

TABLE OF CONTENTS - Grade 7

	PAGES
Chapter 1: Stem And Leaf-Plot	1
Cumulative Review	1
How to Make a Stem-and-Leaf Plot	1
Back-to-Back Stem-and-Leaf Plot	5
How to Make a Back-to-Back Stem-and-Leaf Plot	5
Chapter 2: Box-And-Whisker Plot	12
How to Make a Box-and-Whisker Plot.....	12
Critical Thinking	13
Group Exercises.....	17
Comparing Data Sets Using Box-and-Whisker Plot	21
Chapter 3: Order of Operations	26
Quick Cumulative Review	26
Order of Operations	27
Explaining the Order of Operations	27
Addition and Subtraction	28
Multiplication and Division.....	29
Addition, Subtraction, Multiplication, and Division.....	29
Addition, Subtraction, Multiplication, Division, and Parentheses	31
Addition, Subtraction, Multiplication, Division, Parentheses, Exponents and Roots	33
Quick Review	33
Extension of the Order of Operations Using PERMDAS.....	37
Fraction Bar	37
Parentheses, Parenthesis, and Brackets.....	39
Chapter 4: Percent	41
Percent Concept.....	41
Team Exercise	42
Express Percent as a Fraction.....	43
Team Exercise	43
REAL WORLD APPLICATIONS - WORD PROBLEMS	48
Express Percent as a Fraction.....	48
Express Fractions as Percents.....	50
REAL WORLD APPLICATIONS - WORD PROBLEMS	52
Express Fractions as Percents.....	52
Express Percent as a Decimal	54

REAL WORLD APPLICATIONS - WORD PROBLEMS	57
Percent to Decimal Fractions.....	57
Express Decimal Fractions as Percents.....	58
REAL WORLD APPLICATIONS - WORD PROBLEMS	61
Express Decimal Fractions as Percents.....	61
Key Facts - Summary.....	63
Understanding 100%.....	67
Understanding Percent.....	68
REAL WORLD APPLICATIONS - WORD PROBLEMS	68
Understanding Percent.....	68
Fractional Parts of Percent	70
REAL WORLD APPLICATIONS - WORD PROBLEMS	73
Express Fractions of Percents as Decimals	73
FRACTIONAL PARTS OF PERCENTS - Alternative Method	76
Find the Percent of a Number	77
REAL WORLD APPLICATIONS - WORD PROBLEMS	81
To Find the Percent of a Number	81
Percent of One Number Compared to Another Number	85
REAL WORLD APPLICATIONS - WORD PROBLEMS	87
Percent of One Number Compared to Another Number	87
Explanation of Percent Rate, Base, and Percentage.....	90
Finding a Number When a Percent of it is Known.....	91
Equation Method	91
Proportion Method	92
Summary of the Equation Method.....	97
Summary of the Proportion Method.....	98
REAL WORLD APPLICATIONS - WORD PROBLEMS	100
Finding a Number When a Percent of it is Known.....	100
REAL WORLD APPLICATIONS - WORD PROBLEMS	102
Percent of Increase or Decrease	102
Percent of Increase	102
Alternative Method: Shortcut Method.....	104
Group Exercise.....	105
Percent of Decrease.....	105
Alternate Method-Shortcut Method.....	107
Group Project	108
Cumulative Review	109
More Cumulative Review.....	110
Chapter 5: Power of Numbers	111

