

**CORRELATION  
of  
the Understanding Numeration PLUS & Understanding Math PLUS programs  
with  
MICHIGAN CONTENT STANDARDS  
Grade 8  
APRIL 2007**

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

**The 10 programs are:**

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|--|--|
| 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
<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 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](http://www.neufeldmath.com)

## Number and Operations

### Understand real number concepts

MICHIGAN CONTENT STANDARDS	UNDERSTANDING NUMERATION PLUS LESSONS
<p><b>N.ME.08.01</b> Understand the meaning of a square root of a number and its connection to the square whose area is the number; understand the meaning of a cube root and its connection to the volume of a cube.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Exponents</u></b>  <b>Topic 5. Square Roots</b>            Square Roots            Radical Signs            Square Roots of Negative Numbers            Example Questions                1. Radicals First                2. The Four Equations                3. Lawn Question                4. Make a Square            Practice Questions            Topic Test</p>
<p><b>N.ME.08.02</b> Understand meanings for zero and negative integer exponents.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Exponents</u></b>  <b>Topic 3. The Exponent Rules</b>            A Power with Exponent 0            Explanation with <math>b</math>; Explanation with <math>a</math>            Summary            A Power with a NEGATIVE Exponent            Method 1: Explanation with <math>b</math>            Method 2: Explanation with <math>k</math>            Method 3: Bacteria Doubling            Summary</p>
<p><b>N.ME.08.03</b> Understand that in decimal form, rational numbers either terminate or eventually repeat, and that calculators truncate or round repeating decimals; locate rational numbers on the number line; know fraction forms of common repeating decimals, e.g., <math>0.1 = \frac{1}{9}</math> ; <math>0.3 = \frac{1}{3}</math> .</p>	<p><b><u>Understanding Math PLUS</u></b>  <b>Topic 6. Percents...Fractions...Decimals</b>            Expressing a Decimal as a Percent            Examples 1, 2, 3            Summary and Pattern            % Nitrogen in the Air</p>

	Batting Averages Expressing a Fraction as a Percent An Example Method 1 Examples 1, 2 Method 2 Examples 1, 2 Lightning Example Number Line #2 Chart
<b>N.ME.08.04</b> Understand that irrational numbers are those that cannot be expressed as the quotient of two integers, and cannot be represented by terminating or repeating decimals; approximate the position of familiar irrational numbers, e.g., $\sqrt{2}$ , $\sqrt{3}$ , $\pi$ , on the number line.	
<b>N.FL.08.05</b> Estimate and solve problems with square roots and cube roots using calculators.	<b><u>Understanding Math PLUS</u></b> <b><u>Understanding Exponents</u></b> <b>Topic 5. Square Roots</b> Example Questions <ol style="list-style-type: none"> <li>1. Radicals First</li> <li>2. The Four Equations</li> <li>3. Lawn Question</li> <li>4. Make a Square</li> </ol> Practice Questions
<b>N.FL.08.06</b> Find square roots of perfect squares and approximate the square roots of non-perfect squares by locating between consecutive integers, e.g., $\sqrt{130}$ is between 11 and 12.	

**Solve problems**

MICHIGAN CONTENT STANDARDS	UNDERSTANDING NUMERATION PLUS LESSONS
<p><b>N.MR.08.07</b> Understand percent increase and percent decrease in both sum and product form, e.g., 3% increase of a quantity <math>x</math> is <math>x + .03x = 1.03x</math>.</p> <p><b>N.MR.08.08</b> Solve problems involving percent increases and decreases.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Percent</u></b>  <b>Topic 6. Problems Involving Percent</b>                      Percent Change                      Interest                      Tree Problem                      Percent Markup</p>
<p><b>N.FL.08.09</b> Solve problems involving compounded interest or multiple discounts.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Percent</u></b>  <b>Topic 7. Percent in Business</b>                      Discount                      Football Sale                      What Can I Afford?                      Which is Cheaper?                      Competitor's Discount                      Compound Interest                      What is it?                      Complete the Table?                      Formula                      Spreadsheet                      Interest Calculator                      Bank Interest</p>
<p><b>N.MR.08.10</b> Calculate weighted averages such as course grades, consumer price indices, and sports ratings.</p>	
<p><b>N.FL.08.11</b> Solve problems involving ratio units, such as miles per hour, dollars per pound, or persons per square mile.*</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Percent</u></b>  <b>Topic 4. Ratios and Proportions</b>                      Ratios in the News                      What is a Ratio?                      Examples                      1. Fraction Strip</p>

