



COLORADO
Content Standards Mathematics Grades 9-12
Algebra 2 © 2005

OBJECTIVES	PAGE REFERENCES
STANDARD 1: Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems. In order to meet this standard, a student will	
<ul style="list-style-type: none"> construct and interpret number meanings through real-world experiences* and the use of hands-on materials; 	SE: 11-18, 28-32, 225-228, 245-249, 270-275, 531-537 <i>Algebra Activity 19</i>
<ul style="list-style-type: none"> represent and use numbers in a variety of equivalent forms (<i>for example, fractions, decimals, percents, exponents*, scientific notation*</i>); 	SE: 225-228, 245-249, 257-262 <i>Prerequisite Skills 814</i> TWE: ICE 225, 246-247, 258-260
<ul style="list-style-type: none"> know the structure and properties of the real number system* (<i>for example, primes*, factors, multiples, relationships among sets of numbers</i>); and 	SE: 11-18, 239, 245-249 <i>Prerequisite Skills 814, 815, 816</i> TWE: ICE 12
<ul style="list-style-type: none"> use number sense, including estimation and mental arithmetic, to determine the reasonableness of solutions. 	SE: 29, 225, 313-319, 361-364, 533-538, 560-564 TWE: ICE 225, 314-315, 361, 561-562
GRADES 9-12 As students in grades 9-12 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> demonstrating meanings for real numbers, absolute value*, and scientific notation using physical materials and technology in problem-solving situations; 	SE: 11-18, 28-32, 225-228 TWE: F 28 ICE 12-14 OEA 32
<ul style="list-style-type: none"> developing, testing, and explaining conjectures about properties of number systems and sets of numbers; and 	SE: 11-18 TWE: ICE 12-13
<ul style="list-style-type: none"> using number sense to estimate and justify the reasonableness of solutions to problems involving real numbers. 	SE: 29, 225, 313-319, 361-364, 533-538, 560-564 TWE: ICE 225, 314-315, 361, 561-562
STANDARD 2 Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems. In order to meet this standard, a student will	
<ul style="list-style-type: none"> identify, describe, analyze, extend, and create a wide variety of patterns in numbers, shapes, and data; 	SE: 347-352, 578-582, 588-592, 599-603, 612-616 <i>Graphing Calculator Investigation 593</i> TWE: ICE 347, 579, 589, 613

OBJECTIVES	PAGE REFERENCES
<ul style="list-style-type: none"> describe patterns using mathematical language; 	SE: 578-582, 583-587, 588-592, 594-598, 599-603, 606-610 TWE: ICE 579-580, 589-590, 613-615 OEA 582
<ul style="list-style-type: none"> solve problems and model real-world situations using patterns and functions; 	SE: 578-582, 583-587, 588-592, 594-598, 599-603 TWE: F 594 ICE 578, 584, 595
<ul style="list-style-type: none"> compare and contrast different types of functions; and 	SE: 63-67, 89-95, 286-293, 523-530, 531-538, 739-745, 762-768 TWE: ICE 64, 90-92, 525
<ul style="list-style-type: none"> describe the connections among representations of patterns and functions, including words, tables, graphs, and symbols. 	SE: 56-62, 89-95, 313-319, 322-327, 499-504, 523-530, 762-768 <i>Graphing Calculator Investigation</i> 320-321 TWE: ICE 58-59, 90-92
GRADES 9-12	
As students in grades 9-12 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> modeling real-world phenomena (<i>for example, distance-versus-time relationships, compound interest, amortization tables, mortality rates</i>) using functions, equations, inequalities, and matrices*; 	SE: 154-158, 160-166, 286-293, 560-564 <i>Graphing Calculator Investigation</i> 87-88, 539-540 <i>Spreadsheet Investigation</i> 159, 605 TWE: ICE 289, 561-562
<ul style="list-style-type: none"> representing functional relationships using written explanations, tables, equations, and graphs, and describing the connections among these representations; 	SE: 56-62, 89-95, 286-293, 294-299, 499-504, 523-530, 762-768 TWE: ICE 58-59, 90-92, 524-525
<ul style="list-style-type: none"> solving problems involving functional relationships using graphing calculators and/or computers as well as appropriate paper-and-pencil techniques; 	SE: 63-67, 89-95, 313-319, 395-399 <i>Graphing Calculator Investigation</i> 552-553, 798 TWE: ICE 64, 90-92, 314-316, 396-397
<ul style="list-style-type: none"> analyzing and explaining the behaviors, transformations*, and general properties of types of equations and functions (<i>for example, linear, quadratic*, exponential*</i>); and 	SE: 63-67, 286-293, 322-327, 346-352, 523-530, 769-776 <i>Graphing Calculator Investigation</i> 320-321 TWE: F 322 ICE 347-349, 771
<ul style="list-style-type: none"> interpreting algebraic equations and inequalities geometrically and describing geometric relationships algebraically. 	SE: 33-39, 40-46, 306-312, 360-364, 701-708 <i>Prerequisite Skills</i> 817-819, 820-821
STANDARD 3:	
Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.	
In order to meet this standard, a student will	
<ul style="list-style-type: none"> solve problems by systematically collecting, organizing, describing, and analyzing data using surveys, tables, charts, and graphs; 	SE: 81-86, 664-669, 671-675 <i>Algebra Activity</i> 522, 681 <i>Getting Started</i> 631 <i>Prerequisite Skills</i> 824-827 TWE: ICE 82-83, 672
<ul style="list-style-type: none"> make valid inferences, decisions, and arguments based on data analysis; and 	SE: 81-86, 664-669 <i>Graphing Calculator Investigation</i> 87-88 TWE: ICE 82-83

