

**CORRELATION**  
**of**  
**the 10 UNDERSTANDING MATH PLUS PROGRAMS & UNDERSTANDING NUMERATION PLUS PROGRAMS**  
**with**  
**South Carolina MATHEMATICS CURRICULUM STANDARDS**  
**Grades 3–5: Geometry**

**Note: a.** The Understanding Math PLUS series of programs consist of 10 programs written for Kindergarten to 10<sup>th</sup> 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 3<sup>rd</sup> grade.

Level	Upper Range of Number
<b>A</b>	<b>10</b>
<b>B</b>	<b>20</b>
<b>C</b>	<b>100</b>
<b>D</b>	<b>1000</b>

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

A detailed Lesson Synopsis on the website [www.neufeldmath.com](http://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 4<sup>th</sup> to 10<sup>th</sup> 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
- ..a topic test with random questions and tracking
- ..off computer worksheets selected from the website .. [www.neufeldmath.com](http://www.neufeldmath.com)

**STANDARD I. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.**

**EXPECTATION A. Identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes.**

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
<p>*1. Using appropriate vocabulary, identify and describe attributes of polygons including triangles, quadrilaterals (rectangles, squares, other parallelograms, trapezoids), pentagons, hexagons, and octagons.</p>	<p><b>MAT+ <u>Understanding Measurement and Geometry</u></b>  <b>Topic 2. Perimeter and Area of Polygons</b>            Polygons... What Are They?            Concept            A Triangle is            A Quadrilateral is            A Pentagon is            A Hexagon is            An Octagon is            Classify Polygons</p>	<p>*1. Choose appropriate models of two- and three-dimensional shapes from descriptions of attributes.</p>	<p><b>MAT+ <u>Understanding Measurement and Geometry</u></b>  <b>Topic 2. Perimeter and Area of Polygons</b>            Classify Polygons</p> <p><b>Topic 4. Solids... Volume and Surface Area</b>            Classifying Solids            A Solid is...            Recall Polygons            A Polyhedron is...            A Prism is...            Some Special Pyramids            A Cylinder is...            A Cone is...            Platonic Solids</p>	<p>1. Using models and appropriate vocabulary, compare and analyze attributes of polygons, attributes of polyhedra, and attributes of cones and cylinders.</p>	
<p>*2. Using appropriate vocabulary, describe properties of circles (center, radius, and diameter).</p>	<p><b>MAT+ <u>Understanding Measurement and Geometry</u></b>  <b>Topic 3. The Circle</b>            Circles All Around</p>				

	Us! Radius, Circumference, Diameter				
*3. Using appropriate vocabulary, identify and describe attributes of three-dimensional shapes including prisms, pyramids, spheres, cones, and cylinders.	<b>MAT+</b> <u><b>Understanding Measurement and Geometry</b></u> <b>Topic 4.</b> <b>Solids... Volume and Surface Area</b> Classifying Solids A Solid is... Recall Polygons A Polyhedron is... A Prism is... Some Special Pyramids A Cylinder is... A Cone is... Platonic Solids				

**EXPECTATION B.** Classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids.

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
1. Classify three-dimensional shapes according to their attributes.	<p><b>MAT+</b>  <u><b>Understanding Measurement and Geometry</b></u>  <b>Topic 2. Perimeter and Area of Polygons</b>            Classifying Polygons</p> <p><b>Topic 4. Solids... Volume and Surface Area</b>            Classifying Solids            A Solid is...            Recall Polygons            A Polyhedron is...            A Prism is...            Some Special Pyramids            A Cylinder is...            A Cone is...            Platonic Solids</p>	*1. Classify triangles by lengths of sides (scalene, isosceles, and equilateral) and sizes of angles (acute, obtuse, and right).	<p><b>MAT+</b>  <u><b>Understanding Measurement and Geometry</b></u>  <b>Topic 2. Perimeter and Area of Polygons</b>            A Triangle is</p>	<p>*1. Using models and appropriate vocabulary classify quadrilaterals, polyhedra, cones, and cylinders according to their attributes.</p> <p>2. Develop definitions for classes of two- and three-dimensional shapes.</p>	<p><b>MAT+</b>  <u><b>Understanding Measurement and Geometry</b></u>  <b>Topic 4. Solids... Volume and Surface Area</b>            Classifying Solids            A Solid is...            Recall Polygons            A Polyhedron is...            A Prism is...            Some Special Pyramids            A Cylinder is...            A Cone is...</p>