	<p>2.Balls 3.Students 4.Gears</p> <p>Writing Ratios Concept Examples 1, 2, 3, 4</p>
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## Algebra

### Understand the concept of non-linear functions using basic examples

MICHIGAN CONTENT STANDARDS	UNDERSTANDING NUMERATION PLUS LESSONS
<p><b>A.RP.08.01</b> Identify and represent linear functions, quadratic functions, and other simple functions including inversely proportional relationships (<math>y = k/x</math>); cubics (<math>y = ax^3</math>); roots (<math>y = \sqrt{x}</math>); and exponentials (<math>y = ax^a</math>, <math>a &gt; 0</math>); using tables, graphs, and equations.*</p> <p><b>A.PA.08.02</b> For basic functions, e.g., simple quadratics, direct and indirect variation, and population growth, describe how changes in one variable affect the others.</p>	<p><b><u>Understanding Math PLUS</u></b> <b><u>Understanding Graphing</u></b> <b>Topic 9. Quadratic Functions</b> Introductory Examples Examples 1, 2 Summary Examples 1, 2 Definitions Parabolas Quadratic Functions The Role of <math>a</math> The Plan: <math>a = 1, 2, 3</math> <math>a = -1, -2, -3</math> Parabolas with the Same Width Summary The Role of <math>c</math> The Plan: Increase <math>c</math> Summary The Role of <math>b</math> Examples 1, 2, 3, 4 Summary and Pattern In General</p>

**A.PA.08.03** Recognize basic functions in problem context, e.g., area of a circle is  $\pi r^2$ , volume of a sphere is  $\frac{4}{3} \pi r^3$ , and represent them using tables, graphs, and formulas.

## **Understanding Math PLUS**

### **Understanding Measurement and Geometry**

#### **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

Area Exploration #2

Example 1 – Wheel

Example 2 – Pizza

Example 3 – The Semi-Circle

Example 4 – The Dog's Run

Example 5 – The Hockey Rink

#### **Topic 4. Solids...Volume and Surface Area**

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

<p><b>A.RP.08.04</b> Use the vertical line test to determine if a graph represents a function in one variable.</p>	<p><b>Understanding Math PLUS</b>  <b>Understanding Graphing</b>  <b>Topic 5. Equations, Relations, and Functions</b>  Vertical Line Test  Examples 1, 2, 3</p>
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**Understand and represent quadratic functions**

<b>MICHIGAN CONTENT STANDARDS</b>	<b>UNDERSTANDING NUMERATION PLUS LESSONS</b>
<p><b>A.RP.08.05</b> Relate quadratic functions in factored form and vertex form to their graphs, and vice versa; in particular, note that solutions of a quadratic equation are the x-intercepts of the corresponding quadratic function.</p> <p><b>A.RP.08.06</b> Graph factorable quadratic functions, finding where the graph intersects the x-axis and the coordinates of the vertex; use words “parabola” and “roots”; include functions in vertex form and those with leading coefficient <math>-1</math>, e.g., <math>y = x^2 - 36</math>, <math>y = (x - 2)^2 - 9</math>; <math>y = -x^2</math>;  <math>y = -(x - 3)^2</math>.</p>	<p><b>Understanding Math PLUS</b>  <b>Understanding Graphing</b>  <b>Topic 9. Quadratic Functions</b>  Introductory Examples  Examples 1, 2  Summary Examples 1, 2  Definitions  Parabolas  Quadratic Functions  The Role of <math>a</math>  The Plan: <math>a = 1, 2, 3</math>  <math>a = -1, -2, -3</math>  Parabolas with the Same Width  Summary  The Role of <math>c</math>  The Plan: Increase <math>c</math>  Summary  The Role of <math>b</math>  Examples 1, 2, 3, 4  Summary and Pattern  In General</p>

