

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

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

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

EXPECTATION A. Understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute.

3	Understanding Math PLUS and/or Understanding Numerations PLUS	4	Understanding Math PLUS and/or Understanding Numerations PLUS	5	
1. Use a variety of objects to measure length (e.g., width, height, perimeter), volume, weight/mass, and area (e.g., cubes, grid, paper, string, squares).	<p>MAT+ <u>Understanding Measurement and Geometry</u> Topic 2. Perimeter and Area of Polygons Walk Around a Polygon Joan Walks Length of the Metal Strip Find the Perimeter Amount of Surface The Driveway... An Introduction to Area Area – Estimation Area of a Rectangle</p> <p>Topic 4. Solids... Volume and Surface Area Volume of a Solid The Concept</p>	1. Apply counting procedures to estimate measurements of length, area, volume, and weight/mass.	<p>MAT+ <u>Understanding Measurement and Geometry</u> Topic 1. An Introduction to Measurement The Ruler</p> <p>Topic 2. Perimeter and Area of Polygons Amount of Surface The Driveway... An Introduction to Area Area – Estimation Area of a Rectangle</p> <p>Topic 4. Solids... Volume and Surface Area Volume of a Solid The Concept</p>	*1. Using models, investigate and describe the measure of circumference of a circle as length.	<p>MAT+ <u>Understanding Measurement and Geometry</u> Topic 3. The Circle Circles All Around Us! Radius, Circumference, Diameter PI... A Special Number Introduction How do we Measure Circumference? Measuring Circles Summary Circumference of a Circle Circumference Example 1 – Egg Example 2 – The Well Example 3 – The Rolling Coin Example 4 – The Semi-Circle</p>
*2. Compare the size of a given angle with a right angle (<i>greater</i>)	<p>MAT+ <u>Understanding Measurement and</u></p>	*2. Investigate and compare angle measures using	<p>MAT+ <u>Understanding Measurement and</u></p>	2. Identify, describe, and draw right, acute, and obtuse angles.	<p>MAT+ <u>Understanding Measurement and</u></p>

<p><i>than, less than, or equal to</i>) and classify as obtuse, acute, or right.</p>	<p>Geometry Topic 5. Angles and their Measure Angles... An Introduction The Degree Classifying Angles Classifications Memory Game</p>	<p>models and manipulatives with angles of measure 45 degrees, 90 degrees, and 180 degrees.</p>	<p>Geometry Topic 5. Angles and their Measure Measuring Angles Practice Questions</p>		<p>Geometry Topic 5. Angles and their Measure Measuring Angles Practice Questions</p>
<p>*3. Develop strategies and determine perimeters of polygons.</p>	<p>MAT+ Understanding Measurement and Geometry Topic 2. Perimeter and Area of Polygons Walk Around a Polygon Joan Walks Length of the Metal Strip Find the Perimeter</p>	<p>*3. Using models, find the area of geometric shapes.</p>	<p>MAT+ Understanding Measurement and Geometry Topic 2. Perimeter and Area of Polygons Amount of Surface The Driveway... An Introduction to Area Area – Estimation Area of a Rectangle Concept Examples 1, 2 Area of a Parallelogram Concept Examples 1, 2</p>	<p>3. Using models, create examples of polygons with a given area and explain.</p>	<p>MAT+ Understanding Measurement and Geometry Topic 2. Perimeter and Area of Polygons Amount of Surface The Driveway... An Introduction to Area Area – Estimation Area of a Rectangle Concept Examples 1, 2 Area of a Parallelogram Concept Examples 1, 2</p>
<p>4. Select appropriate units of measurement—length, weight/mass, and time—and explain the basis for the selection.</p>	<p>NUM+ COMPARING AND ORDERING Skill – Describe Elapsed Time...Hours, 5 Minutes Level C Elapsed Time in Hours #1, #2 Elapsed Time – 5 Minutes #1, #2</p>	<p>4. Select units appropriate for the attributes being measured (length and area) and explain the basis for the selection</p>	<p>MAT+ Understanding Measurement and Geometry Topic 1. An Introduction to Measurement Benchmarks Establishing Benchmarks Meter Benchmarks Foot Benchmarks Centimeter Benchmarks</p>	<p>*4. Using models, create examples of right prisms with a given volume and explain.</p>	<p>MAT+ Understanding Measurement and Geometry Topic 4. Solids...Volume and Surface Area Volume of a Solid The Concept Volume of a Prism: Examples 1, 2</p>

			Inch Benchmarks Yard Benchmarks Our Benchmarks Using Benchmarks		
				5. Select units appropriate for the attributes being measured (length, area, and volume) and explain the basis for the selection.	MAT+ <u>Understanding Measurement and Geometry</u> Topic 1. An Introduction to Measurement Benchmarks Establishing Benchmarks Meter Benchmarks Foot Benchmarks Centimeter Benchmarks Inch Benchmarks Yard Benchmarks Our Benchmarks Using Benchmarks

EXPECTATION B. Understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems.