**EXPECTATION C. Investigate, describe, and reason about the results of subdividing, combining, and transforming shapes.**

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
1. Combine two-dimensional shapes to form new shapes and draw conclusions about area and fractional relationships.	<b>MAT+</b> <u><b>Understanding Measurement and Geometry</b></u> <b>Topic 2. Perimeter and Area of Polygons</b> Amount of Surface The Driveway... An Introduction to Area Area – Estimation Area of a Rectangle Concept Examples 1, 2	1. Subdivide two-dimensional shapes to form new shapes and draw conclusions about area and fractional relationships.	<b>MAT+</b> <u><b>Understanding Measurement and Geometry</b></u> <b>Topic 2. Perimeter and Area of Polygons</b> Area – Estimation Area of a Rectangle Concept Examples 1, 2		

**EXPECTATION D. Explore congruence and similarity.**

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
*1. Compare two-dimensional shapes to determine if they exactly match (congruency).				*1. Compare two-dimensional shapes to determine if they are similar by transformations of magnifying or shrinking.	

**EXPECTATION E.** Make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions.

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
1. Using models, make and test conjectures about geometric properties and relationships and explain the conclusions.		1. Using models and mathematical vocabulary, make and test conjectures about geometric properties and relationships and explain the conclusions.		*1. Make and test conjectures about geometric properties and relationships and then develop logical arguments to justify the conclusions.	

**STANDARD** II. Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

**EXPECTATION** A. Describe location and movement using common language and geometric vocabulary.

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
1. Give instructions (direction, distance, turns) for moving from one location to another.	<b>MAT+</b> <b><u>Understanding Graphing</u></b> <b>Topic 4. Transformations</b> What is a Transformation? Introduction to Common Transformations Translations - An Introduction	1. Describe location and movement using common language and geometric vocabulary and illustrate both with and without technology.	<b>MAT+</b> <b><u>Understanding Graphing</u></b> <b>Topic 4. Transformations</b> Slide #1, #2, #3, #4 Reflections - An Introduction Flip #1, #2, #3 Rotations - An Introduction Turn #1, #2, #3, #4, #5		

**EXPECTATION B. Make and use coordinate systems to specify locations and to describe paths.**

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
1. Specify locations on maps and grids using direction and distance.	<b>MAT+</b> <b><u>Understanding Graphing</u></b> <b>Topic 3. Points on a Grid</b> In This Topic Josh's Neighborhood Concept Number Houses Grids on Maps	*1. Investigate possible paths from one point to another along vertical and horizontal grid-lines.  2. Identify and name points on a coordinate grid using an ordered pair of whole numbers.	<b>MAT+</b> <b><u>Understanding Graphing</u></b> <b>Topic 3. Points on a Grid</b> Ordered Pairs Axis	*1. Using ordered pairs of numbers, locate and name points in the first quadrant of a coordinate system.	<b>MAT+</b> <b><u>Understanding Graphing</u></b> <b>Topic 3. Points on a Grid</b> Ordered Pairs Axis Quadrants and Cartesian Plane Find a Point Order is Important Examples
*2. Locate points corresponding to given whole numbers on a number line.					

**EXPECTATION C. Find the distance between points along horizontal and vertical lines of a coordinate system.**

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
				*1. Find the distance between points in the first quadrant of a coordinate system along horizontal and vertical lines.	