**Recognize, represent, and apply common formulas**

MICHIGAN CONTENT STANDARDS	UNDERSTANDING NUMERATION PLUS LESSONS
<p><b>A.FO.08.07</b> Recognize and apply the common formulas:  <math>(a + b)^2 = a^2 + 2 ab + b^2</math>  <math>(a - b)^2 = a^2 - 2 ab + b^2</math>  <math>(a + b)(a - b) = a^2 - b^2</math> ; represent geometrically.</p> <p><b>A.FO.08.08</b> Factor simple quadratic expressions with integer coefficients, e.g., <math>x^2 + 6x + 9</math>, <math>x^2 + 2x - 3</math>, and <math>x^2 - 4</math>; solve simple quadratic equations, e.g., <math>x^2 = 16</math> or <math>x^2 = 5</math> (by taking square roots); <math>x^2 - x - 6 = 0</math>, <math>x^2 - 2x = 15</math> (by factoring); verify solutions by evaluation.</p> <p><b>A.FO.08.09</b> Solve applied problems involving simple quadratic equations.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Graphing</u></b>  <b>Topic 9. Quadratic Functions</b>                      Intercepts of a Quadratic Function                      Method 1: Graphing... Examples 1, 2                      Method 2: Factoring (If Possible)... Examples 1, 2                      Method 3: Using the Quadratic Formula... Examples 1, 2                      Maximize Cage Area                      Trial and Error                      Use Quadratic Function                      Graph                      Conclusions                      Summary                      Maximize Potato Income                      Trial and Error                      Quadratic Function                      Graph                      Summary</p>

**Understand solutions and solve equations, simultaneous equations, and linear inequalities**

MICHIGAN CONTENT STANDARDS	UNDERSTANDING NUMERATION PLUS LESSONS
<p><b>A.FO.08.10</b> Understand that to solve the equation <math>f(x) = g(x)</math> means to find all values of <math>x</math> for which the equation is true, e.g., determine whether a given value, or values from a given set, is a solution of an equation (0 is a solution of <math>3x^2 + 2 = 4x + 2</math>, but 1 is not a solution).</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Graphing</u></b>  <b>Topic 9. Quadratic Functions</b>                      Intercepts of a Quadratic Function                      Method 1: Graphing... Examples 1, 2                      Method 2: Factoring (If Possible)... Examples 1, 2                      Method 3: Using the Quadratic Formula... Examples 1, 2</p>

<p><b>A.FO.08.11</b> Solve simultaneous linear equations in two variables by graphing, by substitution, and by linear combination; estimate solutions using graphs; include examples with no solutions and infinitely many solutions.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Graphing</u></b>  <b>Topic 8. Equation of a Straight Line</b>  Slope – Point Form of the Equation  Example 1: Solutions 1, 2  Example 2: Solutions 1, 2, 3, 4  Special Cases  Example 1 – Zero Slope  Example 2 – Undefined  Example to Summarize  Word Problems/ Applications  The Taxi  Cases 1, 2  Find Equation  Graph Equation  Interpret Equation  Summary  The Walker  Basketball  Food</p>
<p><b>A.FO.08.12</b> Solve linear inequalities in one and two variables, and graph the solution sets.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Equations</u></b>  <b>Topic 6. Solving Linear Systems</b>  In This Topic  The Meaning of a Linear System  The Meaning of Solving a Linear System  Solve a Linear System by Graphing  Examples 1, 2 – Intersecting Lines  Examples 3, 4 – Intersecting Lines Involving Fractions  Example 5 – Parallel Lines  Example 6 – Coincidental Lines  Solve a Linear System by Substitution  Examples 1, 2 – Intersecting Lines  Examples 3, 4 – Intersecting Lines Involving Fractions  Example 5 – Parallel Lines</p>

	<p>Example 6 – Coincidental Lines  Solve a Linear System by Elimination  Examples 1, 2 – Intersecting Lines  Examples 3, 4 – Intersecting Lines Involving Fractions</p>
<p><b>A.FO.08.13</b> Set up and solve applied problems involving simultaneous linear equations and linear inequalities.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Equations</u></b>  <b>Topic 7. Solving Inequalities</b>  Comparing Integers  The Integer Line  Example 1... Greater Than; Example 2... Less Than  Explanation  Example 3... Greater Than; Example 4... Less Than  Greater Than or Less Than  Inequalities  What Are They?  Inequality vs. Equation  Summary of Relationships  Inequality on the Number Line  Examples 1, 2, 3, 4  Solving Inequalities  Examples 1, 2, 3, 4, 5, 6  Solving Compound Inequalities  Examples 1, 2  Graphing Linear Inequalities in Two Variables  Concepts 1, 2  Examples 1, 2, 3  Solving Systems of Linear Inequalities by Graphing  Examples 1, 2</p>

