

Tennessee Board of Education Mathematics Curriculum Standards Eighth Grade

**Correlations of the TEN UNDERSTANDING MATHEMATICS PLUS Programs
By Neufeld Learning Systems Inc.
March 2005**

Note: a. The Understanding Math PLUS series of programs consist of 10 programs written for Kindergarten to 10th Grade.

The 10 programs are:

- | | |
|---|---|
| Understanding Fractions | Understanding Whole Numbers and Integers |
| Understanding Probability | Understanding Percent |
| Understanding Exponents | Understanding Equations |
| Understanding Algebra | Understanding Graphing |
| Understanding Numeration | |
| Understanding Measurement and Geometry | |

Note: b. The Understanding Numeration software for K to 3 is set up so that the teacher selects items in the following order:

Concept .. from 5 concepts .. Counting, Comparing & Ordering, Place Value, Operations and Problem Solving.

Skill .. chosen from the list of specific learning expectations

Level .. indicates the levels of development for Kindergarten to 3rd grade.

Level	Upper Range of Number
A	10
B	20
C	100
D	1000

Lesson .. 250 lessons are sequenced to build understanding of concepts.

A detailed Lesson Synopsis on the website www.neufeldmath.com to assist the teacher by stating the lesson contents but also by giving lesson suggestions.

Worksheet .. off computer worksheets are selected from the CD by a code.

Note: c. The remaining 9 Understanding Math programs for 4th to 10th grade are set up so that they can be used in a variety of teaching and learning environments ranging from a teacher centered approach with 1 computer to a student centered lab approach. The lessons can also be used in remediation, tutorial, intervention, resource, fast-tracking.

Each topic has:

- ..an interactive concept introduction, usually with a variety of graphic approaches.
- ..a number of particular examples
- ..practice questions with random questions but particular feedback

Neufeld Learning Systems Inc., March 2005

Source: Mathematics Curriculum Standard, Tennessee State Board of Education, 2001, <http://www.state.tn.us/education/ci/cistandards2001/math/cimath68stand.htm>

..a topic test with random questions and tracking
..off computer worksheets selected from the website .. www.neufeldmath.com

**Curriculum is correlated with Understanding Math programs in the following manner:*
MAT+ (Understanding Math Plus, 4-10) / Program Title / Topic Number & Title / Lesson Title

Number and Operations

Content Standard 1.0

The student will develop number and operation sense needed to represent numbers and number relationships verbally, symbolically, and graphically and to compute fluently and make reasonable estimates in problem solving.

Learning Expectations:

1.1 Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

1.2 Understand operations and how they relate to one another.

1.3 Solve problems, compute fluently, and make reasonable estimates.

MAT+ / Understanding Whole Numbers and Integers / Topic 1 – The Meaning of Whole Numbers CAN/US / Seeing the Number: To Tens – Examples 1& 2, To Hundreds – Examples 1 & 2, To Thousands – Examples 1,2,3; Expanded Notation: To 999 – Examples 1 & 2, To 9999 – Examples 1 & 2, Write as Numerals – Examples 1 & 2, The Number Line; Represent Numbers in Many Ways: Examples 1 through 5; Place Value to 999 999: Examples 1 through 5, The Number Line – Examples 1 & 2; Millions: Examples 1 through 4, The Number Line; Billions: Example 1; Comparing Large Numbers: Examples 1 through 4; Ordering Large Numbers: Examples 1 through 4; Rounding Large Numbers: Examples 1 through 5; Practice Questions; Topic Test

MAT+ / Understanding Whole Numbers and Integers / Topic 2 – Adding and Subtracting Whole Numbers / Add - Partial Sums: Examples 1 through 6; Add – Trade First: Examples 1 through 6; Add – Right to Left: Examples 1 through 6; Subtract – Right to Left: Examples 1 through 6; Subtract – Trade First: Examples 1 through 6; Subtract – Add Up: Examples 1 through 6; Subtract – Add up to Zero: Examples 1 through 4; Whole Numbers Around Us: Examples 1 through 11

