GLENCOE CORRELATION
ALGEBRA 1 © 2003
WASHINGTON
Essential Academic Learning Requirements—Mathematics
Benchmark 3—Grade 10

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	
number and numeration	
understand and use properties and symbolic representations of rational numbers, powers, and roots	SE: 6-9, 11-15, 21-25, 26-31, 32-36, 103-109 TWE: ICE 6-7, 22, 27, 104-106
compare and order rational numbers, powers, and roots	SE: 90-94, 105-109 *Getting Started* 707 *Prerequisite Skills* 818-819 TWE: ICE 105-106
understand concepts of and use processes involving prime and composite numbers, factors and multiples, and divisibility	SE: 6-9, 474-479 TWE: F 474 ICE 475-476 SN 477
understand and apply the concepts of ratio and both direct and inverse proportion	SE: 155-159, 160, 616-621, 623-630, 642-647 *Getting Started* 585 *Prerequisite Skills* 802-803 TWE: F 155 ICE 156-157, 617-618
computation	
understand operations on rational numbers, powers, and roots	SE: 6-9, 11-15, 16-20, 73-78, 79-83, 84-87, 103-109 TWE: ICE 12, 74-75, 80
compute with rational numbers, powers, and roots	SE: 6-9, 11-15, 16-20, 73-78, 79-83, 84-87, 103-109 TWE: ICE 12, 74-75, 80
use mental arithmetic, pencil and paper, calculator, or computer as appropriate to the task involving real numbers	SE: 73-78, 79-83, 84-87, 103-109, 160-164, 586-592, 593-597 TWE: ICE 85, 587-589, 594
estimation	
identify situations involving rational numbers, powers, and roots in which estimation is sufficient and computation is not required	SE: 535 TWE: TNT 106
use estimation to predict computation results and to determine the reasonableness of answers involving real numbers, *for example, estimating*	See Glencoe's *Algebra: Concepts and Applications* © 2004 SE: 24, 85 #44, 259 #9, 315 #39, 340 #43, 365 #37, 469-470 *Hands-On Algebra* 224, 362 TWE: TT 72

OBJECTIVES	PAGE REFERENCES
1.2 understand and apply concepts and procedures from measurement	
attributes and dimensions	
understand how changes in dimension affect perimeter, area, and volume	See Glencoe's *Algebra: Concepts and Applications* © 2004 SE: 27 #6, 29 #16, 439 #50, 654 #30 *Graphing Calculator Exploration* 338-339 *Hands-On Algebra* 25
measure objects and events directly or use indirect methods *such as finding the volume of a cone given its height and diameter*	SE: 616-621, 623-630 *Prerequisite Skills* 812-814, 815-817 TWE: DI 618 ICE 617-618, 625-626
calculate rate and other derived and indirect measurements	SE: 157-159 TWE: ICE 157
approximation and precision	
understand that the precision and accuracy of measurement are affected by the measurement tools and calculating procedures	SE: *Algebra Activity* 626
know when to estimate and use estimation to obtain reasonable approximations, *for example, estimating how much paint is needed to paint the walls of a classroom*	SE: 618-620, 625-630 TWE: ICE 618
systems and tools	
understand the benefits of standard units of measurement and the advantages of the metric system	See Glencoe's *Algebra: Concepts and Applications* © 2004 SE: 190, 192 #39-46, 194-195, 344 #15 *Investigation* 262-263 TWE: TT 352
compare, contrast, and use both the U.S. system and metric system	See Glencoe's *Algebra: Concepts and Applications* © 2004 SE: 174 #36, 190, 192 #39-46, 194-195, 344 #15 TWE: TT 352
select and use tools that will provide an appropriate degree of precision and accuracy for the situation, *for example, using kilometers vs. light years*	SE: *Algebra Activity* 626
1.3 understand and apply concepts and procedures from geometric sense	
properties and relationships	
use geometric properties and relationships to compare, contrast, describe, and classify 2- and 3-dimensional geometric figures	SE: 292-297 *Prerequisite Skills* 810-811, 812, 813-814, 815-817
construct geometric models and scale drawings using tools as appropriate, *for example, building a model of a bridge*	See Glencoe's *Algebra: Concepts and Applications* © 2004 SE: 194-195, 261 #54, 571 #50 *Hands-On Algebra* 141 *Investigation* 426-427, 540-541