Chapter 6: Exponents	115
Multiplying Powers With the Same Base.....	115
Dividing Powers With the Same Base.....	117
Zero Power.....	118
Negative Exponents and Dividing With Exponent.....	120
Chapter 7: Scientific Notation	128
How to Write Scientific Notations of Numbers Less Than 1	132
How to Write Scientific Notation in the Standard Notation	133
Chapter 8: Average, Mean, Range, Mode, And Median	137
Explanation 1	137
Explanation 2.....	138
Understanding Average.....	139
Group Exercise.....	139
Mean, Range, Mode, and Median.....	142
Group Exercise.....	143
Group Exercise.....	144
Special Method for Finding Median	144
How to Solve Multi-Step Problems Involving Mean	144
REAL WORLD APPLICATIONS - WORD PROBLEMS	147
Chapter 9: Algebraic Expression	148
Complex Word Phrases.....	149
Key Points.....	150
Evaluation of Expressions	151
Chapter 10: Equations	153
Group Exercise.....	153
Solving Equations Using Addition	153
Addition Property of Equality	154
Solving Equations Using Subtraction.....	155
Subtraction Property of Equality.....	155
Applications.....	156
Solving Equations by Dividing	158
Division Property of Equality	158
Solving Equations by Multiplication	159
Multiplication Property of Equality.....	159
Applications.....	162
Solving Two-Step Equations.....	164

REAL WORLD APPLICATION - WORD PROBLEMS	166
Applications and Solving Two-step Equations	166
MULTI-STEP EQUATION SOLVING	172
Equations with Like Terms or Variables	172
Distributive Property with Equations	178
Distributive Law with a Positive on the Outside	179
Distributive Law with a Negative on the Outside	179
Distributive Law with Equations	181
Group Exercises	187
REAL WORLD APPLICATIONS - WORD PROBLEMS	188
Group Review	188
Cumulative Review	191
Chapter 11: Inequality	192
How to Graph the Solutions of Inequalities on the Number Line	193
Exercises or Group Exercises	195
How to Solve Inequalities	196
Cumulative Review	200
SOLVING MULTI-STEP INEQUALITIES	201
Solving Two-step Inequalities	201
How to Solve Multi-step Inequalities	205
Chapter 12: Square Roots	212
Important Rules	213
Notes	214
How to Solve Expressions Involving the Square Root Symbol	214
REAL WORLD APPLICATION - WORD PROBLEMS	216
Square Roots	216
Cumulative Review	217
SQUARE ROOT OF PERFECT SQUARES	217
Review	217
How to find the Positive and Negative Square Roots of a Number	218
How to Evaluate Expressions Involving Square Roots	219
REAL WORLD APPLICATIONS - WORD PROBLEMS	221
Square Roots of Perfect Squares	221
Special Properties of Square Roots	226
SIMPLIFYING RADICALS - MORE ON SQUARE ROOTS	227
How to Add or Subtraction Expressions that Contain Radicals	227
Multiplication Property of Square Roots	232
Special Note - Square-Root Expression Simplification Conditions	234
Division Property of Square Roots	236
SQUARE ROOTS OF NON-PERFECT SQUARES	238

How to Estimate the Square Roots of Non-perfect Squares	238
How to Use the Calculator to Estimate the Value of a Square Root.....	239
CUBE ROOT	242
Table of Powers Involving Square and Cube	244
Volume of a Cube.....	245
Chapter 13: Ratios	247
More Ratio Concepts	248
REAL WORLD APPLICATIONS - WORD PROBLEMS	248
EQUIVALENT RATIOS	253
Understanding the Concept of Equivalent Ratios	254
Cross Product Methods.....	255
Inspection Method	255
Cross Product Methods.....	256
Inspection Method	256
Alternative Method.....	259
Alternative Method.....	260
PROPORTION	262
Property of Proportion.....	263
Summary.....	263
General Order of a Proportion for Solving Word Problems	269
REAL WORLD APPLICATIONS - WORD PROBLEMS	270
Proportion.....	270
Chapter 14: Rates	278
Group Exercise.....	278
Distance-Time Graph	280
REAL WORLD APPLICATIONS - WORD PROBLEMS	284
Rates.....	284
Cumulative Review	291
Chapter 15: Variations	291
DIRECT VARIATION	291
How to determine Whether a Data Set Varies Directly.....	292
Algebraic Method	293
Graphical Method.....	293
How to Find the Constant of Variation and How to Write an Equation of Direct Variation	294
How to Find the Unknown Variable in Direct Variations.....	295
INVERSE VARIATION	298