MAT+ / Understanding Whole Numbers and Integers / Topic 3 – Multiplying and Dividing Whole Numbers / Multiplication Facts: Groups of 6,7,8,9; Commutative Property: $5 \times 1 = 1 \times 5$, etc.; The 10x10 Multiplication Table: User Picks, Computer Picks; The 12x12 Multiplication Table: Associative Property, Examples 1,2; Multiples of 10, 100, 1000: Patterns in Multiplication by 10, Patterns in Multiplication by 100, Patterns in Multiplication by 1000, Examples 1,2,3; Multiplying by a Single Digit Number: Repeated Addition: Repeated Addition Examples 1 through 4; Partial Products Examples 1 through 6, Questions 1,2,3; Distributive Property; Lattice Method; The Standard Method; Multiply by a Two Digit Multiplier: Partial Products; The Distributive Method; The Lattice Method; The Standard Method; Divide by a Single Digit Divisor: Fair

Sharing Examples 1& 2, Questions 1 through 6; Whole Numbers Around Us: Examples 1 through 11

Eighth Grade Benchmarks Performance Indicators State: As documented through state assessment

– *at Level 1, the student is able to*

⇒ 8.1.spi.1. identify the opposite and the reciprocal of a rational number;

MAT+ / Understanding Fractions / Topic 11 – Dividing Fractions / Understanding Division; Examples of Division; Patterns form Examples; Another Explanation; Examples without Diagrams; Practice Questions

⇒ 8.1.spi.2. compare rational numbers using the appropriate symbol ($<$, $>$, $=$).

MAT+ / Understanding Fractions / Topic 1 – The Meaning of Fractions / Comparison of Fractions: The Symbol – Greater Than, Less Than, Greater and Less Than, Concepts 1 & 2, Examples 1 through 4

- *at Level 2, the student is able to*

⇒ 8.1.spi.3. use ratios and proportions to represent real-world situations (i.e., scale drawings, probability);

MAT+ / Understanding Fractions / Topic 7 – Ratios and Proportions / Ratios in the News; What is a Ratio? Examples 1 through 4; Writing Ratios: Concept, Examples 1 through 4; What is Proportion?: Examples 1 through 4; Ratios and Your Body: Golden Ratio, Measuring Your Body; Practice Questions; Topic Test

⇒ 8.1.spi.4. determine the approximate locations of rational numbers on a number line;

MAT+ / Understanding Fractions / Topic 3 – Equivalent Fractions / Equivalent Fractions on a Number Line; Comparison of Fractions

⇒ 8.1.spi.5. determine the square roots of perfect squares (< 169);

MAT+ / Understanding Exponents / Topic 5 – Square Root / Squaring Numbers; Square Roots

⇒ 8.1.spi.6. work flexibly with fractions, decimals, and percents to solve one- and two-step word problems;

⇒ 8.1.spi.7. compute efficiently and accurately with whole numbers, fractions, decimals, and percents;

MAT+ / Understanding Percent / Topic 2 – Percent to Fraction/ Decimal / Expressing Percent as a Fraction: Introduction without Graphics, Introduction with Graphics, Fraction in Simplest Form – Greatest Common Factor, Simplifying Fractions; Examples 1 through 4; The Watering Can; Expressing Percent as a Decimal: Introduction, Examples 1,2,3; Number Line; Practice Questions; Topic Test

MAT+ / Understanding Percent / Topic 3 – Fraction/Decimal to Percent / Decimals to Fractions – Place Value; Expressing a Fraction as a Percent: Examples 1,2,3, Summary

and Pattern, Percent Nitrogen in Air, Batting Averages; Expressing a Fraction as a Percent: An Example, Methods 1 & 2; Percent Change: Percent Increase, Percent Decrease, Percent Increase or Decrease; Number Line; Chart; My Day; Fraction to Decimal Division Table; Practice Questions; Topic Test

⇒ 8.1.spi.8. use estimation strategies to select a reasonable solution to a real-world problem involving computing with rational numbers;

⇒ 8.1.spi.9. calculate rates involving cost per unit to determine the best buy.

