



IMPACT
Mathematics
COURSE 3

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STANDARDS	PAGE REFERENCES
Number, Number Sense and Operations Standard	
<i>Number and Number Systems</i>	
1. Use scientific notation to express large numbers and small numbers between 0 and 1.	<p>Student Edition: 148 #17-#19, 152 #21-#26, 156-158, 159-161, 162 #1, 163 #18b, 164 #43, 165 #45, 167 #57, 200 #3, 203 #2</p> <p>Teacher Guide: A 157; AE 161; DU 148, 152, 156, 158; ML 157; RAL 158; TD 156; TS 158</p>
2. Recognize that natural numbers, whole numbers, integers, rational numbers and irrational numbers are subsets of the real number system.	<p>Student Edition: <i>MathLink</i> 186, 589</p>
<i>Meaning of Operations</i>	
3. Apply order of operations to simplify expressions and perform computations involving integer exponents and radicals.	<p>Student Edition: 146-148, 149-152, 153-155, 163 #18, 164 #22-#40, 169-171, 172-174</p> <p>Teacher Guide: AE 151; DU 147, 154; QQ 168; RAL 154; SS 155; TD 149; TS 146, 154</p>

STANDARDS	PAGE REFERENCES
4. Explain and use the inverse and identity properties and use inverse relationships (addition/subtraction, multiplication/division, squaring/square roots) in problem solving situations.	Student Edition: 312-316, 323 #16 Teacher Guide: E 313, 314; QC 324; QQ 324; RAL 316; SS 316; TD 312, 314
<i>Computation and Estimation</i>	
5. Determine when an estimate is sufficient and when an exact answer is needed in problem situations, and evaluate estimates in relation to actual answers; e.g., very close, less than, greater than.	Student Edition: 71-73, 107 #1 Teacher Guide: I 71; RAL 72; TT 73
6. Estimate, compute and solve problems involving rational numbers, including ratio, proportion and percent, and judge the reasonableness of solutions.	Student Edition: 116-118, 119 #2-#6, 123-126, 132-133, 134 #4, 135 #6, 136 #8, 141 #5-#8, 142 #15, 143 #3 Teacher Guide: A 118; AE 118; DU 116; MB 124; QC 122; QQ 122; RAL 126, 129; SS 118; TD 117, 125; TS 118; TT 123; WU 116
7. Find the square root of perfect squares, and approximate the square root of non-perfect squares as consecutive integers between which the root lies; e.g., $\sqrt{130}$ is between 11 and 12.	Student Edition: 185-187, 493 Teacher Guide: A 496; DU 494; E 185; I 185, 493; T 495; TT 186
8. Add, subtract, multiply, divide and compare numbers written in scientific notation.	Student Edition: 156-158, 164 #43, 165 #45 <i>Share & Summarize</i> 158 Teacher Guide: A 157; DU 158; SS 158; TD 156; TS 158
Measurement Standard	
<i>Measurement Units</i>	
1. Compare and order the relative size of common U.S. customary units and metric units; e.g., mile and kilometer, gallon and liter, pound and kilogram.	See Glencoe's <i>Impact Mathematics Course 1</i> © 2009 Lesson 7.4 (pages 449-461.)
2. Use proportional relationships and formulas to convert units from one measurement system to another; e.g., degrees Fahrenheit to degrees Celsius.	Student Edition: 168 #59-#61, 318 #6-#8, 319 #9-#11, 320 #13-#14, 369 #24 Teacher Guide: A 321; ML 174; TT 319

