



**Correlation of the Understanding Math 2008© Programs
With the Texas Essential Knowledge and Skills For Mathematics
8th Grade**

The programs are designed for use in a variety of teaching and learning environments ranging from a teacher-centered approach with one computer to a student-centered lab approach. The lessons may also be used in remediation, tutorials, intervention, resource, and fast-tracking.

Organization of the Understanding Math 2008© Programs

The Understanding Math 2008© series of programs consists of the following nine programs written for fourth to tenth grade:

Understanding Whole Numbers and Integers
Understanding Measurement and Geometry
Understanding Fractions
Understanding Graphing
Understanding Percent

Understanding Equations
Understanding Probability
Understanding Algebra
Understanding Exponents

Each program contains several sections with several topics. Every topic has the following:

- 1) an interactive concept introduction, usually with a variety of graphic approaches;
- 2) a number of particular examples;
- 3) practice questions with random questions, but specific feedback;
- 4) a topic test with random questions and tracking;
- 5) on-line worksheets selected from our website (www.neufeldmath.com).

Teachers may also search for specific topics using our search engine at <http://www.corr.neufeldmath.com>.



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The TEKS have been correlated to the Understanding Math 2008© programs. The location is listed below:

Number, operation, and quantitative reasoning

- | | |
|---|---------------|
| (1) The student understands that different forms of numbers are appropriate for different situations. | Pages 3 - 14 |
| (2) The student selects and uses appropriate operations to solve problems and justify solutions. | Pages 14 - 20 |

Patterns, relationships, and algebraic thinking

- | | |
|---|---------------|
| (3) The student identifies proportional or non-proportional linear relationships in problem situations and solves problems. | Pages 21 - 24 |
| (4) The student makes connections among various representations of a numerical relationship. | Pages 25 - 25 |
| (5) The student uses graphs, tables, and algebraic representations to make predictions and solve problems. | Pages 26 - 26 |

Geometry and spatial reasoning

- | | |
|--|---------------|
| (6) The student uses transformational geometry to develop spatial sense. | Pages 27 - 28 |
| (7) The student uses geometry to model and describe the physical world. | Pages 28 - 32 |

Measurement

- | | |
|--|---------------|
| (8) The student uses procedures to determine measures of three-dimensional figures. | Pages 33 - 34 |
| (9) The student uses indirect measurement to solve problems. | Pages 34 - 35 |
| (10) The student describes how changes in dimensions affect linear, area, and volume measures. | Pages 35 - 35 |

Probability and statistics

- | | |
|--|---------------|
| (11) The student applies concepts of theoretical and experimental probability to make predictions. | Pages 36 - 39 |
| (13) The student evaluates predictions and conclusions based on statistical data. | Pages 40 - 41 |

Underlying processes and mathematical tools

- | | |
|---|---------------|
| (14) The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. | Pages 42 - 45 |
| (15) The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. | Pages 45 - 47 |
| (16) The student uses logical reasoning to make conjectures and verify conclusions. | Pages 47 - 49 |

TEKS that are ***not included*** in the current Understanding Math 2008© programs are noted as *not yet correlated*.



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Grade 8... Number, operation, and quantitative reasoning

(1) The student understands that different forms of numbers are appropriate for different situations. The student is expected to:

(A) compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals;

Understanding Whole Numbers and Integers 2008

Notes

Section 1: The Meaning of Whole Numbers

Place Value to 999 999

- Examples- Example 1
- Examples- Example 2
- Examples- Example 3
- Examples- Example 4
- Examples- Example 5
- The number line- Example 1
- The number line- Example 2
- The number line- Example 3

Millions

- Examples- Example 1
- Examples- Example 2
- Examples- Example 3
- Examples- Example 4
- The number line

Billions

Example

Comparing Large Numbers

- Example 1
- Example 2
- Example 3
- Example 4

Ordering Large Numbers

- Example 1
- Example 2

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	Example 3	
	Example 4	
Understanding Whole Numbers and Integers 2008		Notes
Section 4: The Meaning of Integers		
Integer Line		
Comparing Integers	Example 1	
	Example 2	
	Explanation	
	Example 3	
	Example 4	
Example Questions	Example 1	
	Example 2	
	Example 3	
	Example 4	
	Example 5	
	Example 6	
Understanding Fractions 2008		Notes
Section 3: Equivalent Fractions		
An Explanation With Sets	Case 1	
	Case 2	
	Summary	
Equivalent Fractions on a Number Line		
Comparison of Fractions		
Equivalent Fractions in a Multiplication Table		
One		
Equivalent Fractions... The Pattern		
Expressing Fractions in Simplest Form	Example 1- Method 1	
	Example 1- Method 2	
	Example 2- Method 1	
	Example 2- Method 2	
	Example 3- Method 1	
	Example 3- Method 2	
	Example 4- Method 1	
	Example 4- Method 2	
	Example 5- Method 2	