MAT+ / Understanding Percent / Topic 6 – Problems Involving Percent / Steps in Solving Problems; Finding the Whole: Recall Proportion, School Population: Method 1 – Using Proportions, School Population: Method 2, Grades Problem: Method 1 – Using Proportions, Grades Problem: Method 2, Bike Sale: Method 1 – Using Proportions, Bike Sale: Method 2; Steps in Solving Problems; Finding the Whole; Finding the Percent; Percent of a Number; Percents Greater than 100 %; Percents less than 1 %; Mental Calculation; Percent Change; Practice Questions

- *at Level 3, the student is able to*

⇒ 8.1.spi.10. use exponential, scientific, and calculator notation to represent large numbers in real-world situations;

MAT+ / Understanding Exponents / Topic 1 – The Meaning of Exponents / Introduction – The Money Game; Introduction – Bacteria Doubling; Introduction – Paper Folding; Exponents, Powers, Bases; Powerful Explosions; Introductory Examples 1 through 5; Examples – Substitution; Examples - Order of Operation; Practice Questions; Topic Test

MAT+ / Understanding Exponents / Topic 2 – Exponents in Formulas / The Power Key: An Introduction, Power with a Positive Base, Power with a Negative Base, Adding Two Powers – Long/Short Way; An Introduction to Formulas; Area Formulas Involving Exponents; Volume Formulas Involving Exponents; Examples with Area Formulas: Examples 1,2,3

MAT+ / Understanding Exponents / Topic 4 – Scientific Notation / Why Use Scientific Notation?; Scientific Notation for Large Numbers: Introduction, Chart, The Rule, The Steps; Scientific Notation for Small Numbers: Introduction, Chart, The Steps; Examples: 1 through 4; Practice Questions

⇒ 8.1.spi.11. apply order of operations in computing with rational numbers using no more than two parentheses and exponents 1 and 2.

MAT+ / Understanding Fractions / Topic 12 – Order of Operations / Order in Addition: Trials 1,2, Conclusion, Examples 1,2; Order in Multiplication: Trials 1,2, Conclusion, Examples 1 & 2; Why Use Order of Operations? BEDMAS; Examples Questions: Examples 1 through 3; Practice Questions; Topic Test

Algebra

Content Standard 2.0

The student will understand and generalize patterns as they represent and analyze quantitative relationships and change in a variety of contexts and problems using graphs, tables, and equations.

Learning Expectations:

2.1 Understand patterns, relations, and functions.

2.2 Represent and analyze mathematical situations and structures using algebraic symbols.

MAT+ / Understanding Algebra / Topic 3 – Patterns, Patterns, Patterns /

Introduction: Math is Patterns; Geometric Patterns: Examples 1 through 8; Number Patterns: Examples 1 through 6; Number and Geometric Patterns: Examples 1 & 2; Patterns to Formulas: Examples 1,2,3; Factor Pairs in Arrays: Factors 8, 12, 16, 20, 5, 15, 18; Prime and Composite: Prime Numbers, Composite Numbers; Common Factors/GCF: Examples 1& 2; Patterns in the Multiplication Table; Sieve of Eratosthenes; Patterns with 9; Practice Questions; Topic Test

MAT+ / Understanding Algebra / Topic 4 – Patterns, Formulas, Substitution /

Introduction – Math is Patterns; Expressions, Terms, Variables; Patterns to Formulas: Examples 1,2,3; Substitution is – Math Scrabble; Substitution Examples; Practice Questions; Topic Test

2.3 Use mathematical models to represent and understand quantitative relationships.

2.4 Analyze change in various contexts.

Eighth Grade Benchmarks Performance Indicators State: As documented through state assessment

– *at Level 1, the student is able to*

⇒ 8.2.spi.1. generalize a variety of patterns with symbolic rules;

⇒ 8.2.spi.2. evaluate a first-degree algebraic expression given values for two or more variables.