OBJECTIVES	PAGE REFERENCES
<ul style="list-style-type: none"> use counting techniques, experimental probability, or theoretical probability, as appropriate, to represent and solve problems involving uncertainty. 	SE: 632-636, 638-642, 644-649, 651-657 TWE: F 632, 644 ICE 633-634, 639-640, 645-646 OEA 650
GRADES 9-12	
As students in grades 9-12 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> designing and conducting a statistical experiment to study a problem, and interpreting and communicating the results using the appropriate technology (<i>for example, graphing calculators, computer software</i>); 	SE: <i>Algebra Activity</i> 83, 522, 681
<ul style="list-style-type: none"> analyzing statistical claims for erroneous conclusions or distortions; 	SE: 682-685
<ul style="list-style-type: none"> fitting curves to scatter plots, using informal methods or appropriate technology, to determine the strength of the relationship between two data sets and to make predictions; 	SE: 81-86 <i>Graphing Calculator Investigation</i> 87-88 TWE: ICE 82-83
<ul style="list-style-type: none"> drawing conclusions about distributions of data based on analysis of statistical summaries (<i>for example, the combination of mean and standard deviation, and differences between the mean and median</i>); 	SE: 664-669, 671-675 TWE: ICE 672
<ul style="list-style-type: none"> using experimental and theoretical probability to represent and solve problems involving uncertainty (<i>for example, the chance of playing professional sports if a student is a successful high school athlete</i>); and 	SE: 644-649, 651-657, 658-662
<ul style="list-style-type: none"> solving real-world problems with informal use of combinations and permutations* (<i>for example, determining the number of possible meals at a restaurant featuring a given number of side dishes</i>). 	SE: 638-642 TWE: ICE 639-640
STANDARD 4: Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems. In order to meet this standard, a student will	
<ul style="list-style-type: none"> connect various physical objects with their geometric representation; 	See Glencoe's <i>Geometry</i> © 2004. SE: 49 #15-18, 189 #11-14, 212 #29, 251 #16, 271 #9, 304 #41-42, 321 #28, 355 #40-43, 607 #38-39, 665 #32
<ul style="list-style-type: none"> connect mathematical concepts from across the standards with their geometric representations; 	SE: 184-187, 412-416, 701-708 <i>Algebra Activity</i> 252, 417 <i>Spreadsheet Investigation</i> 700
<ul style="list-style-type: none"> recognize, draw, describe, and analyze geometric shapes in one, two, and three dimensions; 	SE: 701-708 <i>Getting Started</i> 699 <i>Prerequisite Skills</i> 817-819, 820-821 TWE: ICE 702-705