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<i>Use Measurement Techniques and Tools</i>	
3. Use appropriate levels of precision when calculating with measurements.	See Glencoe's <i>Math Connects: Concepts, Skills, and Problem Solving, Course 3</i> © 2009. Student Edition: <i>Concepts and Skills Bank</i> 736
4. Derive formulas for surface area and volume and justify them using geometric models and common materials. For example, find: a. the surface area of a cylinder as a function of its height and radius; b. that the volume of a pyramid (or cone) is one-third of the volume of a prism (or cylinder) with the same base area and height.	Student Edition: 171 #8-#9, 392 #1-#3, 538-539 Teacher Guide: AE 393; MC 392; TIO 538; TS 392
5. Determine surface area for pyramids by analyzing their parts.	See Glencoe's <i>Impact Mathematics Course 1</i> © 2009 Lesson 7.3 (pages 434-448).
6. Solve and determine the reasonableness of the results for problems involving rates and derived measurements, such as velocity and density, using formulas, models and graphs.	Rates are covered in Glencoe's <i>Impact Mathematics Course 2</i> © 2009 in Lesson 8.1 (pages 381-388).
7. Apply proportional reasoning to solve problems involving indirect measurements or rates.	See Glencoe's <i>Impact Mathematics Course 1</i> © 2009 Lesson 5.2 (pages 308-320).
8. Find the sum of the interior and exterior angles of regular convex polygons with and without measuring the angles with a protractor.	See Glencoe's <i>Impact Mathematics Course 1</i> © 2009 Lesson 1.2 (pages 31-39).
9. Demonstrate understanding of the concepts of perimeter, circumference and area by using established formulas for triangles, quadrilaterals, and circles to determine the surface area and volume of prisms, pyramids, cylinders, spheres and cones. (Note: Only volume should be calculated for spheres and cones.)	Student Edition: 171 #8-#9, 207 #1, 208 #3, 209 #6, 392 #1-#3, 536 #1, 538-539 <i>Think and Discuss</i> 206 Teacher Guide: AE 209, 393; I 207; MC 392; RAL 207; TD 207; TIO 538; TS 392
10. Use conventional formulas to find the surface area and volume of prisms, pyramids and cylinders and the volume of spheres and cones to a specified level of precision.	Student Edition: 171 #8-#9, 392 #1-#3, 538-539 Teacher Guide: AE 393; MC 392; TIO 538; TS 392

STANDARDS	PAGE REFERENCES
Geometry and Spatial Sense Standard	
<i>Characteristics and Properties</i>	
1. Make and test conjectures about characteristics and properties (e.g., sides, angles, symmetry) of two-dimensional figures and three-dimensional objects.	Student Edition: 260-262, 268 #1-#4, 272 #18, 273-276, 490 #49 <i>Think and Discuss</i> 273 Teacher Guide: QC 271; QQ 272, 284; RAL 260, 261, 273, 276; TD 273; TS 276; TT 262, 274
2. Recognize the angles formed and the relationship between the angles when two lines intersect and when parallel lines are cut by a transversal.	Student Edition: 91-93, 94 #1-#4 Teacher Guide: A 92; DU 92; E 91; QC 95; QQ 95; RAL 93; SS 93; TS 91; TT 93
3. Use proportions in several forms to solve problems involving similar figures (part-to-part, part-to-whole, corresponding sides between figures).	Student Edition: 297 example, 299 #6 <i>Share and Summarize</i> 298 <i>Think and Discuss</i> 100 Teacher Guide: A 297; TT 297
<i>Spatial Relationships</i>	
4. Represent and analyze shapes using coordinate geometry; e.g., given three vertices and the type of quadrilateral, find the coordinates of the fourth vertex.	See Glencoe's <i>Impact Mathematics Course 1</i> © 2009 Lesson 7.3 (page 434).
<i>Transformations and Symmetry</i>	
5. Draw the results of translations, reflections, rotations and dilations of objects in the coordinate plane, and determine properties that remain fixed; e.g., lengths of sides remain the same under translations.	Student Edition: 277-278, 285-287, 288-289, 294-298, 299 #5, 300 #9, 301 #11, 302 #13, 304 #17, 306-308, 309 #1 Teacher Guide: A 297; RAL 278, 288, 295, 296; SS 289; TD 285; TS 278, 286, 289, 298; TT 286, 288
<i>Visualization and Geometric Models</i>	
6. Draw nets for a variety of prisms, pyramids, cylinders and cones.	See Glencoe's <i>Impact Mathematics Course 1</i> © 2009 Lesson 7.3 (page 434).