How to Tell if Each Relationship From a Table is an inverse or not, and How to Write an Equation of the Relation.....	298
How to Write an Equation that Shows How y is Related to x When Given That y Varies Inversely as x and the Values of x and y are Given.....	300
How to Graph Inverse Variation Functions	301
How to Find x or y in an Inverse Variation	305
REAL WORLD APPLICATION OF VARIATIONS - WORD PROBLEMS.....	308
Boyle’s Law.....	309
Chapter 16: Integers	311
Cumulative Review	311
Team Project.....	312
Graph Integers.....	312
Opposite Integers.....	313
Absolute Value	314
Compare and Order Integers	317
Team Exercise	317
Using “greater than” and “less than” symbols	318
Mixed Review.....	320
ADDITION OF INTEGERS	321
Why Do We Need to Know How to Use the Rules For Addition of Integers?	329
SUBTRACTING INTEGERS.....	331
REAL WORLD APPLICATIONS - WORD PROBLEMS.....	333
Subtraction of Integers.....	333
MULTIPLYING INTEGERS	334
Summary of the Signs of the Rules for Multiplying Integers	336
Cumulative Review	337
DIVIDING INTEGERS.....	337
Working Backward to Solve Division Problems	338
Summary of the Signs of the Rules for Dividing Integers	339
Cumulative Review Exercises	341
Chapter 17: Fractions	341
Group Exercise.....	342
UNDERSTANDING FRACTIONS WITH MORE DIAGRAMS.....	342
Critical Thinking	345
Group Exercise.....	347
FRACTIONS AS A PART OF A SET	350
Quick Cumulative Review	350
What is a Set?.....	351
Group Exercise.....	352
How to Find a Fraction as a Part of a Set	352

ADDITION OF FRACTIONS	361
ADDITION OF FRACTIONS THAT HAVE THE SAME DENOMINATORS	361
REAL WORLD APPLICATIONS - WORD PROBLEMS	363
Addition of Fractions	363
Critical Thinking	364
TYPES OF FRACTIONS	365
RAISING FRACTIONS AND LOWERING FRACTIONS	366
Group Class Exercise	366
How are Equivalent Fractions Obtained?.....	367
Critical Thinking	367
Critical Thinking	370
REAL WORLD APPLICATIONS - WORD PROBLEMS	370
Equivalent Fractions.....	370
MULTIPLES, LEAST COMMON MULTIPLE, COMMON DENOMINATORS, AND LEAST COMMON DENOMINATOR	372
Multiples.....	372
Least Common Multiple.....	372
Common Denominators	375
Least Common Denominator	375
ADDITION OF FRACTIONS THAT HAVE UNLIKE DENOMINATORS	378
REAL WORLD APPLICATIONS - WORD PROBLEMS	384
Addition of Fractions That Have Unlike Denominators	384
ADDITION OF MIXED FRACTIONS	387
REAL WORLD APPLICATIONS - WORD PROBLEMS	393
Addition of Mixed Fractions.....	393
SUBTRACTION OF NUMBERS	396
REAL WORLD APPLICATIONS - WORD PROBLEMS	402
Subtraction of Fractions.....	402
SUBTRACTION OF MIXED FRACTIONS	407
Special Note to the Student	412
REAL WORLD APPLICATIONS - WORD PROBLEMS	418
Subtraction of Mixed Numbers	418
SUBTRACTION OF A FRACTION FROM A WHOLE NUMBER	422
MULTIPLYING FRACTIONS	425
Special Explanation	426
Recommendation	427
REAL WORLD APPLICATIONS - WORD PROBLEMS	431
Multiplying Fractions	431
MULTIPLICATION OF FRACTIONS AND WHOLE NUMBERS	438
REAL WORLD APPLICATIONS - WORD PROBLEMS	445
Multiplication of Fractions and Whole Numbers	445
Critical Thinking	447
REAL WORLD APPLICATIONS - WORD PROBLEMS	455