MAT+ / Understanding Algebra / Topic 4 – Patterns, Formulas, Substitution /

Introduction – Math is Patterns; Expressions, Terms, Variables; Patterns to Formulas: Examples 1,2,3; Substitution is – Math Scrabble; Substitution Examples; Practice Questions; Topic Test

MAT+ / Understanding Algebra / Topic 5 – Adding Expressions /

Our Problem; Adding Expressions with X & Y Tiles; Adding Expressions with X-squared Tiles; Adding Expressions without Tiles; Practice Questions: With/Without Tiles

- at Level 2, the student is able to

⇒ 8.2.spi.3. represent situations and solve real-world problems using symbolic algebra;

⇒ 8.2.spi.4. connect symbolic expressions and graphs of lines;

MAT+ / Understanding Graphing / Topic 6 – Linear Relations / What is a Linear Relation?; Graphs of Linear Relations: Concept, Examples 1 through 6; The Taxi Example; The Elastic Example; Lightening Example; Practice Questions

⇒ 8.2.spi.5. generate equivalent forms for simple algebraic expressions;

MAT+ / Understanding Algebra / Topic 4 – Patterns, Formulas, Substitution / Introduction – Math is Patterns; Expressions, Terms, Variables; Patterns to Formulas: Examples 1,2,3; Substitution is – Math Scrabble; Substitution Examples; Practice Questions; Topic Test

MAT+ / Understanding Algebra / Topic 5 – Adding Expressions / Our Problem; Adding Expressions with X & Y Tiles; Adding Expressions with X-squared Tiles; Adding Expressions without Tiles; Practice Questions: With/Without Tiles

⇒ 8.2.spi.6. solve one- and two-step linear equations involving integers;

⇒ 8.2.spi.7. apply given formulas to solve real-world problems;

MAT+ / Understanding Equations / Topic 2 – Solving One-Step Equations / Our Problem; Concepts – Examples with Tiles 1 through 4; Concepts – Examples without Tiles; Practice Questions; Topic Test

MAT+ / Understanding Equations / Topic 3 – Solving Two-Step Equations / Our Problem; Concepts – Examples with Tiles 1 through 5; Concepts – Examples without Tiles 1 through 6; Practice Questions; Topic Test

⇒ 8.2.spi.8. interpret graphs which represent rates of change.

- at Level 3, the student is able to

⇒ 8.2.spi.9. formulate multi-step equations that represent relationships and real-world situations;

⇒ 8.2.spi.10. solve one-step linear inequalities;

MAT+ / Understanding Equations / Topic 7 – Solving Inequalities / Comparing Integers: The Integer Line, Examples 1 through 4, Greater Than or Less Than; Inequalities: What are They?; Inequality vs. Equations, Summary of Relationships; Inequality on the Number Line: Examples 1 through 4; Solving Inequalities: Examples 1 through 6

⇒ 8.2.spi.11. connect the appropriate graph to a linear equation.

MAT+ / Understanding Graphing / Topic 6 – Linear Relations / What is a Linear Relation?; Graphs of Linear Relations: Concept, Examples 1 through 6; The Taxi Example; The Elastic Example; Lightening Example; Practice Questions

Geometry

Content Standard 3.0

The student will develop an understanding of geometric concepts and relationships as the basis for geometric modeling and reasoning to solve problems involving one-, two-, and three-dimensional figures.

Learning Expectations:

3.1 Analyze characteristics and properties of two- and three-dimensional geometric figures.

MAT+ / Understanding Measurement and Geometry / Topic 2-Perimeter and Area of Polygons / Polygons – What are they?: Concept, A Triangle is, A Quadrilateral is, A Pentagon is, A Hexagon is, An Octagon is, Classify Polygons

MAT+ / Understanding Measurement and Geometry / Topic 4 – Solids- Volume and Surface Area / In This Topic; Classifying Solids: A Solid is..., Recall Polygons, A Polyhedron is, A Prism is, Some Special Pyramids, A Cylinder is, A Cone is, Platonic Solids

