

GLENCOE CORRELATION

PRE-ALGEBRA © 2005

WASHINGTON

Essential Academic Learning Requirements—Mathematics

Benchmark 2—Grade 7

OBJECTIVES	PAGE REFERENCES
1. The student understands and applies the concepts and procedures of mathematics.	
1.1 understand and apply concepts and procedures from number sense	
<i>number and numeration</i>	
demonstrate understanding of integers, fractions, decimals, percents, place value of decimals, and properties of the rational number system using pictures and symbols	SE: 70-84, 281-285, 288-302, 304-308, 318-320, 451 <i>Algebra Activity</i> 158, 286-287 <i>Reading Mathematics</i> 69 <i>Spreadsheet Investigation</i> 303
compare and order integers, fractions, and decimals	SE: 56-61, 64-68, 202, 228-229, 616, 710 <i>Algebra Activity</i> 62-63 <i>Reading Mathematics</i> 269
understand the concepts of prime and composite numbers, factors and multiples, and divisibility rules	SE: 79, 148-157, 159-168, 191-193, 226-230, 285, 730-731 <i>Algebra Activity</i> 231 <i>Reading Mathematics</i> 225
understand and apply the concepts of ratio and direct proportion	SE: 264-268, 270-274, 280, 285, 288-292, 359, 413, 440 <i>Algebra Activity</i> 386 <i>Reading Mathematics</i> 269
<i>computation</i>	
understand operations on non-negative rational numbers	SE: 210-224, 255-256, 553
add, subtract, multiply, and divide non-negative fractions and decimals using rules for order of operation	SE: 220-224, 232-236, 242, 464, 491, 567, 649, 712-716
use mental arithmetic, pencil and paper, calculator, or computer as appropriate to the task involving non-negative rational numbers	SE: 21, 27, 30, 66, 233, 282, 738 <i>Graphing Calculator Investigation</i> 374, 423 <i>Spreadsheet Investigation</i> 22
<i>estimation</i>	
identify situations involving non-negative rational numbers in which estimation is sufficient and computation is not required	SE: 209, 230, 294-297, 397, 437-439
use estimation to predict computation results and to determine the reasonableness of answers involving non-negative rational numbers, <i>for example, estimating a tip</i>	SE: 8-9, 121, 295, 298, 564, 586

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1.2 understand and apply concepts and procedures from measurement	
<i>attributes and dimensions</i>	
understand the concepts of and the relationships among perimeter, area, and volume and how changes in one dimension affect perimeter, area, and/or volume	SE: 132-135, 140-141, 178, 224, 336, 349, 359, 676, 730 <i>Spreadsheet Investigation 137</i>
measure objects and events directly or using indirect methods <i>such as calculating and applying procedures for determining perimeter, area, and volume</i>	SE: 417, 472-475, 486, 590-593, 676 <i>Algebra Activity 39</i>
understand the concept of rate and how to calculate rates and determine units	SE: 100, 131, 135, 172, 187, 264-268, 280, 316
<i>approximation and precision</i>	
understand that precision is related to the unit of measurement used and the calibration of the measurement tool	SE: 590-594, 598
know when to estimate and use estimation to obtain reasonable approximations, <i>for example, estimating the length and width of the playground to approximate its area</i>	SE: 8-9, 121, 209, 230, 234, 294-298, 397, 437-439, 564, 586
<i>systems and tools</i>	
understand the appropriate uses of standard units of measurement for both direct and indirect measurement	SE: 131-135, 234, 720-721 <i>Spreadsheet Investigation 137</i>
understand the relationship among units within both the U.S. and metric systems	SE: 118, 170-172, 184, 718-721, 734
select and use tools that will provide an appropriate degree of precision, <i>for example, using meters vs. kilometers</i>	SE: 590-594, 598
1.3 understand and apply concepts and procedures from geometric sense	
<i>properties and relationships</i>	
use the properties and relationships of plane geometry to describe shapes and figures including angles, degrees in a circle, triangles, isosceles, equilateral, or quadrilateral	SE: 492-497, 500-504, 513-517, 520-525, 527-531, 533-543 <i>Foldables Study Organizer 491</i> <i>Reading Mathematics 526</i>
identify, describe, or draw objects in the surrounding environment in geometric terms, <i>for example, producing a simple scale drawing of a classroom</i>	SE: 495, 497, 502, 506, 513, 529, 539 <i>Algebra Activity 505</i>
understand symmetry, congruence, and similarity	SE: 471-475, 486, 493, 500-504 <i>Algebra Activity 505</i>
perform geometric constructions using a variety of tools and technologies, <i>such as paper folding, computer software, straightedge, compass</i>	SE: 497, 516, 525 <i>Algebra Activity 498-499, 512, 518-519</i>

