

AFTERSCHOOL ACHIEVERS:

MATH CLUB  
GRADES 5-8

correlated to

**Illinois**

**Learning Standards  
for Mathematics**

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**correlated to**  
**Illinois Learning Standards for Mathematics**  
**Late Elementary**

**STATE GOAL 6**

**Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios, and proportions.**

**A. Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings.**

Late Elementary Benchmarks	Afterschool Achievers: Math Club Grade 5
6.A.2 Compare and order whole numbers, fractions, and decimals using concrete materials, drawings and mathematical symbols.	<b>Instructor's Guide:</b> 3, 20, 31, 91, 157

**B. Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication, division) and their properties, algorithms and relationships.**

Late Elementary Benchmarks	Afterschool Achievers: Math Club Grade 5
6.B.2 Solve one- and two-step problems involving whole numbers, fractions and decimals using addition, subtraction, multiplication and division.	<b>Instructor's Guide:</b> 2, 3, 4, 6, 7, 8, 9, 13, 14, 15, 17, 18, 19, 21, 24, 26, 27, 29, 32, 33, 34, 36, 37, 38, 39, 40, 41, 42, 47, 48, 50, 53, 54, 57, 59, 63, 64, 69, 73, 74, 75, 78, 79, 82, 83, 89, 93, 100, 104, 107, 112, 114, 117, 119, 122, 124, 125, 129, 133, 139, 144, 155, 160, 164, 169, 174

**C. Compute and estimate using mental mathematics, paper and pencil methods, calculators and computers.**

Late Elementary Benchmarks	Afterschool Achievers: Math Club Grade 5
6.C.2a Select and perform computational procedures to solve problems with whole numbers, fractions, and decimals.	<b>Instructor's Guide:</b> 2, 3, 4, 6, 7, 8, 9, 13, 14, 15, 17, 18, 19, 21, 24, 26, 27, 29, 32, 33, 34, 36, 37, 38, 39, 40, 41, 42, 47, 48, 50, 53, 54, 57, 59, 63, 64, 69, 73, 74, 75, 78, 79, 82, 83, 89, 93, 100, 104, 107, 112, 114, 117, 119, 122, 124, 125, 129, 133, 139, 144, 155, 160, 164, 169, 174

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
6.C.2b Show evidence that computational results using whole numbers, fractions and decimals are correct and/or that estimates are reasonable.	<b>Instructor's Guide:</b> 13, 25, 32, 33, 53, 68, 74, 78, 79, 80, 93, 100, 105, 112, 118, 125, 130, 135, 147, 148, 160, 163, 170

**D. Solve problems using comparisons of quantities, ratios, proportions and percents.**

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
6.D.2 Describe the relationship between two sets of data using ratios and appropriate notations (e.g., a/b, a to b, a:b).	<b>Instructor's Guide:</b> 28, 58, 61, 86, 96, 101, 106, 111, 171

**STATE GOAL 7**

**Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.**

**A. Measure and compare quantities using appropriate units, instruments and methods.**

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
7.A.2a Calculate, compare and convert length, perimeter, area, weight/mass and volume within the customary and metric systems.	<b>Instructor's Guide:</b> 2, 5, 8, 30, 38, 73, 80, 81, 88, 91, 96, 102, 105, 106, 107, 108, 110, 116, 137, 154, 158, 170
7.A.2b Solve addition, subtraction, multiplication, and division problems with currency.	<b>Instructor's Guide:</b> 66, 71, 84, 94, 109, 112, 113, 134, 148, 154, 179

**B. Estimate measurements and determine acceptable levels of accuracy.**

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
7.B.2a Determine and communicate possible methods for estimating a given measure, selecting proper units in both customary and metric systems.	<b>Instructor's Guide:</b> 2, 5, 8, 30, 73, 80, 81, 88, 107, 108, 110, 137, 158, 170

**C. Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.**

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
7.C.2b Construct or draw figures with given perimeters and areas.	<b>Instructor's Guide:</b> 3, 23, 43, 63, 83, 103, 127, 141, 175

**STATE GOAL 8**

Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems, and predict results.