3.2 Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

3.3 Apply transformations and use symmetry to analyze mathematical situations.

MAT+ / Understanding Graphing / Topic 4 – Transformations / In This Topic; What is a Transformation?; Introduction to Common Transformations; Translations – An Introduction, Slide #1, #2, #3, #4; Reflections – An Introduction, Flip #1, #2, #3, #4; Rotations – An Introduction, Turn #1, #2, #3, #4; The Transformation Machine: Examples 1 through 5; Lines of Symmetry – An Introduction: Introduction, Examples 1 through 4; Symmetry Match: Puzzle 1,2; Tessellations: Introduction, Examples 1 through 5; Tangrams: Introduction, Examples 1,2,3; Translations: Object to Image, We Say, We Write, Reflection Mapping Rule, Examples 1,2,3; Rotations: Object to Image, We Say, We Write, Rotation Mapping Rule, Examples 1,2,3; Dilatations: Object to Image, We Say, We Write, Rotation Mapping Rule, Examples 1,2; Examples 1 & 2; Practice Questions; Topic Test

3.4 Use visualization, spatial reasoning, and geometric modeling to solve problems.

Eighth Grade Benchmarks Performance Indicators State: As documented through state assessment

– *at Level 1, the student is able to*

⇒ 8.3.spi.1. classify types of two- and three-dimensional geometric figures using their defining properties;

MAT+ / Understanding Measurement and Geometry / Topic 2-Perimeter and Area of Polygons / Polygons – What are they?: Concept, A Triangle is, A Quadrilateral is, A Pentagon is, A Hexagon is, An Octagon is, Classify Polygons

MAT+ / Understanding Measurement and Geometry / Topic 4 – Solids- Volume and Surface Area / In This Topic; Classifying Solids: A Solid is..., Recall Polygons, A Polyhedron is, A Prism is, Some Special Pyramids, A Cylinder is, A Cone is, Platonic Solids

⇒ 8.3.spi.2. use ordered pairs to describe given points in a coordinate system.

MAT+ / Understanding Graphing / Topic 3 – Points on a Grid / Ordered Pairs: Axis, Quadrants, Find a Point, Order in Important, Examples; Shapes, Battleship

- *at Level 2, the student is able to*

⇒ 8.3.spi.3. identify relationships among angles (i.e., complementary, supplementary, interior, exterior, vertical, corresponding);

MAT+ / Understanding Measurement and Geometry / Topic 5 – Angles and Their Measure / Classifying Angles: Classifications, Memory Game; Measuring Angles; Practice Questions; Topic Test

MAT+ / Understanding Measurement and Geometry / Topic 6 – Angles and Polygons / Parallel Lines; Example with Parallel Lines; Angles in Triangles: Exploration, An Explanation, Exterior Angles; Angles in Polygons: Methods 1 & 2, Exterior Angles in a Polygon

⇒ 8.3.spi.4. recognize similar geometric figures;

MAT+ / Understanding Measurement and Geometry / Topic 2-Perimeter and Area of Polygons / Polygons – What are they?: Concept, A Triangle is, A Quadrilateral is, A Pentagon is, A Hexagon is, An Octagon is, Classify Polygons

MAT+ / Understanding Measurement and Geometry / Topic 4 – Solids- Volume and Surface Area / In This Topic; Classifying Solids: A Solid is..., Recall Polygons, A Polyhedron is, A Prism is, Some Special Pyramids, A Cylinder is, A Cone is, Platonic Solids

⇒ 8.3.spi.5. determine the measure of an angle of a triangle given the measures of the other two angles;

MAT+ / Understanding Measurement and Geometry / Topic 6 – Angles and Polygons / Angles in Triangles: Exploration, An Explanation, Exterior Angles

⇒ 8.3.spi.6. apply relationships among angles and side lengths of similar geometric figures;

MAT+ / Understanding Measurement and Geometry / Topic 6 – Angles and Polygons / Parallel Lines; Example with Parallel Lines; Angles in Triangles: Exploration, An Explanation, Exterior Angles; Angles in Polygons: Methods 1 & 2, Exterior Angles in a Polygon

⇒ 8.3.spi.7. apply spatial reasoning and visualization to solve real-world problems.