OBJECTIVES	PAGE REFERENCES
<ul style="list-style-type: none"> make, investigate, and test conjectures about geometric ideas; and 	See Glencoe's <i>Geometry</i> © 2004. SE: 62-66, 94-100, 101-106, 107-114 <i>Geometry Activity</i> 22, 28, 32, 38, 184 <i>Geometry Software Investigation</i> 101
<ul style="list-style-type: none"> solve problems and model real-world situations using geometric concepts. 	SE: 701-708 TWE: ICE 702-705
GRADES 9-12 As students in grades 9-12 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> finding and analyzing relationships among geometric figures using transformations (<i>for example, reflections, translations, rotations, dilations*</i>) in coordinate systems*; 	See Glencoe's <i>Geometry</i> © 2004. SE: 463-469, 470-475, 476-482, 483-488, 490-497, 498-505 <i>Geometry Activity</i> 462, 506-511 TWE: UM 466
<ul style="list-style-type: none"> deriving and using methods to measure perimeter, area, and volume of regular and irregular geometric figures; 	SE: 8-10, 184-187, 378-381 TWE: ICE 8, 185, 379
<ul style="list-style-type: none"> making and testing conjectures about geometric shapes and their properties, incorporating technology where appropriate; and 	See Glencoe's <i>Geometry</i> © 2004. SE: 140, 298, 404 <i>Construction</i> 200, 202, 207 <i>Geometry Activity</i> 184, 365, 524, 672 <i>Geometry Software Investigation</i> 384
<ul style="list-style-type: none"> using trigonometric ratios* in problem-solving situations (<i>for example, finding the height of a building from a given point, if the distance to the building and the angle of elevation are known</i>). 	SE: 701-708 TWE: ICE 702-705
STANDARD 5: Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems. In order to meet this standard, a student will	
<ul style="list-style-type: none"> understand and apply the attributes of length, capacity*, weight, mass, time, temperature, perimeter, area, volume, and angle measurement in problem-solving situations; 	SE: 8-10, 184-187, 378-381, 701-708, 709-714, 725-732 TWE: ICE 8, 185, 379, 704-705, 711
<ul style="list-style-type: none"> make and use direct and indirect measurements to describe and compare real-world phenomena; 	SE: 701-708, 709-714, 725-732, 733-738 <i>Prerequisite Skills</i> 817-819, 820-821 TWE: ICE 703-705, 711, 729, 735
<ul style="list-style-type: none"> understand the structure and use of systems of measurement; 	SE: 701-708, 709-714
<ul style="list-style-type: none"> describe and use rates of change (<i>for example, temperature as it changes throughout the day, or speed as the rate of change of distance over time</i>) and other derived measures; and 	SE: 68-74, 560-564 TWE: ICE 69, 561-562
<ul style="list-style-type: none"> select appropriate units, including metric and U. S. customary, and tools (<i>for example, rulers, protractors, compasses, thermometers</i>) to measure to the degree of accuracy required to solve a given problem. 	See Glencoe's <i>Geometry</i> © 2004. SE: 13-19, 29-36 <i>Geometry Activity</i> 38, 365 TWE: DI 300, 372 TT 375

OBJECTIVES	PAGE REFERENCES
GRADES 9-12	
As students in grades 9-12 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> measuring quantities indirectly using techniques of algebra, geometry, or trigonometry*; 	SE: 412-416, 701-718, 719-724, 725-732, 733-738 TWE: ICE 413, 703-705, 711-712, 726-729, 734-735
<ul style="list-style-type: none"> selecting and using appropriate techniques and tools to measure quantities in order to achieve specified degrees of precision, accuracy, and error (or tolerance) of measurements; and 	SE: 412-416, 701-708, 725-732, 733-738 TWE: ICE 413, 703-705, 726-729, 734-735
<ul style="list-style-type: none"> determining the degree of accuracy of a measurement (<i>for example, by understanding and using significant digits</i>). 	See Glencoe's <i>Geometry</i> © 2004. SE: 14, 17 #16-21, 18 #50
STANDARD 6: Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems. In order to meet this standard, a student will	
<ul style="list-style-type: none"> model, explain, and use the four basic operations - addition, subtraction, multiplication, and division - in problem-solving situations; 	SE: 14-17, 23-27, 36-39, 64-67, 160-166, 167-173 TWE: ICE 14, 23, 36, 64
<ul style="list-style-type: none"> develop, use, and analyze algorithms*; and 	SE: 28-32, 33-39, 160-166, 167-173, 182-188, 250-255, 257-262, 365-370, 479-484, 492-498
<ul style="list-style-type: none"> select and apply appropriate computational techniques to solve a variety of problems and determine whether the results are reasonable. 	SE: 28-32, 116-122, 189-194, 313-319, 733-738 TWE: ICE 29, 116-119, 190-191, 314-316, 734-735
GRADES 9-12	
As students in grades 9-12 extend their knowledge, what they know and are able to do includes	
<ul style="list-style-type: none"> using ratios, proportions, and percents in problem-solving situations; 	SE: 68-74, 492-498, 507-511, 701-708, 725-732 <i>Getting Started</i> 471 TWE: ICE 69, 493-494, 507, 704-705
<ul style="list-style-type: none"> selecting and using appropriate methods for computing with real numbers in problem-solving situations from among mental arithmetic, estimation, paper-and-pencil, calculator, and computer methods, and determining whether the results are reasonable; and 	SE: 129-134, 202-207, 492-498, 560-564, 701-708 TWE: ICE 131, 203, 494, 561-562, 704-705
<ul style="list-style-type: none"> describing the limitations of estimation, and assessing the amount of error resulting from estimation within acceptable limits. 	SE: 296-299 TWE: ICE 296

Codes Used for TWE Pages

F	Focus
ICE	In-Class Examples
OEA	Open-Ended Assessment