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Memory Game	Easy Game Hard Game Instructions	
Understanding Fractions 2008 Section 4: Percent... A Special Fraction Making Sense of Percent	1. Weather 2. Square 3. Election 4. Photocopier 5. Car Trip	Notes
Understanding Fractions 2008 Section 5: Introduction to Decimals Introduction to Decimals	Decimals on a number line- Example 1 Decimals on a number line- Example 2 Decimals on a number line- Example 3 Decimals on a number line- Example 4 Decimals on a number line- Example 5 Place Value- Ones and Tenths 1 Place Value- Ones and Tenths 2 Place Value- Tens, Ones and Tenths Place Value- Decimals on a number line Place Value- Hundreds and Tenths Greater and Less Than	Notes
Understanding Place Value	Example 1 Example 2 Example 3 Example 4	
Equivalent Decimals	Example 1 Example 2 Example 3	
Comparing Decimals	Example 1 Example 2 Example 3 Example 4	

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Ordering Decimals	Introduction Example 1 Example 2 Example 3 Example 4	
Understanding Fractions 2008		Notes
Section 6: Percents... Fractions... Decimals		
Expressing a Percent as a Fraction	Introduction Without Graphics Introduction With Graphics Expressing a Fraction In Simplest Form- Greatest Common Factor Expressing a Fraction In Simplest Form Expressing a Fraction In Simplest Form- Simplifying Fractions Expressing a Fraction In Simplest Form Examples- Example 1 Examples- Example 2 Examples- Example 3 Examples- Example 4 The Watering Can	
Expressing a Percent as a Decimal	Introduction Example 1 Example 2 Example 3	
Number Line #1		
Decimal Strips	Concept 1 Concept 2 Concept 3	
Expressing Decimals as a Percent	Example 1 Example 2 Example 3 Summary Pattern % Nitrogen in Air Batting Averages	
Expressing Fractions as a Percent	An Example Method 1- Example 1 Method 1- Example 2 Method 2- Example 1	

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<p>Number Line #2 Chart Order Fractions, Decimals, Percent Practice Questions Topic Test</p>	<p>Method 2- Example 2 Lightning Example</p> <p>5 questions (randomly generated) 11 questions (randomly generated) 10 questions (randomly generated)</p>	
<p>Understanding Fractions 2008</p> <p>Section 13: Improper Fractions and Mixed Numbers</p> <p>Mixed to Improper</p> <p>Improper to Mixed</p>		<p>Notes</p> <p>Method 1- Example 1 Method 1- Example 2 Method 2- Example 1 Method 2- Example 2 Practice Questions- 5 questions (randomly generated) Example 1 Example 2 Practice Questions</p>
<p>(B) select and use appropriate forms of rational numbers to solve real-life problems including those involving proportional relationships;</p>		
<p>Understanding Whole Numbers and Integers 2008</p> <p>Section 5: Adding Integers</p> <p>Word Problems</p>		<p>Notes</p> <p>Temperature Money Car</p>
<p>Understanding Whole Numbers and Integers 2008</p> <p>Section 6: Subtracting Integers</p> <p>Word Problems</p>		<p>Notes</p> <p>The Sailboat The Bank</p>
<p>Understanding Whole Numbers and Integers 2008</p> <p>Section 7: Multiplying Integers</p> <p>Word Problems</p>		<p>Notes</p> <p>Washing Cars The Helicopter Construction</p>