MAT+ / Understanding Measurement and Geometry / Topic 8 – Projective Geometry / An Introduction; Toothpicks on Isometric Dot Paper: Toothpick to Cube,

The Views, Using Isometric Grid Paper; Orthographic Projections: Introduction; The Cube Too: Introduction, Tutorial, Play with Tool; Given Solid – Build it, Examples 1 through 6; Given View – Build it, Examples 1 through 6; Given Volume – Build it, Examples 1 through 6; Given Area – Build it, Examples 1 through 6; Practice Questions

- *at Level 3, the student is able to*

⇒ 8.3.spi.8. apply geometric ideas and relationships in areas outside the mathematics classroom (i.e., art, science, everyday life);

⇒ 8.3.spi.9. solve problems using angle relationships (i.e., complementary, supplementary, interior, exterior, vertical, corresponding).

MAT+ / Understanding Measurement and Geometry / Topic 6 – Angles and Polygons / Parallel Lines; Example with Parallel Lines; Angles in Triangles: Exploration, An Explanation, Exterior Angles; Angles in Polygons: Methods 1 & 2, Exterior Angles in a Polygon

Measurement

Content Standard 4.0

The student will become familiar with the units and processes of measurement in order to use a variety of tools, techniques, and formulas to determine and to estimate measurements in mathematical and real-world problems.

Learning Expectations:

4.1 Understand measurable attributes of objects and the units, systems, and processes of measurement.

4.2 Apply appropriate techniques, tools, and formulas to determine measurements.

MAT+ / Understanding Measurement and Geometry / Topic 1 – An Introduction to Measurement / Measurement in the News; A Glimpse into the Past; Metric and U.S.A. Standard Measurement Systems: Searching for the Standard Unit, Related Units for Metric Prefixes, Metric Prefixes at Work, Converting Between Metric Prefixes, Measurements with a Ruler: Introduction to the Ruler, Centimeters #1, #2, Inches #1, #2; Calculating Distances: Using Centimeters, Examples 1 through 6, Using Inches, Examples 1 through 6; Benchmarks: Establishing Benchmarks, Meter Benchmarks, Foot Benchmarks, Centimeter Benchmarks, Inch Benchmarks, Yard Benchmarks, Our Benchmarks, Using Benchmarks, Converting Between Metric Units; My Body; Rudy’s Run; Practice Questions; Topic Test

Eighth Grade Benchmarks Performance Indicators State: As documented through state assessment

- *at Level 1, the student is able to*

⇒ 8.4.spi.1. select units of appropriate size and type to measure angles, perimeter, area, surface area, and volume;

MAT+ / Understanding Measurement and Geometry / Topic 2-Perimeter and Area of Polygons / Perimeter of Various Shapes, Examples 1,2,3; Perimeter of the Ranch;

Amount of Surface: The Driveway – An Introduction to Area; Area – Estimation; Area of a Rectangle; Relationship – Area and Perimeter: The Information, The Graph; Given Area and Perimeter – Create Shapes: Examples 1 through 4; Practice Questions

MAT+ / Understanding Measurement and Geometry / Topic 4 – Solids- Volume and Surface Area / Volume of a Solid: The Concept; Volume of a Prism, Volume of a Cylinder, Volume of a Pyramid

MAT+ / Understanding Measurement and Geometry / Topic 5 – Angles and Their Measure / In This Topic; Lines and Rays; Angles – An Introduction; the Degree; Classifying Angles: Classifications, Memory Game; Measuring Angles; Practice Questions; Topic Test

⇒ 8.4.spi.2. convert from one unit to another within the same system.