## Geometry

### Understand and use the Pythagorean Theorem

MICHIGAN CONTENT STANDARDS	UNDERSTANDING NUMERATION PLUS LESSONS
<p><b>G.GS.08.01</b> Understand at least one proof of the Pythagorean Theorem; use the Pythagorean Theorem and its converse to solve applied problems including perimeter, area, and volume problems.</p> <p><b>G.LO.08.02</b> Find the distance between two points on the coordinate plane using the distance formula; recognize that the distance formula is an application of the Pythagorean Theorem.</p>	<p><b><u>Understanding Math PLUS</u></b> <b><u>Understanding Exponents</u></b> <b>Topic 6. Pythagorean Theorem</b> 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, 2, 3, 4 Squares on the Sides of a Right Triangle Triangles 1, 2, 3 The Pythagorean Theorem The Pattern In General Theorem Example Questions 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, 2, 3, 4 Squares on the Sides of a Right Triangle Triangles 1, 2, 3 The Pythagorean Theorem The Pattern In General Theorem Example Questions</p>

**Solve problems about geometric figures**

MICHIGAN CONTENT STANDARDS	UNDERSTANDING NUMERATION PLUS LESSONS
<p><b>G.SR.08.03</b> Understand the definition of a circle; know and use the formulas for circumference and area of a circle to solve problems.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Measurement and Geometry</u></b>  <b>Topic 3. The Circle</b>            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            Area Exploration #2            Example 1 – Wheel            Example 2 – Pizza            Example 3 – The Semi-Circle            Example 4 – The Dog’s Run            Example 5 – The Hockey Rink</p>
<p><b>G.SR.08.04</b> Find area and perimeter of complex figures by subdividing them into basic shapes (quadrilaterals, triangles, circles).</p> <p><b>G.SR.08.05</b> Solve applied problems involving areas of triangles, quadrilaterals, and circles.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Measurement and Geometry</u></b>  <b>Topic 2. Perimeter and Area of Polygons</b>            Relationship – Area and Perimeter            The Information</p>

	<p>The Graph</p> <p>Given Area and Perimeter – Create Shape</p> <p>Example 1</p> <p>Example 2</p> <p>Example 3</p> <p>Example 4</p> <p>Problems Section</p> <p>Length of Fence</p> <p>Area of a Wall</p> <p>The Tablecloth</p>
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**Understand concepts of volume and surface area, and apply formulas**

<b>MICHIGAN CONTENT STANDARDS</b>	<b>UNDERSTANDING NUMERATION PLUS LESSONS</b>
<p><b>G.SR.08.06</b> Know the volume formulas for generalized cylinders ((area of base) x height), generalized cones and pyramids ( <math>\frac{1}{3}</math> (area of base) x height), and spheres ( <math>\frac{4}{3} \pi</math> (radius)<sup>3</sup> ) and apply them to solve problems.</p>	<p><b><u>Understanding Math PLUS</u></b></p> <p><b><u>Understanding Measurement and Geometry</u></b></p> <p><b>Topic 4. Solids...Volume and Surface Area</b></p> <p>Volume of a Solid</p> <p>The Concept</p> <p>Volume of a Prism: Examples 1, 2</p> <p>Volume of a Cylinder</p> <p>Volume of a Pyramid</p> <p>Volume of a Cone</p> <p>Volume of a Sphere</p> <p>Summary</p> <p>Practice Questions</p>
<p><b>G.SR.08.07</b> Understand the concept of surface area, and find the surface area of prisms, cones, spheres, pyramids, and cylinders.</p>	<p><b><u>Understanding Math PLUS</u></b></p> <p><b><u>Understanding Measurement and Geometry</u></b></p> <p><b>Topic 4. Solids...Volume and Surface Area</b></p> <p>Surface Area of a Solid</p> <p>The Concept</p>

Surface Area of a Pyramid  
 Surface Area of a Cylinder  
 Surface Area of a Sphere

**Visualize solids**

MICHIGAN CONTENT STANDARDS	UNDERSTANDING NUMERATION PLUS LESSONS
<p><b>G.SR.08.08</b> Sketch a variety of two-dimensional representations of three-dimensional solids including orthogonal views (top, front, and side), picture views (projective or isometric), and nets; use such two-dimensional representations to help solve problems.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Measurement and Geometry</u></b>  <b>Topic 2. Perimeter and Area of Polygons</b>            Concept            A Triangle is            A Quadrilateral is            A Pentagon is            A Hexagon is            An Octagon is            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>