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<i>locations and transformations</i>	
identify and describe location of objects on coordinate grids in any of the four quadrants	SE: 85-89, 92-93, 506-511, 545-546, 728 <i>Algebra Activity 512</i>
understand and apply simple geometric transformations using combinations of translations (slides), or reflections (flips), or rotations (turns)	SE: 506-511, 545-546 <i>Algebra Activity 512</i>
1.4 understand and apply concepts and procedures from probability and statistics	
<i>probability</i>	
know how to calculate numerical measures of chance for simple events	SE: 310-314, 320, 333, 338, 605 <i>Graphing Calculator Investigation 315</i>
understand procedures for counting outcomes to determine probabilities	SE: 635-639, 641-645 <i>Algebra Activity 640</i>
know how to conduct experiments and simulations and to compare results with mathematical expectations	SE: 311-312 <i>Algebra Activity 180, 656-657</i> <i>Graphing Calculator Investigation 315</i>
<i>statistics</i>	
collect a random sample of data that represents a described population	SE: 312, 314 <i>Algebra Activity 309</i>
organize and display data in appropriate forms, such as frequency tables, circle graphs, and stem-and-leaf plots	SE: 607-615, 617-621, 623-628 <i>Graphing Calculator Investigation 622, 629</i> <i>Spreadsheet Investigation 452</i>
calculate and appropriately use range and measures of central tendency to describe data	SE: 82, 92, 238-242, 248, 252, 258, 605, 611, 618 <i>Graphing Calculator Investigation 243</i>
identify how statistics can be used to support different points of view	SE: 630-633, 639, 645, 660 <i>Algebra Activity 309</i> <i>Reading Mathematics 634</i>
<i>prediction and inference</i>	
predict outcomes of experiments and simulations and compare the predictions to experimental results	SE: 42, 251, 310-314, 320, 395, 409-413 <i>Graphing Calculator Investigation 315</i>
understand and make inferences based on analysis of experimental results, statistical data, and simple graphical representations	SE: 42, 179, 310-314, 320, 395, 409-413 <i>Graphing Calculator Investigation 315</i>
1.5 understand and apply concepts and procedures from algebraic sense	
<i>patterns</i>	
recognize, extend, and create patterns and sequences	SE: 9, 47-48, 55, 74, 84, 102, 167, 249-252, 344 <i>Algebra Activity 253</i>
represent and describe patterns with tables, graphs, and rules	SE: 47-48, 74, 249-253 <i>Algebra Activity 253</i>
<i>representations</i>	
represent equalities and inequalities symbolically using =, >, <, ≤, ≥	SE: 28, 57, 126, 340-344, 361-362, 367, 464 <i>Reading Mathematics 339</i>
use variables to write simple expressions, equations, and inequalities, for example, $3x > 18$	SE: 126-130, 342 <i>Reading Mathematics 125</i>