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Understanding Whole Numbers and Integers 2008	Notes
Section 8: Dividing Integers	
Word Problems	Casino Plant Graham's Walk
Understanding Whole Numbers and Integers 2008	Notes
Section 9: Order of Operations	
Order in Addition - Whole Numbers	Trial 1 Trial 2 Conclusion Example 1 Example 2
Order in Addition - Integers	Trial 1 Trial 2 Conclusion Example 1 Example 2
Order in Multiplication - Whole Numbers	Trial 1 Trial 2 Conclusion Example 1 Example 2
Order in Multiplication - Integers	Trial 1 Trial 2 Conclusion Example 1 Example 2
Why Use Order of Operations? - Whole Numbers	
Why Use Order of Operations? - Integers BEDMAS	
Please Excuse My Dear Aunt Sally	
Example Questions - Whole Numbers	BEDMAS- Example 1 BEDMAS- Example 2 BEDMAS- Example 3

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Example Questions - Integers

BEDMAS- Example 4
BEDMAS- Example 5
BEDMAS- Example 6
BEDMAS- Example 7
BEDMAS- Example 8
BEDMAS- Example 9
BEDMAS- Example 10
Please Excuse My Dear Aunt Sally- Example 1
Please Excuse My Dear Aunt Sally- Example 2
Please Excuse My Dear Aunt Sally- Example 3
Please Excuse My Dear Aunt Sally- Example 4
Please Excuse My Dear Aunt Sally- Example 5
Please Excuse My Dear Aunt Sally- Example 6
Please Excuse My Dear Aunt Sally- Example 7
Please Excuse My Dear Aunt Sally- Example 8
Please Excuse My Dear Aunt Sally- Example 9
Please Excuse My Dear Aunt Sally- Example 10
BEDMAS- Example 1
BEDMAS- Example 2
BEDMAS- Example 3
BEDMAS- Example 4
BEDMAS- Example 5
BEDMAS- Example 6
BEDMAS- Example 7
BEDMAS- Example 8
BEDMAS- Example 9
BEDMAS- Example 10
Please Excuse My Dear Aunt Sally- Example 1
Please Excuse My Dear Aunt Sally- Example 2
Please Excuse My Dear Aunt Sally- Example 3
Please Excuse My Dear Aunt Sally- Example 4
Please Excuse My Dear Aunt Sally- Example 5
Please Excuse My Dear Aunt Sally- Example 6
Please Excuse My Dear Aunt Sally- Example 7
Please Excuse My Dear Aunt Sally- Example 8
Please Excuse My Dear Aunt Sally- Example 9
Please Excuse My Dear Aunt Sally- Example 10

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Word Problems	Shipping Babysitting Garbage	
Practice Questions	Please Excuse My Dear Aunt Sally- 10 questions (randomly generated)	
Topic Test	10 questions (randomly generated)	
Understanding Fractions 2008		Notes
Section 8: Adding Fractions		
Word Problems	Alexander's Friend Eating Candy Goal Scoring Taking a Walk	
Understanding Fractions 2008		Notes
Section 9: Subtracting Fractions		
Word Problems	Pedro and Alex's Race Washing the Cars Planting a Garden	
Understanding Fractions 2008		Notes
Section 10: Multiplying Fractions		
Word Problems	Boris' Money Maria's Trip	
Order in Multiplying	Example 1 Example 2	
Multiplying Fractions with Larger Numbers	Example 1 Example 2	
Multiplying Many Fractions	Example 1 Example 2	
Understanding Fractions 2008		Notes
Section 11: Dividing Fractions		
Understanding Division	Recall from Whole Numbers Introduction	
Examples With Diagrams	Soda Pop Ice Cream Shape 1 Shape 2	

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Patterns from Examples Another Explanation	Example 1 Example 2	
Examples Without Diagrams	Numerical Example 1 Numerical Example 2 Central High School	
Practice Questions Topic Test	10 questions (randomly generated) 10 questions (randomly generated)	
Understanding Fractions 2008 Section 12: Order of Operations		Notes
Order in Addition	Trial 1 Trial 2 Conclusion Example 1 Example 2	
Order in Multiplication	Trial 1 Trial 2 Conclusion Example 1 Example 2	
Why use Order of Operations? BEDMAS Please Excuse My Dear Aunt Sally Example Questions	Example 1 Example 2 Example 3	
Practice Questions Topic Test	3 questions (randomly generated) 10 questions (randomly generated)	

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(C) approximate (mentally and with calculators) the value of irrational numbers as they arise from problem situations (such as π , $\sqrt{2}$);