**Understand and apply concepts of transformation and symmetry**

MICHIGAN CONTENT STANDARDS	UNDERSTANDING NUMERATION PLUS LESSONS
<p><b>G.TR.08.09</b> Understand the definition of a dilation from a point in the plane, and relate it to the definition of similar polygons.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Graphing</u></b>  <b>Topic 4. Transformations</b>            Dilatations            Object to Image            We Say            We Write            Dilatation Mapping Rule            Examples            Examples 1, 2</p>
<p><b>G.TR.08.10</b> Understand and use reflective and rotational symmetries of two-dimensional shapes and relate them to transformations to solve problems.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Graphing</u></b>  <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>

## Data and Probability

### Draw, explain, and justify conclusions based on data

MICHIGAN CONTENT STANDARDS	UNDERSTANDING NUMERATION PLUS LESSONS
<p><b>D.AN.08.01</b> Determine which measure of central tendency (mean, median, mode) best represents a data set, e.g., salaries, home prices, for answering certain questions; justify the choice made.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Graphing</u></b>  <b>Topic 2. Statistics</b>            Measures of Central Tendency            Introduction            The Mean Average            The Median average            The Mode            Summary            Another Example            Adding Data Points</p>
<p><b>D.AN.08.02</b> Recognize practices of collecting and displaying data that may bias the presentation or analysis.</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Graphing</u></b>  <b>Topic 2. Statistics</b> Statistics... What is it?            Collecting Data            Throw a Die            Throw 2 Dice            Voting            Primary Data - Gathering Methods            Secondary Data - Gathering Methods</p>

**Understand probability concepts for simple and compound events**

MICHIGAN CONTENT STANDARDS	UNDERSTANDING NUMERATION PLUS LESSONS
<p><b>D.PR.08.03</b> Compute relative frequencies from a table of experimental results for a repeated event. Interpret the results using relationship of probability to relative frequency.*</p>	<p><b><u>Understanding Math PLUS</u></b>  <b><u>Understanding Probability</u></b>  <b>Topic 1. Introduction to Probability</b>                      Tree Diagrams                      Coin &amp; Die                      Meals                      Socks                      Rabbits                      Forest                      Practice Questions</p> <p><b>Topic 2. What's the Chance?</b>                      Probability                      What is it?                      Introduction 1                      Introduction 2                      Probability Examples</p> <ol style="list-style-type: none"> <li>1. Coin Toss</li> <li>2. Picking One Ball</li> <li>3. Picking Two Balls</li> <li>4. Travel Example</li> <li>5. Number Example</li> <li>6. Rabbit Example</li> <li>7. Mailing Letters</li> <li>8. Forest</li> <li>9. Ahmed's Maze</li> </ol> <p>The Probability Scale                      Examples                      Summary                      Follow Up                      Soccer Example                      Experimental Probability                      Introduction                      Examples 1, 2                      Practice Questions</p>

**D.PR.08.04** Apply the Basic Counting Principle to find total number of outcomes possible for independent and dependent events, and calculate the probabilities using organized lists or tree diagrams.

**D.PR.08.05** Find and/or compare the theoretical probability, the experimental probability, and/or the relative frequency of a given event.\*

**D.PR.08.06** Understand the difference between independent and dependent events, and recognize common misconceptions involving probability, e.g., Alice rolls a 6 on a die three times in a row; she is just as likely to roll a 6 on the fourth roll as she was on any previous roll.

## **Understanding Math PLUS**

### **Understanding Probability**

#### **Topic 3. Dice Probabilities**

Roll One Die

Your Experiment

Computer's Experiment

Theoretical Experiment

Patterns

Summary

Roll Two Dice

Your Experiment

Computer's Experiment

Theoretical Experiment

Patterns

Summary

Practice Questions

#### **Topic 7. Independent Events**

In This Topic

What Are They?

Examples

1. Toss Two Coins

2. Replacing Marbles

Probability

1. Coin and Die

2. Balls

3. Letter Tiles

Patterns and Summary

1. Summary

2. Spinner

3. Cards

Practice Questions

Topic Test

## **Topic 8. Dependent**

In This Topic

What Are They?

Independent Events

Dependent Events

Examples

1. Keep the First Marble
2. Choose the Flowers

Probability

1. Keep the First Ball
2. Keep the First Tile
3. Plant the First Flower

Patterns and Summary

1. Summary
2. Money
3. Socks
4. Names

Practice Questions