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. Explain the need for measuring with standard units.	<p><u>Understanding Measurement and Geometry</u> Topic 1. An Introduction to Measurement A Glimpse into the Past Metric and U.S.A Standard Measurement Systems Searching for the Standard Unit</p>				
*2. Use metric and U.S. customary units to measure length (inches, feet, yards, centimeters, and meters), liquid volume(cups, pints, quarts, gallons, and liters) ,temperature (degrees Fahrenheit, degrees Celsius), and weight/mass (ounces, pounds, grams, and kilograms).	<p>NUM+ <u>COMPARING AND ORDERING</u> Skill – Reading and Comparing Temperatures Level C Fahrenheit and Celsius Temperatures: Worksheets #1, #2 Compare Temperatures in a Day: Worksheets #1, #2</p> <p><u>Understanding Measurement and Geometry</u> Topic 1. An Introduction to Measurement Benchmarks Establishing</p>				

	Benchmarks Meter Benchmarks Foot Benchmarks Centimeter Benchmarks Inch Benchmarks Yard Benchmarks Our Benchmarks Using Benchmarks				
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EXPECTATION C. Carry out simple unit conversions, such as from centimeters to meters, within a system of measurement.

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. Convert units of measure within the metric system: length (centimeters, meters, kilometers), mass (grams, kilograms), and capacity (milliliters, liters); and within the customary system: length (inches, feet, yards), weight (ounces, pounds), and liquid volume (cups, pints, quarts, gallons).	<u>Understanding Measurement and Geometry</u> Topic 1. An Introduction to Measurement Converting Between Metric Units My Body Rudy's Run Practice Questions		
		2. Convert units of time including days, hours, minutes, and seconds.			

EXPECTATION D. Understand that measurements are approximations and understand how differences in units affect precision.

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. Describe factors that affect precision such as the limitations of the measuring tool, the scale on the measuring instrument, and the need for accuracy.	

EXPECTATION E. Explore what happens to measurements of a two-dimensional shape such as its perimeter and area when the shape is changed in some way.

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. Compare changes in area and changes in total perimeter when shapes are combined or subdivided.</p> <p>2. Construct models to demonstrate the effect of holding one variable constant while changing the value of another variable such as building rectangles with varying perimeters and constant areas.</p>	<p><u>Understanding Measurement and Geometry</u> Topic 2. Perimeter and Area of Polygons Relationship – Area and Perimeter The Information The Graph Given Area and Perimeter – Create Shape Example 1 Example 2 Example 3 Example 4</p> <p><u>Understanding Measurement and Geometry</u> Topic 9. Ratios for Areas and Volumes In This Topic Ratios for Areas and Volumes Introduction Area Ratios</p>

STANDARD II. Apply appropriate techniques, tools, and formulas to determine measurements.

EXPECTATION A. Develop strategies for estimating the perimeters, areas, and volumes of irregular 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. Develop and describe strategies for estimating the area and perimeter of irregular shapes using manipulatives (e.g., geoboards, square tiles, graphic representations).	<u>Understanding Measurement and Geometry</u> Topic 2. Perimeter and Area of Polygons Relationship – Area and Perimeter The Information The Graph Given Area and Perimeter – Create Shape Example 1 Example 2 Example 3 Example 4	1. Compare and evaluate different strategies for estimating area and perimeter of irregular shapes.	<u>Understanding Measurement and Geometry</u> Topic 2. Perimeter and Area of Polygons Relationship – Area and Perimeter The Information The Graph Given Area and Perimeter – Create Shape Example 1 Example 2 Example 3 Example 4
				2. Develop and describe strategies for estimating volumes of irregular shapes.	<u>Understanding Measurement and Geometry</u> Topic 4. Solids... Volume and Surface Area Volume of a Solid The Concept Volume of a Prism: Examples 1, 2

EXPECTATION B. Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.