OBJECTIVES	PAGE REFERENCES
understand and use properties of symmetry, congruence, and similarity	SE: 197-203, 525-530 *Algebra Activity* 525 *Prerequisite Skills* 810-811 TWE: AA 525 ICE 525-526
perform complex geometric constructions using a variety of tools and technologies*, such as paper folding, computer software, straightedge, compass*	See Glencoe's *Algebra: Concepts and Applications* © 2004 SE: 200 #6 *Hands-On Algebra* 25 *Investigation* 30-31, 308-309, 612-613
locations and transformations	
understand and use coordinate grids	SE: 192-196, 197-203, 205-211, 212-217, 218-223, 298-305, 369-374 *Graphing Calculator Investigation* 204 TWE: ICE 193, 206-207
understand and apply multiple geometric transformations using combinations of translations, reflections, and/or rotations	SE: 197-203, 415 *Graphing Calculator Investigation* 545, 556 TWE: DI 199 F 197 ICE 198-202
1.4 understand and apply concepts and procedures from probability and statistics	
probability	
understand the properties of dependent and independent events	SE: 769-776 TWE: ICE 770-772
understand and use appropriate counting procedures to determine probabilities	SE: 96-101, 754-758, 760-767, 777-780 *Algebra Activity* 102 TWE: ICE 97-98, 755-756, 761-763 OEA 758 TNT 97
use both experimental and theoretical methods to determine probabilities	SE: 782-788 TWE: ICE 783-784
statistics	
collect data using appropriate methods and technology	SE: *Algebra Activity* 299
organize and display data in appropriate forms, *such as tables, graphs, scatter plots, and box and whisker plots*	SE: 50-55, 88-94, 298-305, 722-728 *Spreadsheet Investigation* 56 TWE: ICE 52, 89-90, 299-300, 724 OEA 55
calculate and use the different measures of central tendency, variability, and range as appropriate to describe data	SE: 90-94, 731-736, 818-819 TWE: ICE 91, 732-733
use statistics to support different points of view, *for example, in a debate or a position paper*	SE: 708-713 *Reading Mathematics* 714
prediction and inference	
predict outcomes and design and conduct experiments to verify or disprove predictions	SE: 300-305 *Graphing Calculator Investigation* 306-307 TWE: ICE 301

OBJECTIVES	PAGE REFERENCES
understand and make inferences based on the analysis of experimental results, statistical data, and graphical representations	SE: 51-55 TWE: ICE 51-52
1.5 understand and apply concepts and procedures from algebraic sense	
patterns	
recognize, extend, and create complex patterns and sequences	SE: 233-238, 240-245, 567-571 TWE: F 567 ICE 234-235, 241-242, 568-570
generalize and express rules describing patterns and sequences	SE: 233-238, 240-245, 569-571 *Spreadsheet Investigation* 232 TWE: F 240 ICE 235, 242
representations	
translate among tabular, symbolic, and graphical representations of relations using =, ≠, >, <, ≥, ≤	SE: 205-210, 212-217, 218-223, 352-357 *Graphing Calculator Investigation* 204, 358 TWE: ICE 206-207, 214, 219-220, 353-354
use variables to write expressions, equations, and inequalities	SE: 6-9, 16-20, 34-35, 120-125, 320-322 TWE: ICE 6-7, 17, 34, 121-123, 320
operations	
simplify and evaluate expressions and formulas	SE: 11-15, 26-31, 32-36, 80-82, 85-87, 166-170 TWE: ICE 12, 85, 167 OEA 170
solve equations and inequalities	SE: 16-20, 128-134, 135-140, 142-148, 318-323, 325-331, 332-337 *Algebra Activity* 141 TWE: ICE 136-137, 143-144
2. The student uses mathematics to define and solve problems.	
2.1 investigate situations	
search systematically for patterns in complex situations	SE: 292-297, 369-373, 549, 567-571 *Algebra Activity* 573 TWE: F 292, 568-570
use multiple strategies	SE: 121-125, 142-147, 157-159, 535-537, 539-543, 557-559 *Mixed Problem Solving* 853-866 *Reading Mathematics* 165 TWE: ICE 143-144, 534-535
identify what information is missing or extraneous and compensate for it	SE: *WebQuest* 3, 189, 407, 583, 705
analyze an unproductive approach and attempt to modify it or try a new approach	SE: 376, 548-552 TWE: TNT 548
2.2 formulate questions and define the problem	
identify questions to be answered in complex situations	SE: 75-77, 121-125, 561-565, 625-630, 691-695 *WebQuest* 3, 189, 407, 583, 705 TWE: ICE 626, 691-692
define problems in complex situations	SE: 121-125, 625-630, 691-695 *WebQuest* 3, 189, 407, 583, 705 TWE: ICE 626, 691-692