**A. Describe numerical relationships using variables and patterns.**

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
8.A.2a Identify, describe, extend and create geometric and numeric patterns.	<b>Instructor's Guide:</b> 1, 6, 11, 16, 18, 21, 45, 46, 48, 56, 65, 76, 114, 126, 131, 136, 141, 147, 149, 165
8.A.2b Construct and solve number sentences using a variable to represent an unknown quantity.	<b>Instructor's Guide:</b> 17, 51, 56, 76

**B. Interpret and describe numerical relationships using tables, graphs and symbols.**

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
8.B.2 Analyze a geometric pattern and express the results numerically.	<b>Instructor's Guide:</b> 141

**C. Solve problems using systems of numbers and their properties.**

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
8.C.2 Explain operations and number properties, including commutative, associative, distributive, transitive, zero, equality and order of operations.	<b>Instructor's Guide:</b> 26, 83, 90, 92, 142, 162

**D. Use algebraic concepts and procedures to represent and solve problems.**

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
8.D.2 Solve linear equations involving whole numbers.	<b>Instructor's Guide:</b> 17, 51, 56, 76

**STATE GOAL 9**

Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes, and space.

**A. Demonstrate and apply geometric concepts involving points, lines, planes and space.**

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
9.A.2a Build physical models of two- and three-dimensional shapes.	<b>Instructor's Guide:</b> 3, 10, 22, 23, 35, 43, 60, 63, 83, 102, 103, 110, 115, 127, 128, 138, 140, 146, 153
9.A.2c Describe and draw representations of geometric relationships, patterns, symmetries, and designs in two-and three-dimensions with and without technology.	<b>Instructor's Guide:</b> 3, 10, 22, 23, 35, 43, 60, 63, 83, 102, 103, 110, 115, 127, 128, 138, 140, 146, 153

**B. Identify, describe, classify and compare relationships using points, lines, planes and solids.**

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
9.B.2 Compare geometric figures and determine their properties including parallel, perpendicular, similar, congruent and line symmetry.	<b>Instructor's Guide:</b> 102, 110, 115, 128, 138, 140, 153, 175

**C. Construct convincing arguments and proofs to solve problems.**

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
9.C.2 Formulate logical arguments about geometric figures and patterns and communicate reasoning.	<b>Instructor's Guide:</b> 3, 10, 22, 23, 35, 43, 60, 63, 83, 102, 103, 110, 115, 127, 138, 140, 146, 153

## **STATE GOAL 10**

**Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.**

### **A. Organize, describe and make predictions from existing data.**

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
10.A.2a Organize and display data using pictures, tallies, tables, charts, bar graphs, line graphs, line plots and stem-and-leaf graphs.	<b>Instructor's Guide:</b> 151, 156, 161, 166, 176
10.A.2c Make predictions and decisions based on data and communicate their reasoning.	<b>Instructor's Guide:</b> 151, 156, 161, 166, 176

### **B. Formulate questions, design data collection methods, gather and analyze data and communicate findings.**

<b>Late Elementary Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 5</b>
10.B.2a Formulate questions of interest and select methods to systematically collect data.	<b>Instructor's Guide:</b> 151, 156, 161, 166, 176
10.B.2b Collect, organize and display data using tables, charts, bar graphs, line graphs, circle graphs, line plots and stem-and-leaf graphs.	<b>Instructor's Guide:</b> 151, 156, 161, 166, 176
10.B.2d Interpret results or make relevant decisions based on the data gathered.	<b>Instructor's Guide:</b> 151, 156, 161, 166, 176



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**Illinois Learning Standards for Mathematics**  
**Middle/Junior High School**

**STATE GOAL 6**

**Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios, and proportions.**

**A. Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 6
6.A.3 Represent fractions, decimals, percentages, exponents and scientific notation in equivalent forms.	<b>Instructor's Guide:</b> 1, 9, 26, 30, 44, 51, 59, 61, 62, 76, 104, 105, 106, 116, 151, 156, 157, 158

**B. Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication, division) and their properties, algorithms and relationships.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 6
6.B.3a Solve practical computation problems involving whole numbers, integers and rational numbers.	<b>Instructor's Guide:</b> 2, 7, 10, 20, 22, 29, 32, 33, 37, 38, 40, 46, 47, 48, 54, 57, 58, 60, 65, 69, 80, 81, 88, 89, 91, 92, 93, 102, 103, 109, 116, 121, 124, 125, 129, 131, 139, 160, 164, 165, 172, 173, 174
6.B.3b Apply primes, divisors, multiples, common factors and common multiples in solving problems.	<b>Instructor's Guide:</b> 1, 14, 35, 36, 39, 47, 48, 49, 51, 62, 63, 66, 73, 74, 77, 78, 82, 83, 107, 117, 118, 137, 138, 152, 153
6.B.3c Identify and apply properties of real numbers, including pi, squares, and square roots.	<b>Instructor's Guide:</b> 55, 75, 95, 157, 158, 161