MAT+ / Understanding Measurement and Geometry / Topic 1 – An Introduction to Measurement / Metric and U.S.A. Standard Measurement Systems: Converting Between Metric Prefixes; Benchmarks: Establishing Benchmarks, Meter Benchmarks, Foot Benchmarks, Centimeter Benchmarks, Inch Benchmarks, Yard Benchmarks, Our Benchmarks, Using Benchmarks, Converting Between Metric Units; My Body; Rudy’s Run; Practice Questions; Topic Test

at Level 2, the student is able to

⇒ 8.4.spi.3. estimate length, perimeter, circumference, area, and volume using a variety of strategies;

⇒ 8.4.spi.4. apply formulas to find the area of triangles, parallelograms, and trapezoids;

⇒ 8.4.spi.7. estimate or find the area of irregular and complex shapes.

MAT+ / Understanding Measurement and Geometry / Topic 3 – The Circle / In This Topic; Circle All Around Us!; Radius, Circumference, Diameter; PI... A Special Number: Introduction, How do we Measure Circumference?, Measuring Circles, Summary; Circumference of a Circle: Circumference, Examples 1 through 4; Area of a Circle: Recall Area, Area Explorations 1 & 2, Examples 1 through 5; Practice Questions; Topic Test

MAT+ / Understanding Measurement and Geometry / Topic 2-Perimeter and Area of Polygons / Perimeter of Various Shapes, Examples 1,2,3; Perimeter of the Ranch; Amount of Surface: The Driveway – An Introduction to Area; Area – Estimation; Area of a Rectangle; Relationship – Area and Perimeter: The Information, The Graph; Given Area and Perimeter – Create Shapes: Examples 1 through 4; Practice Questions

MAT+ / Understanding Measurement and Geometry / Topic 4 – Solids- Volume and Surface Area / Volume of a Solid: The Concept; Volume of a Prism, Volume of a Cylinder, Volume of a Pyramid

⇒ 8.4.spi.5. solve real-world problems involving rate/time/distance (i.e., $d = rt$);

⇒ 8.4.spi.6. apply formulas to find the circumference and area of circles;
MAT+ / Understanding Measurement and Geometry / Topic 3 – The Circle / In This Topic; Circle All Around Us!; Radius, Circumference, Diameter; PI...A Special Number: Introduction, How do we Measure Circumference?, Measuring Circles, Summary; Circumference of a Circle: Circumference, Examples 1 through 4; Area of a Circle: Recall Area, Area Explorations 1 & 2, Examples 1 through 5; Practice Questions; Topic Test

- *at Level 3, the student is able to*

⇒ 8.4.spi.8. solve problems involving scale factors using ratios and proportions;
MAT+ / Understanding Fractions / Topic 7 – Ratios and Proportions / Ratios in the News; What is a Ratio? Examples 1 through 4; Writing Ratios: Concept, Examples 1 through 4; What is Proportion?: Examples 1 through 4; Ratios and Your Body: Golden Ratio, Measuring Your Body; Practice Questions; Topic Test

MAT+ / Understanding Measurement and Geometry / Topic 9 – Ratios for Areas and Volumes / In This Topic; Ratios for Areas and Volumes: Introduction, Area Ratios, Volume Ratios; Practice Questions; Topic Test

⇒ 8.4.spi.9. solve real-world problems using the Pythagorean Theorem (no radicals).
MAT+ / Understanding Exponents / Topic 6 – Pythagorean Theorem / The Right Triangle; Math or Magic?; Squares on a Grid; Squares on the Sides of a Right Triangle; The Pythagorean Theorem; Examples Questions; Practice Questions

Data Analysis and Probability

Content Standard 5.0

The student will understand and apply basic statistical and probability concepts in order to organize and analyze data and to make predictions and conjectures.

Learning Expectations:

5.1 Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer questions.

