ALASKA
Eighth Grade Math Performance Standards
Impact Mathematics: Algebra and More
Course 3 © 2005

STANDARDS	PAGE REFERENCES
8:1 Estimation:	
.1 Estimate solutions to problems to check reasonableness of results.	SE: 53 #5, 55 #5b, 59 #15e, 61 #27, 132, 482 #25b *Explore* 127 *Lab Investigation* 161 #13c, 367 #10-#11 *Think & Discuss* 515
.2 Estimate probability of an event from random samples or experimental data.	SE: 547-550, 558-563, 566-568, 573-581 *Think & Discuss* 544, 565, 582, 584
.3 Use estimation to compare metric and standard units.	SE: 247 #3b, 513 #50 *Lab Investigation* 160 #6 *Think & Discuss* 51
.4 Explain when an estimate is appropriate and when an exact answer is needed.	Explaining when an estimate is appropriate and when an exact answer is needed can be taught along with the following examples. SE: 54, 101, 125 #24, 156-157 Problem Set J, 247 *Share & Summarize* 92
.5 Use estimation to check calculator or computer accuracy.	SE: 157 #3c, 401 #4b
.6 Estimate the square root of a number by finding the two square numbers between which it lies.	This method of estimating a square root can be reviewed with the following example. SE: *Share & Summarize* 197 This standard also is covered in *Impact Mathematics: Algebra and More Course 1* © 2004.
8:2 Number Sense:	
.1 Solve problems using ratio, proportion, and percent.	SE: 7, 10 #7, 11 #2, 113-115, 389 #63, 594 #12, 617 #4 Also see *Impact Mathematics: Algebra and More Course 1* © 2004.
.2 Describe and model the relationship between equivalent fractions, decimals, percents, or ratios when solving problems.	SE: 202 Problem Set J, 210 #12, 544, 553 *Example* 553 *Think & Discuss* 489 TG: AL T201 DT 202 #5
.3 Use manipulatives, diagrams, or symbols to explain how to solve different types of percent problems.	SE: 389 #63b, 617 #4 This standard also is covered in *Impact Mathematics: Algebra and More Course 1* © 2004.

STANDARDS	PAGE REFERENCES
.4 Use mental math to calculate discounts, taxes, interest, commissions and gratuities.	Mental math can be used with the following example. SE: 289 #63 This standard also is covered in *Impact Mathematics: Algebra and More Course 1* © 2004.
.5 Compare and order real numbers using >, <, and =.	SE: 227-229, 232-234, 235-238 *Think & Discuss* 226 TG: 226
.6 Write and solve problems that use primes, factors, and multiples.	SE: 131, 137 #14, 485 #19-#24, 491 Problem Set B TG: AM T131, T496
.7 Explain the relationship between the subsets of the real number system.	SE: 200, 202 *Just the Facts* 192 *Think & Discuss* 200
.8 Model counting in a different base system.	SE: *Lab Investigation* 219-222 TG: LI T219
.9. Explain order of operations.	SE: *Think & Discuss* 214 This standard also is covered in *Impact Mathematics: Algebra and More Course 1* © 2004.
8:3 Concepts of Number Operations:	
.1 Use manipulatives or diagrams to explain how to approximate a square root.	Approximating a square root can be reviewed with the following exercise. SE: *Share & Summarize* 197 This standard also is covered in *Impact Mathematics: Algebra and More Course 1* © 2004.
.2 Write and solve problems involving multiple operations.	SE: 214-218, 223-225, 229-231, 235-239, 245-248, 256-259 *Share & Summarize* 218, 248 *Think & Discuss* 216, 245
.3 Use manipulatives, diagrams, symbols, and words to describe addition, subtraction, multiplication and division of integers.	SE: 241-244, 245-248, 374-383 *Explore* 4-5, 70-71
.4 Use manipulatives or a diagram to explain absolute value.	SE: 118 This standard also is covered in *Impact Mathematics: Algebra and More Course 2* © 2004.
.5 Use the commutative, associative, and distributive properties to solve problems with variables and rational numbers.	SE: 22 #14-#17, 369 #9-#16 *Example* 404 *Share & Summarize* 361 *Think & Discuss* 362
.6 Use inverse operations and the properties of zero and 1 to solve problems with variables and rational numbers.	SE: 115, 150, 199 #5 *Think & Discuss* 117, 496 TG: AM T496 SA T115
.7 Use and explain prime factorization.	TG: AM T496 This standard also is covered in *Impact Mathematics: Algebra and More Course 1* © 2004.