**C. Compute and estimate using mental mathematics, paper and pencil methods, calculators and computers.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 6</b>
6.C.3a Select computational procedures and solve problems with whole numbers, fractions, decimals, percents and proportions.	<b>Instructor's Guide:</b> 7, 10, 20, 22, 29, 31, 32, 33, 37, 38, 40, 46, 48, 54, 57, 58, 60, 65, 69, 88, 89, 91, 92, 93, 100, 102, 103, 104, 105, 106, 110, 116, 120, 121, 125, 129, 131, 134, 136, 160, 172, 173, 174
6.C.3b Show evidence that computational results using whole numbers, fractions, decimals, percents and proportions are correct and/or that estimates are reasonable.	<b>Instructor's Guide:</b> 7, 22, 25, 32, 33, 37, 57, 60, 65, 89, 93, 104, 105, 110, 120, 121, 134, 145, 172, 173, 174

**D. Solve problems using comparisons of quantities, ratios, proportions and percents.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 6</b>
6.D.3 Apply ratios and proportions to solve practical problems.	<b>Instructor's Guide:</b> 100, 110

**STATE GOAL 7**

**Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.**

**A. Measure and compare quantities using appropriate units, instruments and methods.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 6</b>
7.A.3a Measure length, capacity, weight/mass, and angles using sophisticated instruments (e.g., compass, protractor, trundle wheel).	<b>Instructor's Guide:</b> 142, 147
7.A.3b Apply the concepts and attributes of length, capacity, weight/mass, perimeter, area, volume, time, temperature and angle measures in practical situations.	<b>Instructor's Guide:</b> 19, 24, 31, 85, 86, 97, 98, 107, 108, 115, 126, 142, 144, 147, 148, 155, 174, 180

**B. Estimate measurements and determine acceptable levels of accuracy.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 6
7.B.3 Select and apply instruments including rulers and protractors and units of measure to the degree of accuracy required.	<b>Instructor's Guide:</b> 142, 147

**C. Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 6
7.C.3a Construct a simple scale drawing for a given situation.	<b>Instructor's Guide:</b> 180
7.C.3b Use concrete and graphic models and appropriate formulas to find perimeters, areas, surface areas and volumes of two- and three-dimensional regions.	<b>Instructor's Guide:</b> 85, 87, 88, 90, 97, 98, 107, 108, 115, 126, 142, 143, 144, 147, 155, 176, 180

**STATE GOAL 8**

Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems, and predict results.

**A. Describe numerical relationships using variables and patterns.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 6
8.A.3a Apply the basic properties of commutative, associative, distributive, transitive, inverse, identity, zero, equality and order of operations to solve problems.	<b>Instructor's Guide:</b> 38, 50, 55, 57, 58, 75, 95, 141, 161, 166, 169
8.A.3b Solve problems using linear expressions, equations and inequalities.	<b>Instructor's Guide:</b> 13, 16, 18, 28, 37, 38, 41, 55, 56, 64, 67, 69, 75, 87, 88, 95, 109, 146, 150, 171

**B. Interpret and describe numerical relationships using tables, graphs and symbols.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 6
8.B.3 Use graphing technology and algebraic methods to analyze and predict linear relationships and make generalizations from linear patterns.	<b>Instructor's Guide:</b> 18, 28, 68, 114

**C. Solve problems using systems of numbers and their properties.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 6</b>
8.C.3 Apply the properties of numbers and operations including inverses in algebraic settings derived from economics, business and the sciences.	<b>Instructor's Guide:</b> 99, 111, 120, 125, 131

**D. Use algebraic concepts and procedures to represent and solve problems.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 6</b>
8.D.3a Solve problems using numeric, graphic or symbolic representations of variables, expressions, equations and inequalities.	<b>Instructor's Guide:</b> 13, 16, 18, 28, 37, 38, 41, 55, 56, 64, 67, 69, 75, 87, 88, 95, 98, 109, 146, 150, 171
8.D.3b Propose and solve problems using proportions, formulas and linear functions.	<b>Instructor's Guide:</b> 13, 18, 28, 37, 85, 98, 100, 110, 115
8.D.3c Apply properties of powers, perfect squares and square roots.	<b>Instructor's Guide:</b> 1, 51, 96, 141, 157, 158, 161

**STATE GOAL 9**

Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes, and space.