Understanding Measurement and Geometry 2008		Notes
Section 3: Circles		
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 of a Circle	
	Ex. 1 - Ogg	
	Ex. 2 - The Well	
	Ex. 3 - The Rolling Coin	
	Ex. 4 - The Semi-Circle	
AREA of a Circle	Recall Area	
	Area Exploration #1	
	Area Exploration #2	
	Ex. 1 - Wheel	
	Ex. 2 - Pizza	
	Ex. 3 - The Semi-Circle	
	Ex. 4 - The Dog's Run	
	Ex. 5 - The Hockey Rink	
	Ex. 6 - Circle and Square	
Practice Questions	5 questions (randomly generated)	
Topic Test	10 questions (randomly generated)	
Understanding Exponents 2008		
Section 5 : Square Root		
Squaring Numbers	Examples 1	
	Examples 2	
Square Roots		
Radical Signs		
Square Roots of Negative Numbers		
Example Questions	1. Radicals First	
	2. The Four Equations	
	3. Lawn Questions	
	4. Make a Square	
		Notes

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<p>Understanding Fractions 2008 Section 10: Multiplying Fractions Word Problems Order in Multiplying</p>	<p>Boris' Money Maria's Trip Example 1 Example 2</p>	<p>Notes</p>
<p>Understanding Fractions 2008 Section 11: Dividing Fractions Examples Without Diagrams</p>	<p>Central High School</p>	<p>Notes</p>
<p>Understanding Fractions 2008 Section 12: Order of Operations Order in Multiplication Why use Order of Operations? BEDMAS Please Excuse My Dear Aunt Sally</p>	<p>Example 1 Example 2</p>	<p>Notes</p>
<p>Understanding Fractions 2008 Section 14: Addition and Subtraction of Decimals Decimals Around Us</p>	<p>Length in Metric Units- Tools Length in Metric Units- Example 1 Length in Metric Units- Example 2 Length in Metric Units- Example 3 Length in Metric Units- Example 4 Length in Metric Units- Example 5 Pencils- Example 1 Pencils- Example 2 Pencils- Example 3 Pencils- Example 4 Pencils- Example 5 Money- Example 1 Money- Example 2 Money- Example 3 Money- Example 4 Money- Example 5 Track Meet- Example 1</p>	<p>Notes</p>

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	Track Meet- Example 2 Track Meet- Example 3 Track Meet- Example 4	
Understanding Fractions 2008 Section 15: Multiplication and Division of Decimals Decimals Around Us - Word Problems	Example 1 - Oranges Example 2 - Bananas Example 3 - Cycling Example 4 - Baseball Cards Example 5 - Cookies Example 6 - Running Example 7 - Apples Example 8 - Saving Example 9 - Skipping	Notes
(B) use appropriate operations to solve problems involving rational numbers in problem situations;		
Understanding Fractions 2008 Section 8: Adding Fractions Word Problems	Alexander's Friend Eating Candy Goal Scoring Taking a Walk	Notes
Understanding Fractions 2008 Section 9: Subtracting Fractions Word Problems	Pedro and Alex's Race Washing the Cars Planting a Garden	Notes
Understanding Fractions 2008 Section 10: Multiplying Fractions Word Problems	Boris' Money Maria's Trip	Notes

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Understanding Fractions 2008	Notes
Section 11: Dividing Fractions	
Practice Questions	10 questions (randomly generated)
Understanding Fractions 2008	Notes
Section 14: Addition and Subtraction of Decimals	
Decimals Around Us	Pencils- Example 1 Pencils- Example 2 Pencils- Example 3 Pencils- Example 4 Pencils- Example 5 Money- Example 1 Money- Example 2 Money- Example 3 Money- Example 4 Money- Example 5 Track Meet- Example 1 Track Meet- Example 2 Track Meet- Example 3 Track Meet- Example 4 Track Meet- Example 5 School Supplies
Understanding Fractions 2008	Notes
Section 15: Multiplication and Division of Decimals	
Decimals Around Us - Word Problems	Example 1 - Oranges Example 2 - Bananas Example 3 - Cycling Example 4 - Baseball Cards Example 5 - Cookies Example 6 - Running Example 7 - Apples Example 8 - Saving Example 9 - Skipping