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8:4 Computation:	
.1 Use paper and pencil, mental math, or a calculator to efficiently and accurately solve problems with real numbers.	SE: 214-218, 223-225, 226-229, 229-231, 232-234, 235-239 *Think & Discuss* 214
.2 Apply order of operations to real numbers.	SE: 214-218, 223 #7-#8, 377, 378 #3, 381 Problem Set G, 409 #22-#23 *Example* 196 *Share & Summarize* 155 *Think & Discuss* 216 TG: SA T217
.3 Use percent to create circle graphs.	This standard is covered in *Impact Mathematics: Algebra and More Course 1* © 2004.
.4 Add, subtract, multiply and divide fractions, decimals and integers with and without a calculator.	SE: 192 #1-#11, 201, 214-218, 394 #12, 411-420, 485 #30-#39, 536 #55-#58 *Think & Discuss* 156 TG: D T114 #3 SA T216, T217
.5 Solve problems using percent of increase or decrease.	SE: 617 #4a This standard is covered in *Impact Mathematics: Algebra and More Course 2* © 2004.
.6 Write and solve practical problems that use real numbers.	SE: 101, 218 #5, 228, 235 #13-#15 *Explore* 260 *Lab Investigation* 270-274
.7 Convert numbers between standard form and scientific notation using both positive and negative exponents.	SE: 157 #1d TG: D T158 #1 This standard also is covered in *Impact Mathematics: Algebra and More Course 2* © 2004.
8:5 Geometry:	
.1 Identify, classify, and compare polygons and polyhedra.	SE: 22 #13, 76-77, 297 #2, 299 #13, 311 #9, 465 #36, 500 *Lab Investigation* 475-478 *Think & Discuss* 358, 373
.2 Identify and use the vocabulary related to regular and irregular polygons, circles, polyhedra, and their components.	SE: 255 #24, 299 #13, 311 #9a, 465 #36, 535 #46 *Lab Investigation* 366
.3 Use the relationships of angles formed by parallel, perpendicular and intersecting lines to solve problems.	SE: 205 #53, 294-296, 315 Problem Set B TG: AM T295
.4 Describe the relationship of angles in different types of polygons.	SE: 510 #27 This standard also is covered in *Impact Mathematics: Algebra and More Course 1* © 2004.
.5 Construct or draw geometric figures in three dimensions.	SE: 336-337 #10 This standard also is covered in *Impact Mathematics: Algebra and More Course 1* © 2004.
.6 Identify corresponding parts in similar and congruent geometric figures using a scale factor.	SE: 329-333, 334-337 TG: AL T331, T333 This standard also is covered in *Impact Mathematics: Algebra and More Course 2* © 2004.
.7 Use similarity and congruence to find missing angles or sides of figures.	SE: 206 #58 This standard also is covered in *Impact Mathematics: Algebra and More Course 2* © 2004.