**A. Demonstrate and apply geometric concepts involving points, lines, planes and space.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 6</b>
9.A.3a Draw or construct two- and three-dimensional geometric figures including prisms, pyramids, cylinders and cones.	<b>Instructor's Guide:</b> 79, 84, 90, 94, 101
9.A.3b Draw transformation images of figures, with and without the use of technology.	<b>Instructor's Guide:</b> 52, 53, 58
9.A.3c Use concepts of symmetry, congruency, similarity, scale, perspective, and angles to describe and analyze two- and three-dimensional shapes found in practical applications (e.g., geodesic domes, A-Frame houses, basketball courts, inclined planes, art forms, blueprints).	<b>Instructor's Guide:</b> 72, 94, 167, 180

**B. Identify, describe, classify and compare relationships using points, lines, planes and solids.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 6</b>
9.B.3 Identify, describe, classify and compare two- and three-dimensional geometric figures and models according to their properties.	<b>Instructor's Guide:</b> 12, 27, 28, 72, 79, 84, 90, 94, 101, 170, 180

**C. Construct convincing arguments and proofs to solve problems.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 6</b>
9.C.3a Construct, develop and communicate logical arguments (informal proofs) about geometric figures and patterns.	<b>Instructor's Guide:</b> 4, 12, 87, 88, 92, 93, 149, 152, 153, 171
9.C.3b Develop and solve problems using geometric relationships and models, with and without the use of technology.	<b>Instructor's Guide:</b> 4, 19, 28, 87, 152, 153, 162, 163, 167, 168

**D. Use trigonometric ratios and circular functions to solve problems.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 6</b>
9.D.3 Compute distances, lengths and measures of angles using proportions, the Pythagorean theorem and its converse.	<b>Instructor's Guide:</b> 110

**STATE GOAL 10**

Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

**A. Organize, describe and make predictions from existing data.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 6</b>
10.A.3a Construct, read, and interpret tables, graphs (including circle graphs) and charts to organize and represent data.	<b>Instructor's Guide:</b> 17, 18, 67, 68, 122, 133, 135, 140, 175
10.A.3b Compare the mean, median, mode and range, with and without the use of technology.	<b>Instructor's Guide:</b> 91, 133, 135, 143

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 6</b>
10.A.3c Test the reasonableness of an argument based on data and communicate their findings.	<b>Instructor's Guide:</b> 135, 140, 143

**B. Formulate questions, design data collection methods, gather and analyze data and communicate findings.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 6</b>
10.B.3 Formulate questions (e.g., relationships between car age and mileage, average incomes and years of schooling), devise and conduct experiments or simulations, gather data, draw conclusions and communicate results to an audience using traditional methods and contemporary technologies.	<b>Instructor's Guide:</b> 122, 123, 127, 128, 132, 133, 135, 140

**C. Determine, describe and apply the probabilities of events.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 6</b>
10.C.3a Determine the probability and odds of events using fundamental counting principals.	<b>Instructor's Guide:</b> 123, 127, 128, 132, 133
10.C.3b Analyze problem situations (e.g., board games, grading scales) and make predictions about results.	<b>Instructor's Guide:</b> 127, 128, 133



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**Middle/Junior High School**

**STATE GOAL 6**

**Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios, and proportions.**

**A. Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 7
6.A.3 Represent fractions, decimals, percentages, exponents and scientific notation in equivalent forms.	<b>Instructor's Guide:</b> 1, 10, 14, 26, 27, 33, 44, 54, 76, 92, 93, 106, 127, 128, 136, 175

**B. Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication, division) and their properties, algorithms and relationships.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 7
6.B.3a Solve practical computation problems involving whole numbers, integers and rational numbers.	<b>Instructor's Guide:</b> 16, 25, 30, 31, 34, 35, 40, 44, 46, 55, 65, 67, 80, 81, 95, 96, 109, 111, 116, 119, 121, 139, 141, 161
6.B.3b Apply primes, divisors, multiples, common factors and common multiples in solving problems.	<b>Instructor's Guide:</b> 1, 9, 14, 36, 47, 48, 57, 66, 70, 74, 154
6.B.3c Identify and apply properties of real numbers, including pi, squares, and square roots.	<b>Instructor's Guide:</b> 39, 49, 52, 53, 71, 97, 98, 112, 113, 118