Finding a Number When a Fractional Part of it is Known.....	455
MORE REAL WORLD APPLICATIONS - WORD PROBLEMS.....	460
Finding a Number When a Fractional Part of it is Known.....	460
FRACTIONAL PARTS.....	462
CUMULATIVE REVIEW - FRACTIONS.....	464
MULTIPLICATION OF FRACTIONS, WHOLE NUMBERS, AND MIXED NUMBERS.....	466
Recommendation.....	476
Cumulative Review.....	480
REAL WORLD APPLICATIONS - WORD PROBLEMS.....	480
Multiplication of Fractions, Whole Numbers, and Mixed Numbers.....	480
DIVISION OF FRACTIONS.....	486
Quick Review.....	486
Relation Among Dividend, Divisor, and Quotient.....	489
REAL WORLD APPLICATIONS - WORD PROBLEMS.....	492
Division of Fractions.....	492
Critical Thinking.....	495
DIVISION OF MIXED NUMBERS.....	497
Critical Link.....	502
REAL WORLD APPLICATIONS - WORD PROBLEMS.....	504
Division by Mixed Numbers.....	504
DIVISION OF A WHOLE NUMBER BY A MIXED NUMBER AND DIVISION OF A MIXED NUMBER BY A WHOLE NUMBER.....	508
REAL WORLD APPLICATIONS - WORD PROBLEMS.....	513
Division of a Whole Number by a mixed Number and Division of a Mixed Number by a Whole Number.....	513
COMPARISON OF FRACTIONS.....	515
Critical Thinking.....	515
Chapter 18: Metric And Customary Systems of Units.....	519
Understanding Measures.....	519
METRIC SYSTEM.....	519
Metric Length.....	519
Benchmark.....	520
Team Exercise.....	520
Team Exercise.....	521
Group Exercise.....	522
Metric Units of Length.....	522
Table of Metric Units.....	523
Converting Between the Metric Units.....	523
Summary.....	526
REAL WORLD APPLICATIONS - WORD PROBLEMS.....	527
Metric Units of Length.....	527

Add and Subtract Measurements.....	529
CUSTOMARY UNITS OF LENGTH	533
CUSTOMARY UNITS OF SQUARE MEASURES	536
REAL WORLD APPLICATIONS - WORD PROBLEMS.....	539
Customary Units of Square Measures	539
METRIC MASS AND CUSTOMARY WEIGHT	540
Metric Mass.....	540
Team Work.....	540
Metric Prefixes.....	540
Metric Mass Units.....	540
CUSTOMARY UNITS OF WEIGHT.....	544
REAL WORLD APPLICATIONS - WORD PROBLEMS.....	545
Customary Units of Weight.....	545
METRIC CAPACITY AND CUSTOMARY CAPACITY	547
METRIC CAPACITY	547
Team Project.....	547
REAL WORLD APPLICATIONS - WORD PROBLEMS.....	550
Metric Capacity.....	550
CUSTOMARY CAPACITY.....	553
Group Exercise.....	553
REAL WORLD APPLICATIONS - WORD PROBLEMS.....	555
Customary Capacity	555
Cumulative Review	556
Chapter 19: Time	557
Review of How to Tell the Time	557
Chapter 20: Probability.....	562
Cumulative Review	562
Class Exercise.....	562
Group Exercise.....	562
Experimental Probability.....	564
Group Exercise.....	569
THEORETICAL PROBABILITY	571
0 AND 1 PROBABILITY VALUES	573
Group Exercise.....	574
Extreme Values of Probability	574
Comparing the Values of Probability.....	574
Group Exercise.....	575