STANDARDS	PAGE REFERENCES
Patterns, Functions and Algebra Standard	
<i>Use Patterns, Relations and Functions</i>	
1. Relate the various representations of a relationship; i.e., relate a table to graph, description and symbolic form.	Student Edition: 7 #3-#4, 10 #3, 13 #1-#2, 16 #1, 17 #3, 21 #11, 22 #12 Teacher Guide: AE 15; QC 22; QQ 23
2. Generalize patterns and sequences by describing how to find the n th term.	See Glencoe's <i>Impact Mathematics Course 1</i> © 2009 Lesson 3.2 (pages 120-125).
3. Identify functions as linear or nonlinear based on information given in a table, graph or equation.	Student Edition: <i>Share and Summarize</i> 15
<i>Use Algebraic Representations</i>	
4. Extend the uses of variables to include covariants where y depends on x .	Student Edition: 63 #3
5. Use physical models to add and subtract monomials and polynomials, and to multiply a polynomial by a monomial.	Student Edition: 225-226, 227-228, 229-230, 231-233, 242 #56 Teacher Guide: A 227; DU 227; RAL 225, 228; SS 227, 228, 233; TD 226; TS 225, 230, 231; TT 226, 229, 231, 232
6. Describe the relationship between the graph of a line and its equation, including being able to explain the meaning of slope as a constant rate of change and y -intercept in real-world problems.	Student Edition: 27 #13, 28 #15-#18, 31 #1, 32 #8-#11, 33 #13, 34 #26-#27, 37 #16, 42 #1-#2, 43 #4-#5 <i>Share and Summarize</i> 28 Teacher Guide: A 25, 28, 44; AE 27; E 29; I 25; RAL 29; SS 28, 30; TT 25, 28, 38
7. Use symbolic algebra (equations and inequalities), graphs and tables to represent situations and solve problems.	Student Edition: 528-532, 533-535, 540-549, 550-553, 554-560, 564-571, 572-575 Teacher Guide: A 530; ML 531; QC 548, 570; QQ 549, 571; SS 532, 535, 558; TD 551; TS 528, 551, 553; TT 532

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8. Write, simplify and evaluate algebraic expressions (including formulas) to generalize situations and solve problems.	<p>Student Edition: 206-209, 210-213, 214 #3, 215 #8, 219 #7, 220 #9-#12, 225-226, 229-230, 231-233</p> <p>Teacher Guide: A 209; AE 233; I 210; RAL 207, 212, 228; SS 213; TD 226; TS 208, 213; TT 211</p>
9. Solve linear equations and inequalities graphically, symbolically and using technology.	<p>Student Edition: 312-316, 320 #15-#16, 322 #1-#10, 367 #3, 369 #12</p> <p><i>Share and Summarize</i> 316</p> <p><i>Think and Discuss</i> 312, 314</p> <p>Teacher Guide: AE 315; I 312; QQ 324; SS 316; TD 312, 314; TS 314</p>
10. Solve 2 by 2 systems of linear equations graphically and by simple substitution.	<p>Student Edition: 342-345, 346-348, 349-351, 352-355, 361 #3, 362 #5, 363 #8-#11, 368 #11, 369 #25</p> <p><i>Think and Discuss</i> 352, 353</p> <p>Teacher Guide: A 354; AE 350; I 343; RAL 343, 344; SS 351; TD 352, 353; TS 345, 351; TT 346, 350, 352; WU 345</p>
11. Interpret the meaning of the solution of a 2 by 2 system of equations; i.e., point, line, no solution.	<p>Student Edition: <i>Explore</i> 342</p> <p>Teacher Guide: QL 366; RAL 343; TS 345; TT 343; WU 345</p>
12. Solve simple quadratic equations graphically; e.g., $y = x^2 - 16$.	<p>Student Edition: 374-378, 383 #1, 387 #15, 388 #17, 392 #2</p> <p>Teacher Guide: DU 376, 377; QC 389; QQ 389; DD 378; TD 376; TS 378; WU 377</p>
13. Compute and interpret slope, midpoint and distance given a set of ordered pairs.	<p>Student Edition: 24-28, 29-30, 31 #1, 34 #26-#27, 35, 36 #1-#4, 37 #9-#13, 46 #10-#13, 47 #19, 55 #16-#18</p> <p>Teacher Guide: A 25, 28; AE 27, 47; DU 35; MB 26; RAL 29, 37; SS 28, 30; TT 24, 25, 26, 27, 29</p>