**C. Compute and estimate using mental mathematics, paper and pencil methods, calculators and computers.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 7
6.C.3a Select computational procedures and solve problems with whole numbers, fractions, decimals, percents and proportions.	<b>Instructor's Guide:</b> 10, 16, 20, 25, 27, 35, 40, 44, 46, 55, 78, 92, 93, 95, 96, 104, 116, 121, 129, 150, 160, 170

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
6.C.3b Show evidence that computational results using whole numbers, fractions, decimals, percents and proportions are correct and/or that estimates are reasonable.	<b>Instructor's Guide:</b> 10, 16, 20, 25, 35, 70, 78, 80, 92, 93, 104, 129, 150, 160, 170

**D. Solve problems using comparisons of quantities, ratios, proportions and percents.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
6.D.3 Apply ratios and proportions to solve practical problems.	<b>Instructor's Guide:</b> 10, 77, 78, 104, 157, 162, 170, 177

**STATE GOAL 7**

Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

**A. Measure and compare quantities using appropriate units, instruments and methods.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
7.A.3a Measure length, capacity, weight/mass, and angles using sophisticated instruments (e.g., compass, protractor, trundle wheel).	<b>Instructor's Guide:</b> 11, 152, 153, 162, 163
7.A.3b Apply the concepts and attributes of length, capacity, weight/mass, perimeter, area, volume, time, temperature and angle measures in practical situations.	<b>Instructor's Guide:</b> 4, 11, 19, 45, 50, 74, 82, 86, 92, 93, 126, 134, 145, 162, 163, 171, 176, 180

**B. Estimate measurements and determine acceptable levels of accuracy.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
7.B.3 Select and apply instruments including rulers and protractors and units of measure to the degree of accuracy required.	<b>Instructor's Guide:</b> 11, 152, 153, 162, 163

**C. Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
7.C.3b Use concrete and graphic models and appropriate formulas to find perimeters, areas, surface areas and volumes of two- and three-dimensional regions.	<b>Instructor's Guide:</b> 4, 12, 19, 24, 45, 50, 74, 87, 92, 93, 126, 130, 145, 171, 176, 180

**STATE GOAL 8**

Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems, and predict results.

**A. Describe numerical relationships using variables and patterns.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
8.A.3a Apply the basic properties of commutative, associative, distributive, transitive, inverse, identity, zero, equality and order of operations to solve problems.	<b>Instructor's Guide:</b> 16, 44, 56, 64, 69, 71, 110, 124, 141, 144, 149, 161
8.A.3b Solve problems using linear expressions, equations and inequalities.	<b>Instructor's Guide:</b> 5, 13, 16, 29, 56, 60, 63, 68, 73, 74, 83, 110, 146

**B. Interpret and describe numerical relationships using tables, graphs and symbols.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
8.B.3 Use graphing technology and algebraic methods to analyze and predict linear relationships and make generalizations from linear patterns.	<b>Instructor's Guide:</b> 29, 67, 68, 72, 73, 82, 88, 155

**C. Solve problems using systems of numbers and their properties.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
8.C.3 Apply the properties of numbers and operations including inverses in algebraic settings derived from economics, business and the sciences.	<b>Instructor's Guide:</b> 44, 99, 100, 120, 131, 144, 151, 159

**D. Use algebraic concepts and procedures to represent and solve problems.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
8.D.3a Solve problems using numeric, graphic or symbolic representations of variables, expressions, equations and inequalities.	<b>Instructor's Guide:</b> 5, 13, 16, 18, 29, 41, 56, 60, 61, 63, 64, 67, 68, 72, 73, 74, 83, 110, 146, 155
8.D.3b Propose and solve problems using proportions, formulas and linear functions.	<b>Instructor's Guide:</b> 4, 10, 45, 50, 68, 73, 74, 78, 92, 93, 104, 112, 113, 115, 117, 126, 145, 148, 163, 170, 171, 172, 173, 176, 180
8.D.3c Apply properties of powers, perfect squares and square roots.	<b>Instructor's Guide:</b> 14, 32, 39, 49, 52, 53, 60, 66, 97, 98, 112, 113, 118

**STATE GOAL 9**

Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes, and space.