5.2 Select and use appropriate statistical methods to analyze data.

5.3 Develop and evaluate inferences and predictions that are based on data.

MAT+ / Understanding Graphing / Topic 2 – Statistics / An Introduction: Tally Chart, Pictographs 1 & 2, Bar Graph 1 & 2, Line Graph 1 & 2; Data – What is it?; Examples of Data: Examples 1 through 6, Summary; Statistics – What is it?; Collecting Data: Throw a Die, Throw 2 Dice, Voting, Primary Data & Secondary Data – Gathering Methods

5.4 Understand and apply basic concepts of probability.

MAT+ / Understanding Probability / Topic 1 – An Introduction to Probability / The Language of Chance; Impossible to Certain: Activities 1 & 2; Probability Lines: Lines 1 & 2; Experiments with Spinners: Experiments 1 through 6; The Spinner Game: Boards 1 & 2; IT's in the Bag; Tree Diagrams: Meals, Socks; Practice Questions; Topic Test

MAT+ / Understanding Probability / Topic 2 – What’s the Chance? / Probability: What is it? Introduction 1, Introduction 2; Probability Examples 1 through 12; The Probability Scale: Examples, Summary, Follow Up, Soccer Example; Experimental Probability: Introduction; Examples 1 & 2; Practice Questions

Eighth Grade Benchmarks Performance Indicators State: As documented through state assessment

– *at Level 1, the student is able to*

⇒ 8.5.spi.1. identify an appropriate sample to test a given hypothesis.

MAT+ / Understanding Probability / Topic 1 – An Introduction to Probability / The Language of Chance; Impossible to Certain: Activities 1 & 2; Probability Lines: Lines 1 & 2; Experiments with Spinners: Experiments 1 through 6; The Spinner Game: Boards 1 & 2; IT’s in the Bag; Tree Diagrams: Meals, Socks; Practice Questions; Topic Test

MAT+ / Understanding Probability / Topic 2 – What’s the Chance? / Probability: What is it? Introduction 1, Introduction 2; Probability Examples 1 through 12; The Probability Scale: Examples, Summary, Follow Up, Soccer Example; Experimental Probability: Introduction; Examples 1 & 2; Practice Questions

- *at Level 2, the student is able to*

⇒ 8.5.spi.2. interpret appropriate graphical representations of data (i.e., histograms, box plots, scatterplots);

MAT+ / Understanding Graphing / Topic 2 – Statistics /Histogram, Line Graph, Circle or Pie Graphs, Scatter Plot; Box and Whisker Plots: Concepts, Examples

⇒ 8.5.spi.3. determine the mean of a given set of real-world data;

MAT+ / Understanding Graphing / Topic 2 – Statistics / Measures of Central Tendency: Introduction, The Mean Average, The Median Average, The Mode, Summary, Another Example, Adding Data Points

⇒ 8.5.spi.4. connect data sets and their graphical representations (i.e., histograms, stem-and-leaf plots, box plots, scatterplots);

MAT+ / Understanding Graphing / Topic 2 – Statistics /Histogram, Line Graph, Circle or Pie Graphs, Scatter Plot; Box and Whisker Plots: Concepts, Examples

⇒ 8.5.spi.5. make conjectures and predictions based on data;

⇒ 8.5.spi.6. connect the symbolic representation of a probability to an experiment.

MAT+ / Understanding Probability / Topic 1 – An Introduction to Probability / The Language of Chance; Impossible to Certain: Activities 1 & 2; Probability Lines: Lines 1 & 2; Experiments with Spinners: Experiments 1 through 6; The Spinner Game: Boards 1 & 2; IT’s in the Bag; Tree Diagrams: Meals, Socks; Practice Questions; Topic Test

MAT+ / Understanding Probability / Topic 2 – What’s the Chance? / Probability: What is it? Introduction 1, Introduction 2; Probability Examples 1 through 12; The

Probability Scale: Examples, Summary, Follow Up, Soccer Example; Experimental Probability: Introduction; Examples 1 & 2; Practice Questions

MAT+ / Understanding Probability / Topic 4 – Binomial Probabilities / What are They?; Flipping a Coin...Once, Twice, Three Times; Summary; Practice Questions; Topic Test

- at Level 3, the student is able to

⇒ 8.5.spi.7. determine the median of a given set of real-world data (even number of data);

MAT+ / Understanding Graphing / Topic 2 – Statistics / Measures of Central Tendency: Introduction, The Median Average

⇒ 8.5.spi.8. recognize misleading presentations of data.

MAT+ / Understanding Graphing / Topic 2 – Statistics / Misleading Statistics: Examples 1 & 2