STANDARDS	PAGE REFERENCES
<i>Analyze Change</i>	
14. Differentiate and explain types of changes in mathematical relationships, such as linear vs. nonlinear, continuous vs. noncontinuous, direct variation vs. inverse variation.	Student Edition: 413-415, 422 #14-#23 Teacher Guide: RAL 415; SS 415; TT 413
15. Describe and compare how changes in an equation affects the related graphs; e.g., for a linear equation changing the coefficient of x affects the slope and changing the constant affects the intercepts.	Student Edition: 34 #26-#27, 36 #1-#4, 53 #1-#5, 62 #22, 63 #3, 403-406, 407-409, 418 #2-#5, 420 #11, 422 #25, 424 #28 <i>Share and Summarize</i> 38 <i>Think and Discuss</i> 35 Teacher Guide: MB 408; RAL 404, 405, 406, 409; TD 35, 404; TT 36, 404
16. Use graphing calculators or computers to analyze change; e.g., interest compounded over time as a nonlinear growth pattern.	Student Edition: 30 #3-#7, 421 #13, 539 #7 <i>Explore</i> 66
Data Analysis and Probability Standard	
<i>Data Collection</i>	
1. Use, create and interpret scatterplots and other types of graphs as appropriate.	Student Edition: 605-607, 608-612, 614 #5 Teacher Guide: A 612; RAL 609; SS 608, 612; TS 608; TT 605; WU 609
2. Evaluate different graphical representations of the same data to determine which is the most appropriate representation for an identified purpose; e.g., line graph for change over time, circle graph for part-to-whole comparison, scatterplot for relationship between two variants.	Student Edition: 604 #1-#2, 620 #14, 621 #15, 625 #12
3. Differentiate between discrete and continuous data and appropriate ways to represent each.	The concepts of discrete and continuous data can be incorporated in to Lesson 11.2 (pages 602-625).

STANDARDS	PAGE REFERENCES
<i>Statistical Methods</i>	
4. Compare two sets of data using measures of center (mean, mode, median) and measures of spread (range, quartiles, interquartile range, percentiles).	Student Edition: 613 #2-#3, 619 #13, 620 #14, 623 #1 Teacher Guide: A 612; TT 609
5. Explain the mean's sensitivity to extremes and its use in comparison with the median and mode.	See Glencoe's <i>Impact Mathematics Course 1</i> © 2009 Lesson 4.4 (pages 269-282).
6. Make conjectures about possible relationship in a scatterplot and approximate line of best fit.	Student Edition: 613 #2-#3, 619 #13 Teacher Guide: A 612; TT 609
7. Identify different ways of selecting samples, such as survey response, random sample, representative sample and convenience sample.	Student Edition: 621 #15
8. Describe how the relative size of a sample compared to the target population affects the validity of predictions.	See Glencoe's <i>Impact Mathematics Course 1</i> © 2009 Lesson 6.2 (pages 283-293).
9. Construct convincing arguments based on analysis of data and interpretation of graphs.	Student Edition: 602-604, 613 #2, 614 #4, 615 #7, 618 #10-#11, 619 #12, 620 #14, 621 #15, 623 #1 Teacher Guide: QQ 621
<i>Probability</i>	
10. Calculate the number of possible outcomes for a situation, recognizing and accounting for when items may occur more than once or when order is important.	Student Edition: 578-583, 584-588 <i>Share and Summarize</i> 588 <i>Think and Discuss</i> 578 Teacher Guide: AE 586; RAL 590; SS 588; TD 578; TS 579, 584; TT 579, 580
11. Demonstrate an understanding that the probability of either of two disjoint events occurring can be found by adding the probabilities for each and that the probability of one independent event following another can be found by multiplying the probabilities.	Student Edition: 584 #12-#17, 587 #9-#16, 588 #21-#24, 590 #8-#9, 592-600 Teacher Guide: AE 594; SS 584; TS 587