

CORRELATION
of
the 10 UNDERSTANDING MATH PLUS PROGRAMS
with
California State Board of Education ACADEMIC CONTENT STANDARDS
For Geometry

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

GEOMETRY

Grades 8 through 12

Mathematics Content Standards.

The geometry skills and concepts developed in this discipline are useful to all students. Aside from learning these skills and concepts, students will develop their ability to construct formal, logical arguments and proofs in geometric settings and problems.

Content Standard	Understanding Math PLUS computer assisted lessons
1.0 Students demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning.	

Content Standard	Understanding Math PLUS computer assisted lessons
2.0 Students write geometric proofs, including proofs by contradiction.	
3.0 Students construct and judge the validity of a logical argument and give counterexamples to disprove a statement.	MAT+ <u>Understanding Equations</u> Topic 5: Word Problems Words and Symbols The Translation Machine Examples 1,2,3,4 The Trick Machine Instructions The Machine Explanation with Picture; with Symbols Area of Walls Chemistry Pools Puzzler – The First Problem Perimeter Problem with Diagram Money Problem with Chart Age Problem with Chart Buying CDs Meat Mixture Coffee Mixture Rate of Work Summary: Problem Solving Using Equations
4.0 prove basic theorems involving congruence and similarity.	
5.0 Students prove that triangles are congruent or similar, and they are able to use the concept of corresponding parts of congruent triangles	
6.0 Students know and are able to use the triangle inequality theorem.	
7.0 Students prove and use theorems involving the	MAT+ <u>Understanding Measurement and Geometry</u>

<p>properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.</p>	<p>Topic 2: Perimeter and Area of Polygons Polygons...What Are They? Concept A Triangle is A Quadrilateral is</p> <p>Topic 3: The Circle In This Topic Circles All Around Us! Radius, Circumference, Diameter</p> <p>Topic 6: Angles and Polygons In This Topic Parallel Lines Example with Parallel Lines Examples 1,2</p>
<p>8.0 Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.</p> <p>9.0 Students compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres; and students commit to memory the formulas for prisms, pyramids, and cylinders.</p> <p>10.0 Students compute areas of polygons, including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.</p>	<p>MAT+ <u>Understanding Measurement and Geometry</u></p> <p>Topic 2: Perimeter and Area of Polygons Walk Around a Polygon Joan Walks Perimeter of Various Shapes Perimeter of the Ranch Length of the Metal Strip Find the Perimeter Amount of Surface The Driveway – An Introduction to Area Area – Estimation Area of a Rectangle Area of a Parallelogram Area of a triangle Relationship – Area and Perimeter Squares Rectangles Given Area and Perimeter – Create Shapes Examples 1, 2, 3, 4 Problems Section Length of Fence Area of a Wall The Tablecloth</p> <p>Topic 3: The Circle In This Topic 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 Area of a Circle Recall Area Area Exploration #1, #2 Example 1 – Wheel Example 2 – Pizza Example 3 – The Semi-circle</p>

	<p style="text-align: right;">Example 4 – The Dog’s Run Example 5 – The Hockey Rink Practice Questions; Topic Test</p> <p>Topic 4: Solids: Volume and Surface Area Classifying Solids A Solid is... Recall Polygons A Polyhedron is... A Prism is... Some Special Pyramids A Cylinder is... A Cone is... Platonic Solids Surface Area of a Solid The Concept Surface Area of a Pyramid Surface Area of a Cylinder Surface Area of a Sphere Volume of a Solid The Concept Volume of a Prism: Examples 1, 2 Volume of a Cylinder Volume of a Pyramid Volume of a Cone Volume of a Sphere Summary Practice Questions; Topic Test</p>
<p>11.0 Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids.</p>	<p>MAT+ <u>Understanding Measurement and Geometry</u> Topic 8 : Projective Geometry An Introduction Toothpicks on Isometric Dot Paper Toothpicks to Cube The Views Using Isometric Grid Paper Orthographic Projections: Introduction Given Volume – Build it Examples 1 through 6 Given Area – Build it Examples 1 through 6</p> <p>Topic 9: Ratios for Areas and Volumes In This Topic Ratios for Areas and Volumes Introduction Area Ratios Volume Ratios</p>
<p>12.0 Students find and use measures of sides and of interior and exterior angles of triangles and polygons to classify figures and solve problems.</p> <p>13.0 Students prove relationships between angles in polygons by using properties of complementary, supplementary, vertical, and exterior angles.</p>	<p>MAT+ <u>Understanding Measurement and Geometry</u> Topic 6: Angles and Polygons Angles in Triangles Exploration An Explanation Exterior Angles – Example Angles in Polygons Methods 1,2 Exterior Angles in a Polygon Practice Questions; Topic Test</p>
<p>14.0 Students prove the Pythagorean theorem.</p>	<p>MAT+ <u>Understanding Exponents</u> Topic 6: Pythagorean Theorem</p>

<p>15.0 Students use the Pythagorean theorem to determine distance and find missing lengths of sides of right triangles.</p>	<p>In This Topic The Right Triangle Math or Magic? Introduction Omar’s Rope Trick #1, #2 Our Rope Trick Squares on a Grid Examples 1-4 Squares on the Sides of a Right Triangle Triangles 1,2,3 The Pythagorean Theorem The Pattern In General Theorem</p>
<p>16.0 Students perform basic constructions with a straightedge and compass, such as angle bisectors, perpendicular bisectors, and the line parallel to a given line through a point off the line.</p>	<p>MAT+ <u>Understanding Measurement and Geometry</u> Topic 7: Constructions Before You Begin In This Topic Perpendicular Bisector Circumcircle Centroid Angle Bisector Incircle Perpendicular from Point on Line Perpendicular from Point off Line Orthocentre</p>
<p>17.0 Students prove theorems by using coordinate geometry, including the midpoint of a line segment, the distance formula, and various forms of equations of lines and circles.</p>	
<p>18.0 Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use elementary relationships between them. For example, $\tan(x) = \sin(x)/\cos(x)$, $(\sin(x))^2 + (\cos(x))^2 = 1$.</p>	
<p>19.0 Students use trigonometric functions to solve for an unknown length of a side of a right triangle, given an angle and a length of a side.</p>	
<p>20.0 Students know and are able to use angle and side relationships in problems with special right triangles, such as 30°, 60°, and 90° triangles and 45°, 45°, and 90° triangles.</p>	<p>MAT+ <u>Understanding Measurement and Geometry</u> Topic 6: Angles and Polygons Angles in Triangles Exploration An Explanation Exterior Angles – Example</p>
<p>21.0 Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.</p>	
<p>22.0 Students know the effect of rigid motions on figures in the coordinate plane and space, including rotations, translations, and reflections.</p>	<p>MAT+ <u>Understanding Graphing</u> Topic 4: Transformations Introduction to Common Transformations Translations – An Introduction</p>

	<p>Slides #1, #2, #3, #4</p> <p>Reflections – An Introduction</p> <p>Flips #1, #2, #3</p> <p>Rotations – An Introduction</p> <p>Turns #1, #2, #3, #4, #5</p> <p>The Transformation Machine</p> <p>Examples 1, 2, 3, 4, 5</p> <p>Translations</p> <p>Object to Image</p> <p>We Say, We Write</p> <p>Translation Mapping Rule</p> <p>Examples</p> <p>Reflections</p> <p>Object to Image</p> <p>We Say, We Write</p> <p>Reflection Mapping Rule</p> <p>Examples</p> <p>Rotations</p> <p>Object to Image</p> <p>We Say, We Write</p> <p>Rotation Mapping Rule</p> <p>Examples</p>
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