

<p style="text-align: center;">Georgia Department of Education: Georgia Mathematics Performance Standards Fourth Grade</p>

**Correlations of the TEN UNDERSTANDING MATHEMATICS PLUS Programs
By Neufeld Learning Systems Inc.
April 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
- ..a topic test with random questions and tracking
- ..off computer worksheets selected from the website .. www.neufeldmath.com

By the end of grade four, students will add and subtract decimal fractions and common fractions with common denominators. They will also understand how and when it is appropriate to use rounding. Students will use common measurement units to determine weight. Students will develop their understanding of measuring angles with appropriate units and tools. Students will understand the characteristics of geometric plane and solid figures. They will also use tables, graphs, and charts to record and analyze data.

M4N. Number and Operations

Students will further develop their understanding of whole numbers and master the four basic operations with whole numbers by solving problems. They will also understand rounding and when to appropriately use it. Students will add and subtract decimal fractions and common fractions with common denominators.

M4N1. Students will further develop their understanding of how whole numbers are represented in the base-ten numeration system.

- a. Identify place value names and places from hundredths through one million.

Understanding Math PLUS - Understanding Whole Numbers and Integers

Topic 1 - The Meaning of Whole Numbers CAN / US

Place Value to 999 999

Examples 1 through 5

The Number Line

Examples 1, 2

Millions

Examples 1 through 4

- b. Equate a number's word name, its standard form, and its expanded form.

Understanding Math PLUS - 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

Represent Numbers in Many Ways

Examples 1 through 5

M4N2. Students will understand and apply the concept of rounding numbers.

- a. Round numbers to the nearest ten, hundred, or thousand.
- b. Describe situations in which rounding numbers would be appropriate and determine whether to round to the nearest ten, hundred, or thousand.

Understanding Math PLUS – Understanding Whole Numbers and Integers

Topic 1 - The Meaning of Whole Numbers CAN / US

Rounding Large Numbers

Examples 1 through 5

- c. Understand the meaning of rounding a decimal fraction to the nearest whole number.
- d. Represent the results of computation as a rounded number when appropriate and estimate a sum or difference by rounding numbers.

Understanding Math PLUS – Understanding Fractions

Topic 15 – Fractions and Decimals

Rounding

Examples 1, 2

M4N3. Students will solve problems involving multiplication of 2-3 digit numbers by 1-2 digit numbers.

M4N4. Students will further develop their understanding of division of whole numbers and divide in problem solving situations without calculators.

- a. Know the division facts with understanding and fluency.
- b. Solve problems involving division by a 2-digit number (including those that generate a remainder).
- c. Understand the relationship between dividend, divisor, quotient, and remainder.
- d. Understand and explain the effect on the quotient of multiplying or dividing both the divisor and dividend by the same number. ($2050 \div 50$ yields the same answer as $205 \div 5$).

Understanding Math PLUS – Understanding Whole Numbers and Integers

Topic 3 – Multiplying and Dividing Whole Numbers

Divide by a Single Digit Divisor : Fair Sharing

Fair Sharing – Example 1 With Blocks

Fair Sharing – Example 2 Without Blocks

Fair Sharing – Questions 1 through 6

M4N5. Students will further develop their understanding of the meaning of decimal fractions and use them in computations.

- a. Understand decimal fractions are a part of the base-ten system.
- b. Understand the relative size of numbers and order two digit decimal fractions.
- c. Add and subtract both one and two digit decimal fractions.
- d. Model multiplication and division of decimal fractions by whole numbers.
- e. Multiply and divide both one and two digit decimal fractions by whole numbers.

M4N6. Students will further develop their understanding of the meaning of common fractions and use them in computations.

- a. Understand representations of simple equivalent fractions.

