 74, 86–87, 91, 95, 96, 99, 138–139, 140, 145, 188–189, 195, 263, 271, 286–287, 293, 309, 351, 432–433, 439, 478–479, 485, 504, 505, 506–507, 510, 530–531, 535, 537, 541, 578–579, 585
• use representations to model and interpret physical, social, and mathematical phenomena.	63–64, 68–69, 80–82, 84–85, 86–87, 158, 168, 174, 210–211, 214, 217, 218, 241, 252, 262, 330, 422–423,439, 452, 454, 464, 466–467, 512–514, 520–521, 552–555