**STANDARD III. Apply transformations and use symmetry to analyze mathematical situations.**

**EXPECTATION A. Predict and describe the results of sliding, flipping, and turning two-dimensional shapes.**

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
		<p>1. Using models, describe the results of translations (slides), reflections (flips), and rotations (turns).</p> <p>2. Using models and technology, create simple tessellations.</p>	<p><b>MAT+ <u>Understanding Graphing</u> Topic 4. Transformations</b>            Translations - An Introduction            Slide #1, #2, #3, #4            Reflections - An Introduction            Flip #1, #2, #3            Rotations - An Introduction            Turn #1, #2, #3, #4, #5            The Transformation Machine            Examples 1, 2, 3, 4, 5            Tessellations            Introduction            Examples            Examples 1, 2, 3, 4, 5</p>	<p>*1. Predict the results of geometric motion of shapes including combinations of translations (slides), reflections (flips), and rotations (turns).</p>	<p><b>MAT+ <u>Understanding Graphing</u> Topic 4. Transformations</b>            Translations            Object to Image            We Say            We Write            Reflection Mapping Rule            Examples            Examples 1, 2, 3            Rotations            Object to Image            We Say            We Write            Rotation Mapping Rule            Examples            Examples 1, 2</p>

**EXPECTATION B.** Describe a motion or a series of motions that will show that two shapes are congruent.

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
<p>1. Use slides, flips, and turns informally with models to determine whether or not two shapes are congruent.</p>	<p><b>MAT+</b>  <u><b>Understanding Graphing</b></u>  <b>Topic 4. Transformations</b>            Translations - An Introduction            Slide #1, #2, #3, #4            Reflections - An Introduction            Flip #1, #2, #3            Rotations - An Introduction            Turn #1, #2, #3, #4, #5            The Transformation Machine            Examples 1, 2, 3, 4, 5</p>	<p>*1. Draw two-dimensional shapes that are related by translation (slide) or reflection (flip).             2. Given a shape and its translation (slide) or reflection (flip), describe the motion that has been applied.</p>	<p><b>MAT+</b>  <u><b>Understanding Graphing</b></u>  <b>Topic 4. Transformations</b>            Translations            Object to Image            We Say            We Write            Reflection Mapping Rule            Examples            Examples 1, 2, 3            Rotations            Object to Image            We Say            We Write            Rotation Mapping Rule            Examples            Examples 1, 2</p>	<p>1. Describe series of motions that may be used to show that two shapes are congruent.</p>	

**EXPECTATION C. Identify and describe line and rotational symmetry in two- and three-dimensional shapes and designs.**

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
*1. Identify and describe the line symmetry of two-dimensional shapes.	<b>MAT+</b> <u><b>Understanding Graphing</b></u> <b>Topic 4. Transformations</b> Line of Symmetry - An Introduction Introduction Examples 1, 2, 3, 4 Symmetry Match Puzzle 1, 2			*1. Determine whether given two-dimensional shapes and designs have rotational symmetry.  2. Investigate and describe symmetry and congruence of shapes drawn on a grid.	<b>MAT+</b> <u><b>Understanding Graphing</b></u> <b>Topic 4. Transformations</b> Line of Symmetry - An Introduction Introduction Examples 1, 2, 3, 4 Symmetry Match Puzzle 1, 2

**STANDARD IV. Use visualization, spatial reasoning, and geometric modeling to solve problems.**

**EXPECTATION A. Build and draw geometric objects.**

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
*1. Create representations of points, lines (intersecting, perpendicular, and parallel), line segments (including intersecting and parallel), rays, and angles in a plane.	<b>MAT+</b> <u><b>Understanding Measurement and Geometry</b></u> <b>Topic 5. Angles and their Measure</b> In This Topic Lines and Rays Angles... An Introduction The Degree  <b>Topic 6. Angles and Polygons</b> Parallel Lines Example with Parallel Lines Examples 1, 2	*1. Draw and label representations of points, lines, line segments, rays, and angles, using mathematical notation.	<b>MAT+</b> <u><b>Understanding Measurement and Geometry</b></u> <b>Topic 5. Angles and their Measure</b> In This Topic Lines and Rays Angles... An Introduction The Degree  <b>Topic 6. Angles and Polygons</b> Parallel Lines Example with Parallel Lines Examples 1, 2		
*2. Build and draw two-dimensional geometric objects.	<b>MAT+</b> <u><b>Understanding Measurement and Geometry</b></u> <b>Topic 7. Constructions</b> Before You Begin In This Topic Perpendicular Bisector Circumcircle			*1. Build and draw three-dimensional objects.	<b>MAT+</b> <u><b>Understanding Measurement and Geometry</b></u> <b>Topic 8. Projective Geometry</b> An Introduction Toothpicks on Isometric Dot Paper Toothpick to Cube The Views Using Isometric Grid