Chapter 21: Relative Frequency	590
Special Note.....	593
CUMULATIVE AND RELATIVE CUMULATIVE FREQUENCY	596
How to find cumulative frequencies	596
Chapter 22: Graphs	600
Cumulative Review	600
Interpreting Data	600
Bar Graph.....	603
Multiple Bar Graph	605
Histogram.....	606
Line Graphs	608
Circle Graph.....	611
MISLEADING GRAPHS AND STATISTICS	618
Cumulative Review	618
Identifying Misleading Graphs.....	618
Statistics	620
Chapter 23: Coordinate System	622
INTRODUCTION	622
Special Notes.....	624
Critical Thinking	626
Graphing on the Coordinate Plane.....	626
Importance of the Sign of the Coordinates	627
Quadrants	630
Critical Thinking	631
Team Exercise	631
Cumulative Review	631
REAL WORLD APPLICATIONS - WORD PROBLEMS	632
Coordinate System	632
Graphing of Equations	633
How can We Graph An Equation?	633
Mixed Review.....	636
SLOPE OF A LINE	637
Types of Slopes.....	637
How to Find the Slope When Two Points are Given.....	641
How to Find the Slope From a Graph.....	642
How to Identify Parallel Lines by Using Other Slopes	644
How to Identify Perpendicular Lines by Using Their Slopes.....	646
How to Graph a Line Using a Point and a Slope.....	654
SLOPE - INTERCEPT FORM	656

How to Find the x-intercept and the y-intercept	656
How to Graph Linear Equations by Finding the x-intercept and the y-intercept.....	656
Slope-Intercept Form	657
How to Use the Slope-intercept Form to Construct the Graph of an Equation	661
How to Write the Equation of the Line That Passes Through Two Given Points in a Slope-intercept Form	666
POINT - SLOPE FORM	667
How to Use the Point-slope Form of the Equation of a Line to Identify the Slope of the Line and the Point the Line Passes Through	668
How to Write the Point-slope Form of an Equation of a Line That Passes Through a Given Point With a Given Slope.....	669
PARALLEL AND PERPENDICULAR LINES	671
How to Write the Point-slope Form of the Equation of a Line that is Parallel to a Given Line and Passes Through a Given Point	671
How to Write the Point-slope Form of the Equation of the Line Which is Perpendicular to a Given Line and Passes Through a Given Point.....	672
Chapter 24: Scatter Plots	673
Group Exercises.....	674
Line of Best Fit	675
Estimating the Line of Best Fit	675
Strong and Weak Correlations	675
Using a Scatter Plot to Make Predictions	675
LINE OF BEST FIT	677
Use of the Line of Best Fit.....	678
How to Estimate the Equation of a Line of Best Fit.....	678
To Find the Line of Best Fit.....	679
Cumulative Review	682
Chapter 25: Congruent Triangles	682
Cumulative Review	682
Congruent Triangles	683
How to Determine the Corresponding Sides and the Corresponding Angles Between Two Triangles	684
Congruence Postulate	684
Critical Conclusion From the Congruence Postulate	685
Chapter 26: Similar Triangles	691
What are Similar Triangles?.....	692
What are Congruent Triangles?.....	692
Are All Similar Triangles Also Congruent Triangles?	692

SIMILAR AND CONGRUENT FIGURES	692
Critical Conclusions	693
Writing Similar Figures and Congruent Figures Using Symbols.....	694
Group Discussion	694
Group Exercise.....	695
How to Use Proportion to Solve Similar Figure Problems	698
REAL WORLD APPLICATIONS - WORD PROBLEMS.....	704
How to Use Proportion to Solve Similar Figure Problems	704
Chapter 27: Angles Formed By A Transversal	706
Group Exercise.....	707
Critical Conclusion	707
How to Find the Measure of Angles Formed by a Transversal that Intersects Two or More Parallel Lines	708
Corresponding, Alternate Interior, and Alternate Exterior Angles	711
The Conditions for Two Lines to be Parallel	712
Group Exercise.....	713
Chapter 28: Scale Drawings.....	716
Team Project 1.....	716
Team Project 2.....	717
Chapter 29: Measurement of Angles.....	720
Quick Review	721
Special Note.....	723
Chapter 29: Construction of Angles	731
Index	754
Application of Technology - Reference.....	763