Understanding Math PLUS – Understanding Fractions

Topic 3 – Equivalent Fractions

Introduction

Square

Triangle

Pattern Blocks

Hexagon: 1, 2

Fraction Strips

Concepts: 1, 2

The Clock

Introduction : 1, 2

Examples

Equivalent Fractions on a Number Line

Comparison of Fractions

Equivalent Fractions in a Multiplication Table

- b. Add and subtract fractions and mixed numbers with common denominators.
(Denominators should not exceed twelve.)
- c. Convert and use mixed numbers and improper fractions interchangeably.

Understanding Math PLUS – Understanding Fractions

Topic 13 – Improper Fractions and Mixed Numbers

The Concept

Packages

Clock

Improper Fractions and Mixed Numbers...What are they?

Introductory Problem

Method 1 – Examples 1, 2

Method 2 – Examples 1, 2

Improper to Mixed

Examples 1, 2

Practice Questions

Adding Mixed Numbers

M4N7. Students will explain and use properties of the four arithmetic operations

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Source: Georgia Mathematics Performance Standards : Georgia Department of Education :

<http://www.georgiastandards.org/math.asp>

to solve and check problems.

- a. Describe situations in which the four operations may be used and the relationships among them.

Understanding Math PLUS – Understanding Whole Numbers and Integers

Topic 2 – Adding and Subtracting Whole Numbers

Topic 3 – Multiplying and Dividing Whole Numbers

All SECTIONS

- b. Compute using the order of operations, including parentheses.

Understanding Math PLUS – Understanding Whole Numbers and Integers

Topic 9 – 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

Example Questions

Examples 1 through 10

- c. Compute using the commutative, associative, and distributive properties.
d. Use mental math and estimation strategies to compute.

Understanding Math PLUS – Understanding Whole Numbers and Integers

Topic 3 – Multiplying and Dividing Whole Numbers

Commutative Property

$$5 \times 1 = 1 \times 5$$

$$5 \times 2 = 2 \times 5$$

$$5 \times 3 = 3 \times 5$$

$$4 \times 3 = 3 \times 4$$

Associative Property

Examples 1, 2

Distributive Method

Distributive Method – Examples 1, 2, 3

Distributive Method – Questions 1, 2, 3

M4M. Measurement

Students will measure weight in appropriate metric and standard units. They will also measure angles.

M4M1. Students will understand the concept of weight and how to measure it.

- a. Use standard and metric units to measure the weight of objects.
- b. Know units used to measure weight (gram, kilogram, ounces, pounds and tons).
- c. Compare one unit to another within a single system of measurement.

Understanding Math PLUS – Understanding Measurement and Geometry

Topic 1 – An Introduction to Measurement

Measurement in the News

Metric and U.S.A. Standard Measurement Systems

Searching for the Standard Unit

Related Units from Metric Prefixes

Metric Prefixes at Work

Converting between Metric Prefixes

The Ruler

M4M2. Students will understand the concept of angles and how to measure it.

- a. Use tools, such as a protractor or angle ruler, and other methods such as paper folding, drawing a diagonal in a square, to measure angles.
- b. Understand the meaning and measure of a half rotation (180°) and a full rotation (360°).

Understanding Math PLUS – Understanding Measurement and Geometry

Topic 5 – Angles and Their Measure

Lines and Rays

Angles...An Introduction

The Degree

Classifying Angles

Classifications

Memory Game

M4G. Geometry

Students will understand and construct plane and solid geometric figures. They will also graph points on the coordinate plane.

M4G1. Students will define and identify the characteristics of geometric figures through examination and construction.

- a. Examine and compare angles in order to classify and identify triangles by their angles.

Understanding Math PLUS – Understanding Measurement and Geometry

Topic 5 – Angles and Their Measure

Angles...An Introduction

The Degree

Classifying Angles

Classifications

Memory Game

- b. Describe parallel and perpendicular lines in plane geometric figures.

Understanding Math PLUS – Understanding Measurement and Geometry

Topic 6 – Angles and Polygons

In this Topic

Parallel Lines

Example with Parallel Lines

Examples 1, 2

- c. Examine and classify quadrilaterals (including parallelograms, squares, rectangles, trapezoids, and rhombi).
d. Compare and contrast the relationships among quadrilaterals.