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<i>operations</i>	
evaluate expressions and formulas	SE: 100, 107, 119, 130, 131-136 <i>Spreadsheet Investigation 137</i>
solve single-variable equations	SE: 110-124, 130, 136, 139-140, 327, 330-338, 361 <i>Algebra Activity 108-109, 328-329</i>
2. The student uses mathematics to define and solve problems.	
2.1 investigate situations	
search systematically for patterns in simple situations	SE: 6-7, 9, 47-48, 84, 102, 167, 249-252
develop and use a variety of strategies and approaches	SE: 5-10, 47-48, 76, 122, 177, 202, 399, 420, 706-709
identify missing or extraneous information	SE: 6, 56, 71, 173, 187, 203, 247, 630-633, 649
recognize the need to modify or abandon an unproductive approach	SE: 6, 33, 72, 128, 212, 234, 630-633
2.2 formulate questions and define the problem	
identify questions to be answered in new situations	SE: 6, 8, 29, 42, 99, 116 <i>Algebra Activity 39</i>
define problems in new situations	SE: 6-8, 70, 119, 127, 187, 350, 369
identify the knowns and unknowns in new situations	SE: 6-8, 106, 112, 127, 187, 234
2.3 construct solutions	
organize relevant information from multiple sources	SE: 40-43, 617, 619-620, 623-628 <i>Graphing Calculator Investigation 45-46, 622, 629</i>
select and use appropriate mathematical tools	SE: 200-201 <i>Algebra Activity 39</i> <i>Graphing Calculator Investigation 45-46, 243, 374</i>
apply viable strategies and appropriate concepts and procedures to construct a solution	SE: 5-10, 37, 47-48, 76, 122, 177, 202, 399, 420, 706-709
3. The student uses mathematical reasoning.	
3.1 analyze information	
compare, contrast, and interpret information from a variety of sources	SE: 40-43, 606-621, 623-628 <i>Graphing Calculator Investigation 622, 629</i>
validate thinking and mathematical ideas using models, known facts, patterns, relationships, and counter-examples	SE: 27, 41, 73, 75, 102, 249
3.2 predict results	
make conjectures based on analysis of new problem situations	SE: 42, 175, 445, 497, 500 <i>Algebra Activity 275</i> <i>Spreadsheet Investigation 22</i>
3.3 draw conclusions and verify results	
test conjectures and explain why they are true or false	SE: 25, 175 <i>Spreadsheet Investigation 22</i>

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support arguments and justify results using evidence	SE: 41-42, 175, 445, 500 <i>Algebra Activity 275</i>
check for reasonableness of results	SE: 8, 121, 187, 295, 298, 586
reflect on and evaluate procedures and results in new problem situations	SE: 6-8, 20, 119, 187, 350, 369
4. The student communicates knowledge and understanding in both everyday and mathematical language.	
4.1 gather information	
develop and follow a plan for collecting information	SE: 43, 610 <i>Algebra Activity 39, 309</i> <i>WebQuest Internet Project 696</i>
use reading, listening, and observation to access and extract mathematical information from multiple sources <i>such as pictures, diagrams, physical models, oral narratives, and symbolic representations</i>	SE: 42, 179, 310-314, 320, 395, 409-413 <i>Graphing Calculator Investigation 315</i>
choose appropriate available technology to browse, select, and retrieve relevant mathematical information from a variety of sources	SE: 43, 68, 114, 119, 157, 396, 587, 610
4.2 organize and interpret information	
organize and clarify mathematical information by reflecting, verbalizing, discussing, or writing	SE: 73, 78, 84, 89, 106, 152, 179, 285, 397, 511
4.3 represent and share information	
clearly and effectively express or present ideas and situations using both everyday and mathematical language <i>such as models, tables, charts, graphs, written reflection, or algebraic notation</i>	SE: 37, 606-611, 617-621, 626-628 <i>Algebra Activity 39</i> <i>Graphing Calculator Investigation 622, 629</i>
explain or represent mathematical ideas and information in ways appropriate for audience and purpose	SE: 73, 78, 84, 89, 106, 152, 179, 285, 397, 511
5. The student understands how mathematical ideas connect within mathematics, to other subject areas, and to real-life situations.	
5.1 relate concepts and procedures within mathematics	
relate and use conceptual and procedural understandings among a variety of mathematical content areas	SE: 460-464, 533-537, 612-616, 650-655, 674-677, 687-690
relate and use different mathematical models and representations of the same situation	SE: 66, 98-99, 200
5.2 relate mathematical concepts and procedures to other disciplines	
identify mathematical patterns and ideas in other disciplines	SE: 20, 35, 37, 66, 129, 151
use mathematical thinking and modeling in other disciplines	SE: 10, 23, 42, 56, 73, 157 <i>Graphing Calculator Investigation 45-46</i>

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describe examples of contributions to the development of mathematics <i>such as the contributions of women, men, and different cultures</i>	SE: 253, 460 <i>Algebra Activity 640</i>
5.3 relate mathematical concepts and procedures to real-life situations	
recognize the widespread use of mathematics in daily life and the extensive use of mathematics outside the classroom, <i>for example, in banking or sports statistics</i>	SE: 42, 242, 278, 339, 348, 399, 472, 515, 649
investigate the use of mathematics within several occupations/careers of interest	SE: 42, 73, 129, 172, 223, 278, 339, 348, 358, 480