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.8 Graph translations, rotations, reflections and dilations of plane figures and describe the transformation in words and symbols.	SE: 289-291, 292-295, 295-301, 302-304, 305-309, 309-312, 313-315, 316-317, 329-333, 334-338
.9 Describe the use of translations, reflections and rotations in a tessellation (e.g., Escher drawing).	SE: 322-328 *Lab Investigation* 318-321
.10 Draw a polygon that will not tessellate and explain why.	Polygons that will not tessellate can be discussed with the following examples. SE: *Lab Investigation* 319, 321 #8-#10
.11 Model and apply the Pythagorean Theorem.	SE: 63 #31, 202 This standard also is covered in *Impact Mathematics: Algebra and More Courses 1* and *2* © 2004.
8:6 Measurement	
.1 Use, compare, and convert between units in the metric system for length, mass, area, and volume.	SE: 441 #35 Also see *Impact Mathematics: Algebra and More Course 2* © 2004.
.2 Use, compare, and convert between units in the standard system for length, time, weight, area and volume.	SE: 441 #35, 498 #3, #5-#6, 513 #50b *Remember* 513 TG: AL T402
.3 Use multiple strategies, including formulas, to find rates and to find volume and surface area; use correct units.	SE: 62 #30, 72 #1, 338 #21-#22, 503 #4, #8, 535 #46 *Family Letter* 3 *Remember* 72 TG: I T4 #1
.4 Explain what precision can be expected when measuring.	SE: 61 #27e *Family Letter* 3 *Think & Discuss* 51 TG: D T51, T54 #4
.5 Use indirect measurement to solve problems.	SE: 61 #27c Also see *Impact Mathematics: Algebra and More Course 2* © 2004.
.6 Explain what happens to ratios when changes are made to one or more dimensions of a figure.	SE: 110, 111 Problem Set B, 500-501 *Lab Investigation* 502
.7 Use manipulatives or diagrams to explain the Pythagorean Theorem.	SE: 63 #31, 202 *Remember* 202
.8 Solve practical problems involving proportions, the Pythagorean Theorem, and [1]**.**	SE: 6-7, 10-11, 13, 20 #9, 22 #12 *Real-Life Math* 2 TG: AE T9, T15 AL T7
8:7 Statistics:	
.1 Present data as a scatter plot, stem & leaf, circle graph, line graph, histogram, box & whiskers, and bar graph; make an argument for which graph best represents the data.	SE: 52, 54, 207 #71, 537, 570 #6, 572, 575, 614 #6, 625 #13, 627
.2 Find a line of best fit or trend line for a given set of data and use it to predict future outcomes.	SE: 52-55, 58 #14, 61 #27, 66 #13 TG: AM T52
.3 Analyze data using patterns or trends and make decisions or defend a conclusion.	SE: 607, 613-615, 625 #14, 626 #15d, 627 #17a *Share & Summarize* 608 TG: SA T604 TT T608

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.4 Explain or demonstrate how statistics are used to influence decisions.	SE: 603 *Real-Life Math* 600 *Share & Summarize* 604, 615, 641 *Think & Discuss* 602
.5 Conduct an experiment or simulation that leads to a generalization or formula.	SE: 604 #4e, #2, 612-615 *Family Letter* 601 *Share & Summarize* 604, 615 *Think & Discuss* 631
.6 Identify rules and formulas, based on multiple experiments and observed outcomes.	SE: 632-633, 635 #8-#10, 642 *Share & Summarize* 634, 636 TG: AM T632 D T633
8:8 Probability:	
.1 Express the theoretical and experimental probabilities of dependent, independent and multiple (compound) events as a ratio or percent.	SE: 547 #5b, 549 #2b, 550 #1-#8, 556 #20, #36, 558 #1b, #1d-#1e, 559 #4b-#4e *Think & Discuss* 544, 565 TG: AM T567 SA T553
.2 Predict the probability of a dependent event occurring, design an experiment to test the probability, compute the outcome, and compare it to the original prediction.	SE: 547-548, 558-559 #2, 566-570, 571-572, 582-586, 587-589 *Think & Discuss* 544 TG: MB 543a
.3 Use a variety of strategies to determine the number of possible outcomes.	SE: 544, 547-557 *Family Letter* 543 *Lab Investigation* 545-546 *Real-Life Math* 542 *Think & Discuss* 555, 565 TG: AL T546 AM T546, T583 I 542 SA T553
8:9 Patterns:	
.1 Identify and explain a classic pattern (e.g. Pascal's Triangle, Fibonacci Numbers, Pythagorean Triples, etc.).	SE: 239 #54
.2 Translate an arithmetic or geometric pattern into a rule.	SE: 75 #6-#8, 76-77, 78 #2b, 147 #1c-#1d *Share & Summarize* 77
.3 Find a rule from a sequential pattern and translate it into symbolic form to determine the nth term.	SE: 77 #8, 78 #2b, 79 #2f, #3a, 129, 130 #4c, 147 #1b, #1-#4 *Explore* 146 TG: D T148 #2 SA T129
.4 Use patterns from tables or graphs to predict an outcome.	SE: 74, 129 #3, 134-135 #6, 171, 562 #11d-#11e *Lab Investigation* 545-546 *Think & Discuss* 170 TG: AL T546
.5 Use patterns as a strategy for solving problems.	SE: 80 #6, 81 #9, 555-556 *Think & Discuss* 149 TG: AL T546