Understanding Math PLUS – Understanding Measurement and Geometry

Topic 2 – Perimeter and Area of Polygons

In This Topic

Polygons...What are they?

Concept

A Triangle is

A Quadrilateral is

A Pentagon is

A Hexagon is

An Octagon is

Classify Polygons

Understanding Math PLUS – 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

M4G2. Students will understand fundamental solid figures.

- a. Compare and contrast a cube and a rectangular prism in terms of the number and shape of their faces, edges, and vertices.
- b. Describe parallel and perpendicular lines and planes in connection with the rectangular prism.
- c. Construct/collect models for solid geometric figures (cube, prisms, cylinder, etc.).

Understanding Math PLUS – Understanding Measurement and Geometry

Topic 4 – Solids...Volume and Surface Area

In this Topic

Classifying Solids

A Solid is...

Recall Polygons

M4G3. Students will use the coordinate system.

- a. Understand and apply ordered pairs in the first quadrant of the coordinate system.
- b. Locate a point in the first quadrant in the coordinate plane and name the ordered pair.
- c. Graph ordered pairs in the first quadrant.

M4A. Algebra

Students will investigate and represent mathematical relationships between quantities using mathematical expressions in problem-solving situations.

M4A1. Students will represent and interpret mathematical relationships in quantitative expressions.

- a. Understand and apply patterns and rules to describe relationships and solve problems.
- b. Represent unknowns using symbols, such as x and y .
- c. Write and evaluate mathematical expressions using symbols and different values.

M4D. Data Analysis

Students will gather, organize, and display data. They will also compare features of graphs.

M4D1. Students will gather, organize, and display data according to the situation and compare related features.

- a. Represent data in bar, line and pictographs.
- b. Investigate the features and tendencies of graphs.
- c. Compare different graphical representations for a given set of data.
- d. Identify missing information and duplications in data.

Understanding Math PLUS – Understanding Graphing

Topic 1 – Reading and Sketching Graphs

In This Topic

Graphs Without a Scale

Concept – Age and Weight

Examples 1 through 10

Graphs With a Scale

Concept – Distance and Time

Examples 1 through 14

Topic 2 – Statistics

In This Topic

An Introduction

Tally Chart

Pictograph: #1, #2

Bar Graph: #1, #2

Line Graph: #1, #2

M4P. Process Skills

Students will apply mathematical concepts and skills in the context of authentic problems and will understand concepts rather than merely following a sequence of procedures.

Students will use the process standards as a way of acquiring and using content knowledge.

M4P1. Using the appropriate technology, students will solve problems that arise in mathematics and in other contexts.

- a. Solve non-routine word problems using the strategies of work backwards, use or make a table, and make an organized list as well as all strategies learned in previous grades.
- b. Solve single and multi-step routine word problems related to all appropriate fourth grade math standards.
- c. Determine the operation(s) needed to solve a problem.
- d. Determine the most efficient way to solve a problem (mentally, paper/pencil, or calculator).

M4P2. Students will investigate, develop, and evaluate mathematical arguments.

M4P3. Students will use the language of mathematics to express ideas precisely.

M4P4. Students will understand how mathematical ideas interconnect and build on one another and apply mathematics in other content areas.

M4P5. Students will create and use pictures, manipulatives, models, and symbols to organize, record, and communicate mathematical ideas.

Understanding Math PLUS...All Programs...All Sections

Terms / Symbols:

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Source: Georgia Mathematics Performance Standards : Georgia Department of Education :

<http://www.georgiastandards.org/math.asp>

sum, difference, product, quotient, mixed fraction, proper fraction, improper fraction,
point, ray, line, line segment, parallel, perpendicular, diagonal line, plane, weight, ounce,
pound, ton, gram, kilogram, protractor, degree, rotation, parallelogram, trapezoid,
rhombus, quadrilateral, congruent, cube, rectangular prism, coordinate system, ordered
pair, ratio, proportion, variable, line graph, pictograph