**A. Demonstrate and apply geometric concepts involving points, lines, planes and space.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
9.A.3a Draw or construct two- and three-dimensional geometric figures including prisms, pyramids, cylinders and cones.	<b>Instructor's Guide:</b> 17, 42, 43, 79, 84, 101
9.A.3b Draw transformation images of figures, with and without the use of technology.	<b>Instructor's Guide:</b> 7, 15, 42, 43, 112, 113, 117, 118, 164
9.A.3c Use concepts of symmetry, congruency, similarity, scale, perspective, and angles to describe and analyze two- and three-dimensional shapes found in practical applications (e.g., geodesic domes, A-Frame houses, basketball courts, inclined planes, art forms, blueprints).	<b>Instructor's Guide:</b> 94, 101

**B. Identify, describe, classify and compare relationships using points, lines, planes and solids.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
9.B.3 Identify, describe, classify and compare two- and three-dimensional geometric figures and models according to their properties.	<b>Instructor's Guide:</b> 17, 21, 37, 38, 79, 89, 101, 152, 153, 157, 158, 169

**C. Construct convincing arguments and proofs to solve problems.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
9.C.3a Construct, develop and communicate logical arguments (informal proofs) about geometric figures and patterns.	<b>Instructor's Guide:</b> 17, 19, 24, 89, 112, 113, 117, 118, 132, 152, 153, 157, 158, 169
9.C.3b Develop and solve problems using geometric relationships and models, with and without the use of technology.	<b>Instructor's Guide:</b> 24, 152, 153

**D. Use trigonometric ratios and circular functions to solve problems.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
9.D.3 Compute distances, lengths and measures of angles using proportions, the Pythagorean theorem and its converse.	<b>Instructor's Guide:</b> 78, 112, 113, 115, 117, 157, 170, 180

**STATE GOAL 10**

**Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.**

**A. Organize, describe and make predictions from existing data.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
10.A.3a Construct, read, and interpret tables, graphs (including circle graphs) and charts to organize and represent data.	<b>Instructor's Guide:</b> 2, 17, 82, 90, 102, 103, 122, 125, 135, 140, 165
10.A.3b Compare the mean, median, mode and range, with and without the use of technology.	<b>Instructor's Guide:</b> 75, 83, 91, 108, 123
10.A.3c Test the reasonableness of an argument based on data and communicate their findings.	<b>Instructor's Guide:</b> 103, 125, 137

**B. Formulate questions, design data collection methods, gather and analyze data and communicate findings.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
10.B.3 Formulate questions (e.g., relationships between car age and mileage, average incomes and years of schooling), devise and conduct experiments or simulations, gather data, draw conclusions and communicate results to an audience using traditional methods and contemporary technologies.	<b>Instructor's Guide:</b> 2, 17, 82, 90, 102, 103, 122, 123, 125, 135, 140, 165

**C. Determine, describe and apply the probabilities of events.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 7</b>
10.C.3a Determine the probability and odds of events using fundamental counting principals.	<b>Instructor's Guide:</b> 85, 92, 93, 122, 123, 125, 137, 138, 142, 143
10.C.3b Analyze problem situations (e.g., board games, grading scales) and make predictions about results.	<b>Instructor's Guide:</b> 22, 92, 93, 122, 123, 125, 137, 138, 142, 143



**Afterschool Achievers: Math Club Grade 8 © 2003**  
**correlated to**  
**Illinois Learning Standards for Mathematics**  
**Middle/Junior High School**

**STATE GOAL 6**

**Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios, and proportions.**

**A. Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 8
6.A.3 Represent fractions, decimals, percentages, exponents and scientific notation in equivalent forms.	<b>Instructor's Guide:</b> 26, 54, 59, 61, 66, 96