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(C) evaluate a solution for reasonableness; and		
Understanding Whole Numbers and Integers 2008		Notes
Section 4: The Meaning of Integers		
Number Sentence Factory	Control Room - Length of Timer Training Room Training Room Training Room Factory Floor- 5 questions (randomly generated)	
Understanding Fractions 2008		Notes
Section 13: Improper Fractions and Mixed Numbers		
Number Sentence Factory	Control Room - Length of Timer Training Room- Instructions Training Room- Demonstration Training Room- Scoring Factory Floor- 5 questions (randomly generated)	
(D) use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems.		
Understanding Measurement and Geometry 2008		Notes
Section 1: An Introduction to Measurement		
Metric Conversions - Length	Introduction - Off Computer Understanding Metric Prefixes Metric Prefixes at Work Metric Match - Introduction Metric Match – Ex amples- 3 questions (randomly generated) Converting	
US Standard Conversions - Length	Introduction - Off Computer Converting	
Measurement and Your Body - Metric	Golden Ratio- Introduction Golden Ratio- Part 1	

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	Golden Ratio- Part 2 Your Ratio	
Measurement and Your Body - US Standard	Golden Ratio- Introduction Golden Ratio- Part 1 Golden Ratio- Part 2 Your Ratio	
My Body - Metric and US Standard Rudy's Run Metric and US Standard		
Understanding Fractions 2008		Notes
Section 7: Ratios and Proportions		
Ratios in the News		
What is a Ratio?	Example 1 - Fraction Strip Example 2 - Balls Example 3 - Students Example 4 - Gears	
Writing Ratios	Concept Example 1 Example 2 Example 3 Example 4 Example 5 Example 6	
Rate and Unit Rate	Concept Examples The Best?- Example 1 The Best?- Example 2 The Best?- Example 3	
What is a Proportion?		
Proportions with Pattern Blocks	Example 1 Example 2 Example 3	
Proportions	Example 1 Example 2 - Lemonade Example 3 - Marbles Example 4 - Trout Example 5 -Tree Height	

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Ratio Table	Example 6 - Map Example 7 - Scale Drawing Introduction Example 1 Example 2 Example 3
Ratios and Your Body	Golden Ratio- Introduction Golden Ratio- Part 1 Golden Ratio- Part 2 Measuring Your Body
Practice Questions	10 questions (randomly generated)
Topic Test	10 questions (randomly generated)

Grade 8... Patterns, relationships, and algebraic thinking

**(3) The student identifies proportional or non-proportional linear relationships in problem situations and solves problems.
The student is expected to:**

(A) compare and contrast proportional and non-proportional linear relationships;

Understanding Graphing 2008

Notes

Section 5 : Relations, Equations and Functions

In This Topic

Relations

What is a Relation?

Domain and Range

Example 1: Triangle- Display the Relation

Example 1: Triangle- Describe the Relation

Example 1: Triangle- Predict New Information

Example 2: Tiles, Part 1

Example 3: Tiles, Part 2- Introduction - The Garden

Example 3: Tiles, Part 2- The Problem

Example 3: Tiles, Part 2- Patterns from Pictures #1

Example 3: Tiles, Part 2- Patterns from Pictures #2

Example 3: Tiles, Part 2- Patterns from Pictures #3

Example 3: Tiles, Part 2- Patterns from Pictures #4

Example 3: Tiles, Part 2- Summary

Example 4 Running- Display the Relation

Example 4 Running- Describe the Relation

Example 4 Running- Predict New Information

Example 5: Hit the Ball

Patterns to Words to Equations

Example 1

Example 2

Example 3

Example 4

Understanding Graphing 2008

Notes

Section 6: Linear Relations

In This Topic

What is a Linear Relation?

Graphs of Linear Relations

Concept

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	Examples- Example 1
	Examples- Example 2
	Examples- Example 3
	Examples- Example 4
	Examples- Example 5
	Examples- Example 6
The Taxi Example	Setup Equations Graph Equations
The Elastic Example	Setup Equations Graph
Lightning Example	Setup Equations Graph

(B) estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates.