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**EXPECTATION B. Create and describe mental images of objects, patterns, and paths.**

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
1. Identify two-dimensional shapes given a verbal description.	<b>MAT+</b> <u><b>Understanding Measurement and Geometry</b></u> <b>Topic 2. Perimeter and Area of Polygons</b> Polygons... What Are They? Concept A Triangle is A Quadrilateral is A Pentagon is A Hexagon is An Octagon is Classify Polygons	*1. Write a description of a given three-dimensional object.	<b>MAT+</b> <u><b>Understanding Measurement and Geometry</b></u> <b>Topic 4. Solids... Volume and Surface Area</b> Classifying Solids A Solid is... Recall Polygons A Polyhedron is... A Prism is... Some Special Pyramids A Cylinder is... A Cone is... Platonic Solids	*1. Sketch the front, top, and side views of a model of a three-dimensional shape built with cubes.	<b>MAT+</b> <u><b>Understanding Measurement and Geometry</b></u> <b>Topic 8. Projective Geometry</b> An Introduction Toothpicks on Isometric Dot Paper Toothpick to Cube The Views Using Isometric Grid Paper Orthographic Projections: Introduction
2. Describe the path that results from following specific directions in moving from one location to another.		2. Describe a path along grid lines from one point to another.			
		3. Given a verbal description, draw two- or three-dimensional objects.	<b>MAT+</b> <u><b>Understanding Measurement and Geometry</b></u> <b>Topic 8. Projective Geometry</b> An Introduction Toothpicks on Isometric Dot Paper Toothpick to Cube		

			The Views Using Isometric Grid Paper		
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**EXPECTATION C. Identify and build a three-dimensional object from two-dimensional representations of that object.**

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
1. Identify and build a cube from its two-dimensional representation (net).	<b>MAT+</b> <b><u>Understanding Measurement and Geometry</u></b> <b>Topic 8. Projective Geometry</b> Orthographic Projections: Introduction The Cube Tool Introduction Tutorial Play with Tool	*1. Identify and build rectangular prisms and cylinders from a given two-dimensional representation (net).	<b>MAT+</b> <b><u>Understanding Measurement and Geometry</u></b> <b>Topic 8. Projective Geometry</b> Given Solid – Build it Examples 1, 2, 3, 4, 5, 6 Given Views – Build it Examples 1, 2, 3, 4, 5, 6		

**EXPECTATION D. Identify and build a two-dimensional representation of a three-dimensional object.**

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
1. Identify and build a two-dimensional representation (net) of a cube.	<b>MAT+</b> <u><b>Understanding Measurement and Geometry</b></u> <b>Topic 8. Projective Geometry</b> Orthographic Projections: Introduction The Cube Tool Introduction Tutorial Play with Tool	1. Identify and build a two-dimensional representation (net) of a given rectangular prism.	<b>MAT+</b> <u><b>Understanding Measurement and Geometry</b></u> <b>Topic 8. Projective Geometry</b> Given Solid – Build it Examples 1, 2, 3, 4, 5, 6 Given Views – Build it Examples 1, 2, 3, 4, 5, 6		

**EXPECTATION E. Use geometric models to solve problems in other areas of mathematics, such as number and measurement.**

*For all three grade levels, refer to these concepts in the “Number and Operations” and the “Measurement” strands.*

**EXPECTATION F.** Recognize geometric ideas and relationships and apply them to other disciplines and to problems that arise in the classroom or in everyday life.

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	Understanding Math PLUS and/or Understanding Numerations PLUS
		1. Connect geometry to other areas of mathematics, to other disciplines, and to the world outside the classroom.	<b>MAT+</b> <b><u>Understanding</u></b> <b><u>Measurement and</u></b> <b><u>Geometry</u></b> <i>All Sections</i>		