**B. Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication, division) and their properties, algorithms and relationships.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 8
6.B.3a Solve practical computation problems involving whole numbers, integers and rational numbers.	<b>Instructor's Guide:</b> 6, 25, 30, 31, 34, 35, 37, 39, 40, 45, 46, 56, 65, 66, 81, 95, 96, 100, 109, 111, 116, 117, 118, 121, 129, 140, 160, 165
6.B.3b Apply primes, divisors, multiples, common factors and common multiples in solving problems.	<b>Instructor's Guide:</b> 1, 7, 8, 14, 36
6.B.3c Identify and apply properties of real numbers, including pi, squares, and square roots.	<b>Instructor's Guide:</b> 1, 13, 14, 25, 49, 50, 56, 71, 86, 90, 92, 93, 117, 118, 136, 149, 152

**C. Compute and estimate using mental mathematics, paper and pencil methods, calculators and computers.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 8
6.C.3a Select computational procedures and solve problems with whole numbers, fractions, decimals, percents and proportions.	<b>Instructor's Guide:</b> 1, 3, 10, 35, 44, 45, 46, 47, 54, 61, 95, 96, 100, 104, 106, 109, 118, 121, 129, 147

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
6.C.3b Show evidence that computational results using whole numbers, fractions, decimals, percents and proportions are correct and/or that estimates are reasonable.	<b>Instructor's Guide:</b> 1, 10, 35, 40, 115

**D. Solve problems using comparisons of quantities, ratios, proportions and percents.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
6.D.3 Apply ratios and proportions to solve practical problems.	<b>Instructor's Guide:</b> 3, 10, 44, 45, 46, 47, 54, 61, 104, 109, 118, 147

**STATE GOAL 7**

Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

**A. Measure and compare quantities using appropriate units, instruments and methods.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
7.A.3a Measure length, capacity, weight/mass, and angles using sophisticated instruments (e.g., compass, protractor, trundle wheel).	<b>Instructor's Guide:</b> 11, 82, 168, 172, 173
7.A.3b Apply the concepts and attributes of length, capacity, weight/mass, perimeter, area, volume, time, temperature and angle measures in practical situations.	<b>Instructor's Guide:</b> 2, 4, 11, 17, 19, 24, 47, 48, 52, 53, 55, 74, 76, 80, 82, 91, 92, 93, 112, 113, 126, 130, 144, 145, 155, 159, 171, 176, 180

**B. Estimate measurements and determine acceptable levels of accuracy.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
7.B.3 Select and apply instruments including rulers and protractors and units of measure to the degree of accuracy required.	<b>Instructor's Guide:</b> 11, 82, 168, 172, 173

**C. Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
7.C.3a Construct a simple scale drawing for a given situation.	<b>Instructor's Guide:</b> 17
7.C.3b Use concrete and graphic models and appropriate formulas to find perimeters, areas, surface areas and volumes of two- and three-dimensional regions.	<b>Instructor's Guide:</b> 4, 19, 24, 47, 48, 52, 53, 74, 76, 92, 93, 112, 113, 126, 130, 145, 144, 145, 155, 171, 176, 180

**STATE GOAL 8**

Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems, and predict results.

**A. Describe numerical relationships using variables and patterns.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
8.A.3a Apply the basic properties of commutative, associative, distributive, transitive, inverse, identity, zero, equality and order of operations to solve problems.	<b>Instructor's Guide:</b> 19, 25, 41, 56, 69, 71, 95, 115, 117, 118, 124, 141, 149, 161
8.A.3b Solve problems using linear expressions, equations and inequalities.	<b>Instructor's Guide:</b> 5, 16, 18, 23, 41, 43, 64, 86, 90, 120, 144, 154, 164

**B. Interpret and describe numerical relationships using tables, graphs and symbols.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
8.B.3 Use graphing technology and algebraic methods to analyze and predict linear relationships and make generalizations from linear patterns.	<b>Instructor's Guide:</b> 7, 8, 13, 22, 29, 97, 98, 164

**C. Solve problems using systems of numbers and their properties.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
8.C.3 Apply the properties of numbers and operations including inverses in algebraic settings derived from economics, business and the sciences.	<b>Instructor's Guide:</b> 99, 106, 110, 119, 151, 156, 159

**D. Use algebraic concepts and procedures to represent and solve problems.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
8.D.3a Solve problems using numeric, graphic or symbolic representations of variables, expressions, equations and inequalities.	<b>Instructor's Guide:</b> 5, 16, 17, 18, 23, 29, 41, 43, 64, 86, 90, 120, 121, 133, 144, 154
8.D.3b Propose and solve problems using proportions, formulas and linear functions.	<b>Instructor's Guide:</b> 3, 4, 10, 19, 44, 45, 46, 47, 52, 53, 54, 61, 74, 77, 104, 109, 112, 113, 118, 126, 130, 145, 147, 155, 171, 176, 180
8.D.3c Apply properties of powers, perfect squares and square roots.	<b>Instructor's Guide:</b> 1, 13, 14, 49, 50, 56, 86, 90, 92, 93, 117, 136, 152

**STATE GOAL 9**

Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes, and space.