OBJECTIVES	PAGE REFERENCES
identify the information that is known and unknown in complex situations	SE: 121-125, 161-163, 625-630, 691-695 *WebQuest* 3, 189, 407, 583, 705 TWE: ICE 691-692
2.3 construct solutions	
organize and synthesize information from multiple sources	SE: *WebQuest* 3, 189, 407, 583, 705
select and use appropriate mathematical tools	SE: 533-537 *Algebra Activity* 127, 141, 626 *Graphing Calculator Investigation* 531-532, 553 *WebQuest* 3, 189, 407, 583, 705
apply viable strategies and appropriate concepts and procedures to construct a solution	SE: 75-77, 161-163, 625-630, 691-695 *WebQuest* 3, 189, 407, 583, 705 TWE: ICE 625-626
3. The student uses mathematical reasoning.	
3.1 analyze information	
compare, contrast, interpret, and integrate information from multiple sources	SE: 50-55 *Algebra Activity* 49, 141, 278-279 *WebQuest* 3, 189, 407, 583, 705
validate thinking and mathematical ideas using models, known facts, patterns, relationships, counterexamples, and proportional reasoning	SE: 37-42 *Algebra Activity* 49, 141, 232 *Reading Mathematics* 239 *WebQuest* 3, 189, 407, 583, 705
3.2 predict results	
make and explain conjectures based on analysis of problem situations	SE: *Algebra Activity* 28, 49, 127, 232, 278-279, 299, 376, 501, 743-744
3.3 draw conclusions and verify results	
test conjectures by formulating a proof or by constructing a counterexample	SE: 37-42 TWE: E 40 ICE 39 OEA 42
support arguments and justify results using inductive and deductive reasoning	SE: 37-42 TWE: ICE 38-39 OEA 42
check for reasonableness of results	SE: 75, 121, 157, 213-214, 274, 282, 300-301, 371, 445, 541
reflect on and evaluate procedures and results and make necessary revisions	SE: *Check for Understanding* 29, 162, 259, 289, 329, 384, 413, 421, 441, 504
4. The student communicates knowledge and understanding in both everyday and mathematical language.	
4.1 gather information	
develop or select and follow an efficient system for collecting information	SE: *Algebra Activity* 271, 416, 622 *WebQuest* 3, 189, 407, 583, 705
use reading, listening, and observation to access and extract mathematical information from multiple, self-selected sources *such as pictures, diagrams, physical models, oral narratives, and symbolic representations*	SE: *Algebra Activity* 416, 622 *WebQuest* 3, 189, 407, 583, 705

OBJECTIVES	PAGE REFERENCES
integrate the use of a variety of available technologies to browse, select, and retrieve mathematical information from multiple sources	SE: *WebQuest* 3, 189, 407, 583, 705
4.2 organize and interpret information	
organize, clarify, and refine mathematical information in multiple ways - reflecting, verbalizing, discussing, or writing	SE: *Algebra Activity* 49, 271 *WebQuest* 3, 189, 407, 583, 705
4.3 represent and share information	
express complex ideas and situations using mathematical language and notation in appropriate and efficient forms	SE: *WebQuest* 3, 189, 407, 583, 705
explain or represent complex mathematical ideas and information in ways appropriate for audience and purpose	SE: *WebQuest* 3, 189, 407, 583, 705
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 multiple mathematical content strands	SE: 50-55, 88-94, 96-101, 292-297, 298-305, 623-630, 715-721, 722-728, 731-736, 737-742
relate and use multiple equivalent mathematical models and representations	SE: 50-55, 88-94, 292-297, 616-620, 623-630 *Algebra Activity* 743-744 TWE: F 50, 292 ICE 618
5.2 relate mathematical concepts and procedures to other disciplines	
extend mathematical patterns and ideas to other disciplines	SE: 135-139, 155-159, 240, 425-430, 561-565 TWE: F 135, 155, 240
apply mathematical thinking and modeling in other disciplines	SE: 226, 325, 332, 548, 561-565, 661 TWE: F 226, 325, 332 ICE 548
describe examples of contributions to the development of mathematics *such as the contributions of women, men, and different cultures*	See Glencoe's *Algebra: Concepts and Applications* © 2004 SE: 146, 194, 366, 425 #56 *Investigation* 410-411
5.3 relate mathematical concepts and procedures to real-life situations	
identify situations in which mathematics can be used to solve problems with local, national, or international implications *such as calculating resources necessary for interstate highway maintenance*	SE: 75, 157, 173, 212-214, 345 TWE: F 345 ICE 75, 157, 173, 214
investigate the mathematical knowledge and training requirements for occupational/career areas of interest	SE: *Career Choices* 13, 75, 269, 340, 397, 460, 485, 591, 649, 782

Codes Used for TWE Pages

AA	Algebra Activity
DI	Differentiated Instruction
E	Enrichment
F	Focus
ICE	In-Class Examples
OEA	Open-Ended Assessment
SN	Study Notebook
TNT	Tips for the New Teacher