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.6 Find a missing item in an arithmetic and geometric sequence, with and without a calculator, and predict the graph of each function.	SE: 75 #9, 81 #9, 189 #32 *Explore* 70-71
.7 Use tables of ordered pairs, graphs on coordinate planes, and linear equations as tools to represent and analyze patterns.	SE: 81 #8, 175 #3, 176 #6, 179, 180-181 *Share & Summarize* 181
8:10 Algebra:	
.1 Translate word problems into numerical expression, inequalities, or equations.	SE: 7 #3-#4, 10 #3, 11 #9, 13, 16 #1c, #1f, 17 #3, 21 #10c, #11a, #11d, 173 #2 *Share & Summarize* 174 TG: D T8 #4
.2 Write word problems from symbolic statements.	Word problems written from symbolic statements can be taught with the following examples. SE: 11, 57 #13, 59 #16, 230 #3-#6 *Think & Discuss* 113 TG: SA T227
.3 Solve and graph two-step equations and inequalities.	SE: 214-218, 223 #9-#10, 284 #19, 563 #19-#20 *Example* 32 TG: SA T216, T217
.4 Graph the equation of a line that is in slope/intercept form.	SE: 39 #12, 43 #33-#38 *Explore* 46 *Lab Investigation* 36-37
.5 Identify slopes as positive, negative, zero, or undefined.	SE: 22 #12c, 27-28, 33 Problem Set F, 60 #25 *Share & Summarize* 29 TG: D T33 #2 SA T28
.6 Combine like terms to simplify expressions.	SE: 223 #7-#8, 377, 378 #3, 381 Problem Set G, 409 #22-#23 *Example* 196 *Think & Discuss* 216
.7 Use order of operations including grouping symbols and exponents to solve problems.	SE: 214-218, 223 #7-#8, 377, 378 #3, 381 Problem Set G, 409 #22-#23 *Example* 196 *Share & Summarize* 155 *Think & Discuss* 216 TG: SA T217
.8 Use the commutative, associative, and distributive and properties of 0 and 1 to solve two-step equations and check the solutions.	SE: 22 #14-#17, 214-218, 223 #9-#10, 358-359, 368 #2, 372 #42-#44, 377 Problem Set B *Share & Summarize* 361 TG: AL T218
.9 Represent a linear function as a table and a graph.	SE: 230 #2b, 233 #1, #7, 238 #36-#39 *Example* 234 *Explore* 240 *Think & Discuss* 84 TG: AM T230
8:11 Problem Solving:	
.1 Evaluate, interpret, and justify solutions to problems.	SE: 44 #40f, 385 #22-#23, 402 #3 *Explore* 390 *Lab Investigation* 367 #12-#13 *Share & Summarize* 392 *Think & Discuss* 49, 230, 242

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8:12 Communication:	
.1 Explain and use a variety of problem solving strategies.	SE: 48 #1, 214-218, 223 #1-#8, 230-231, 382, 415 *Share & Summarize* 49, 50 *Think & Discuss* 214, 381 TG: D T147 #2
.2 Represent a problem numerically, graphically, symbolically, and translate between these alternative representations.	SE: 10-11, 38 #2, 120 #1, 237 #35, 401, 647 *Explore* 127 *Share & Summarize* 92 *Think & Discuss* 515
.3 Use math vocabulary, symbols, and notations to explain, justify, and defend mathematical ideas.	SE: 72, 193-195, 199, 294 *Remember* 146 *Share & Summarize* 35, 92, 152, 199 TG: AM T88 TT T131
8:13 Reasoning:	
.1 Recognize and apply deductive and inductive reasoning in both concrete and abstract contexts.	SE: *Lab Investigation* 36-37, 96-97, 159-161, 219-222, 270-274, 318-321, 366-367, 475-478, 502-503, 545-546
8:14 Connections:	
.1 Use mathematical ideas from one area of mathematics to explain an idea from another area of mathematics (e.g., algebra to geometry).	SE: 78 #1, 105 #30, 130 TG: AM T26 D T503 #2
.2 Translate between various representations of equivalent representations.	SE: 50 #1, 57 #13, 72 #1 *Example* 32 *Explore* 29 *Think & Discuss* 49

Codes Used for TG Pages

AE	Additional Example
AL	Access for all Learners
AM	About Mathematics
D	Develop
I	Introduce
LI	Lab Investigation
MB	Mathematical Background
SA	On the Spot Assessment
TT	Tips from Teachers