**A. Demonstrate and apply geometric concepts involving points, lines, planes and space.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
9.A.3a Draw or construct two- and three-dimensional geometric figures including prisms, pyramids, cylinders and cones.	<b>Instructor's Guide:</b> 32, 84, 148, 152
9.A.3b Draw transformation images of figures, with and without the use of technology.	<b>Instructor's Guide:</b> 15, 22, 23, 38, 57, 58, 62, 82, 83, 87, 88, 137, 138, 179
9.A.3c Use concepts of symmetry, congruency, similarity, scale, perspective, and angles to describe and analyze two- and three-dimensional shapes found in practical applications (e.g., geodesic domes, A-Frame houses, basketball courts, inclined planes, art forms, blueprints).	<b>Instructor's Guide:</b> 4, 10, 15, 17, 23, 24, 32, 33, 47, 48, 50, 76, 79, 82, 83, 89, 91, 92, 93, 94, 101, 102, 103, 107, 108, 134, 147, 148, 157, 158, 169, 170, 179

**B. Identify, describe, classify and compare relationships using points, lines, planes and solids.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
9.B.3 Identify, describe, classify and compare two- and three-dimensional geometric figures and models according to their properties.	<b>Instructor's Guide:</b> 4, 15, 23, 24, 32, 33, 50, 79, 82, 89, 91, 92, 93, 94, 101, 102, 103, 107, 108, 134, 147, 148, 169, 170, 179

**C. Construct convincing arguments and proofs to solve problems.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
9.C.3a Construct, develop and communicate logical arguments (informal proofs) about geometric figures and patterns.	<b>Instructor's Guide:</b> 15, 32, 33, 50, 72, 73, 103
9.C.3b Develop and solve problems using geometric relationships and models, with and without the use of technology.	<b>Instructor's Guide:</b> 4, 15, 23, 24, 32, 33, 50, 79, 82, 89, 91, 92, 93, 94, 101, 102, 103, 107, 108, 134, 147, 148, 169, 170, 179

**D. Use trigonometric ratios and circular functions to solve problems.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
9.D.3 Compute distances, lengths and measures of angles using proportions, the Pythagorean theorem and its converse.	<b>Instructor's Guide:</b> 10, 17, 21, 33, 50, 82, 91, 107, 108, 112, 113, 147, 152, 157, 158

**STATE GOAL 10**

Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

**A. Organize, describe and make predictions from existing data.**

<b>Middle/Junior High School Benchmarks</b>	<b>Afterschool Achievers: Math Club Grade 8</b>
10.A.3a Construct, read, and interpret tables, graphs (including circle graphs) and charts to organize and represent data.	<b>Instructor's Guide:</b> 7, 8, 70, 75, 80, 110, 135, 150, 172, 173
10.A.3b Compare the mean, median, mode and range, with and without the use of technology.	<b>Instructor's Guide:</b> 39, 70, 75
10.A.3c Test the reasonableness of an argument based on data and communicate their findings.	<b>Instructor's Guide:</b> 70, 80, 110

**B. Formulate questions, design data collection methods, gather and analyze data and communicate findings.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 8
10.B.3 Formulate questions (e.g., relationships between car age and mileage, average incomes and years of schooling), devise and conduct experiments or simulations, gather data, draw conclusions and communicate results to an audience using traditional methods and contemporary technologies.	<b>Instructor's Guide:</b> 39, 70, 75, 80, 110

**C. Determine, describe and apply the probabilities of events.**

Middle/Junior High School Benchmarks	Afterschool Achievers: Math Club Grade 8
10.C.3a Determine the probability and odds of events using fundamental counting principals.	<b>Instructor's Guide:</b> 27, 28, 125, 128, 142, 143, 175
10.C.3b Analyze problem situations (e.g., board games, grading scales) and make predictions about results.	<b>Instructor's Guide:</b> 27, 142, 143



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