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. Determine an appropriate measurement unit to measure time, length, weight, and volume (e.g., student chooses centimeters instead of meters to measure a pencil).	<p><u>Understanding Measurement and Geometry</u> Topic 1. An Introduction to Measurement Establishing Benchmarks Meter Benchmarks Foot Benchmarks Centimeter Benchmarks Inch Benchmarks Yard Benchmarks Our Benchmarks Using Benchmarks</p>	1. Estimate the distance to objects or places and determine the amounts of various units of time (minutes, hours, days, weeks, etc.) it will take to reach these objects or places.			
*2. Select and use an appropriate tool to measure time (minutes or larger), length (centimeters, meters, inches, feet, yards), mass/weight (grams, kilograms, ounces, pounds), and liquid volume (cups and fractional parts, liters and fractional parts).		*2. Select and use an appropriate tool to measure liquid volume including pints and quarts.		*1. Select and use appropriate tools and units to measure given items to an indicated precision (time in seconds through years; length in millimeters through kilometers, one-eighth of an inch through miles; liquid volume in milliliters through liters, ounces through gallons; mass/weight in milligrams through kilograms, ounces through pounds).	

		3. Determine the amount of elapsed time in hours and minutes within a twelve-hour period.	NUM+ <u>COMPARING AND ORDERING</u> Skill – Describe Elapsed Time...Hours, 5 Minutes Level C Elapsed Time in Hours #1, #2 Elapsed Time – 5 Minutes #1, #2	*2. Determine an amount of elapsed time in hours, minutes, and seconds within a 24-hour period.	
		*4. Using analog and digital clocks, tell time to the nearest minute and to the nearest five-minute interval, including use of A.M. and P.M.	NUM+ <u>COMPARING AND ORDERING</u> Level B/C Analog and Digital		
				*3. Using a protractor, measure angles between 0 and 180 degrees inclusive.	MAT+ <u>Understanding Measurement and Geometry</u> Topic 5. Angles and their Measure Measuring Angles
3. Read temperature to the nearest degree from a Celsius thermometer and from a Fahrenheit thermometer. 4. Estimate the conversion of Celsius and Fahrenheit units relative to familiar situations (water freezes at 0° C and 32° F, water boils at 100° C and 212° F, and normal body temperature is about 37° C and 98.6° F).	NUM+ <u>COMPARING AND ORDERING</u> Skill – Reading and Comparing Temperatures Level C Fahrenheit and Celsius Temperatures: Worksheets #1, #2	5. Determine temperature changes during time intervals from a Celsius thermometer and a Fahrenheit thermometer.			

EXPECTATION C. Select and use benchmarks to estimate measurements.

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. Develop a sense for measurement by using appropriate benchmarks (e.g., the distance from the elbow to the index finger is about a foot, a paper clip is about a gram).</p>	<p><u>Understanding Measurement and Geometry</u> Topic 1. An Introduction to Measurement Establishing Benchmarks Meter Benchmarks Foot Benchmarks Centimeter Benchmarks Inch Benchmarks Yard Benchmarks Our Benchmarks Using Benchmarks</p>				

EXPECTATION D. Develop, understand, and use formulas to find the area of rectangles and related triangles and parallelograms.

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. Use concrete and graphic models to find areas of common two-dimensional shapes.	MAT+ <u>Understanding Measurement and Geometry</u> Topic 2. Perimeter and Area of Polygons Area of a Rectangle Concept Examples 1, 2 Area of a Parallelogram Concept Area of a Triangle Concept Examples 1, 2	*1. Use concrete and graphic models to discover formulas for finding the area of common two-dimensional shapes.	MAT+ <u>Understanding Measurement and Geometry</u> Topic 2. Perimeter and Area of Polygons Area of a Rectangle Concept Examples 1, 2 Area of a Parallelogram Concept Area of a Triangle Concept Examples 1, 2	1. Investigate and solve problems involving area, using concrete, graphic or pictorial models to identify patterns and develop formulas for determining area. *2. Describe and determine the area of rectangles and related triangles and parallelograms.	MAT+ <u>Understanding Measurement and Geometry</u> Topic 2. Perimeter and Area of Polygons Relationship – Area and Perimeter The Information The Graph Given Area and Perimeter – Create Shape Example 1 Example 2 Example 3 Example 4 Problems Section Length of Fence Area of a Wall The Tablecloth Practice Questions

EXPECTATION E. Develop strategies to determine the surface areas and volumes of rectangular solids.

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, develop and describe strategies for determining the volume and surface area of rectangular solids.	MAT+ <u>Understanding Measurement and Geometry</u> Topic 4. Solids... Volume and Surface Area Surface Area of a Solid The Concept Surface Area of a Pyramid Volume of a Solid The Concept Volume of a Prism: Examples 1, 2