Understanding Percent 2008

Notes

Section 1 : The Meaning of Percent

In This Topic

Percent In The News

Percent Means

Introduction

Percent Strips

Examples

Making Sense of Percent

Ex. 1 School Example

Ex. 2 Money Example

Concept 1

Concept 2

Concept 3

1. Barrel Example

2. Red Squares

3. Blue Squares

4. Green Blocks

5. Ruler

1. Weather

2. Squares

3. Election

4. Photocopier

5. Car Trip

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Estimating Percent of a Bar (randomly generated)		
Estimation on the Percent Line (randomly generated)		
Practice Questions	6 questions (randomly generated)	
Topic Test	10 questions (randomly generated)	
Understanding Percent 2008		Notes
Section 4: Ratios and Proportions		
Rates and Unit Rate	Concept Examples The Best?- Example 1 The Best?- Example 2 The Best?- Example 3	
Proportions	Example 1 Example 2 - Lemonade Example 3 - Marbles Example 4 - Trout Example 5 - Tree Height Example 6 - Map Example 7 - Scale Drawing	
Ratio Table	Introduction Example 1 Example 2 Example 3	
Understanding Percent 2008		Notes
Section 5 : Percent of a Number		
Concept		
Examples	1. Money 2. Service Charge 3. Birds 4. Marathon Race 5. Freezing 6. Pie Chart	
The Bouncing Ball		

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Understanding Percent 2008		Notes
Section 6: Problems Involving Percent		
In This Topic		
Steps in Solving Problems		
Finding The Whole	Recall Proportionals School Population: Method 1... Using Proportions School Population: Method 2 Grades Problem: Method 1... Using Proportions Grades Problem: Method 2 Bike Sale: Method 1... Using Proportions Bike Sale: Method 2	
Finding The Percent	Theatre Example Car Example	
Percent of a Number	Earnings Example Nickel Ore Example	
Percent Greater than 100%	Number Example Order Example	
Percent Less than 1%	Number Example Pencil Example	
Mental Calculation	Number Example Typing Example	
Percent Change	Interest Example Tree Example Percent Markup Example	
Practice Questions	10 questions (randomly generated)	
Topic Test	10 questions (randomly generated)	
Understanding Percent 2008		
Section 7: Percent in Business		
Sales Tax	The Bike The Coat Restaurant Tipping	
Discount	Football Sale What Can I Afford?	
Commission	Car Salesman Real Estate Car Dealerships	
		Notes

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(4) The student makes connections among various representations of a numerical relationship. The student is expected to

generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).

Understanding Graphing 2008

Section 5 : Relations, Equations and Functions

Notes

Relations

- Example 1: Triangle- Display the Relation
- Example 1: Triangle- Describe the Relation
- Example 1: Triangle- Predict New Information
- Example 4 Running- Display the Relation
- Example 4 Running- Describe the Relation
- Example 4 Running- Predict New Information

Patterns to Words to Equations

- Example 1
- Example 2
- Example 3
- Example 4

Understanding Graphing 2008

Section 6: Linear Relations

Notes

The Taxi Example

- Setup Equations
- Graph Equations

The Elastic Example

- Setup Equations
- Graph

Lightning Example

- Setup Equations
- Graph

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(5) The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to:

(A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations;

Understanding Graphing 2008

Section 6: Linear Relations

The Taxi Example

Setup Equations

Graph Equations

The Elastic Example

Setup Equations

Graph

Lightning Example

Setup Equations

Graph

Notes

(B) find and evaluate an algebraic expression to determine any term in an arithmetic sequence (with a constant rate of change).

Understanding Algebra 2008

Section 3: Patterns, Patterns, Patterns

Patterns to Formulas

Example 1

Example 3

Example 4

Example 5

Notes

Understanding Algebra 2008

Section 4: Patterns, Formulas, Substitution

Patterns... Toothpicks

Introduction

Exploration

To Formula- Pattern 1

To Formula- Pattern 2

To Formula- Pattern 3

To Formula- Pattern 4

Summary

Notes

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Grade 8... Geometry and spatial reasoning

(6) The student uses transformational geometry to develop spatial sense. The student is expected to:

(A) generate similar figures using dilations including enlargements and reductions;

Understanding Fractions 2008		Notes
Section 7: Ratios and Proportions		
Proportions	Example 5 - Tree Height Example 6 - Map Example 7 - Scale Drawing	
Understanding Graphing 2008		
Section 4: Transformations		
Dilations	Object to Image We Say, We Write Dilation Mapping Rule Examples- Example 1 Examples- Example 2	Notes

(B) graph dilations, reflections, and translations on a coordinate plane.

Understanding Graphing 2008		Notes
Section 4: Transformations		
In This Topic		
What is a Transformation?		
Introduction to Common Transformations		
Translations - An Introduction	Slide #1 Slide #2 Slide #3 Slide #4	
Reflections - An Introduction	Flip #1 Flip #2 Flip #3	
Translations	Object to Image We Say, We Write	

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Reflections	Translation Mapping Rule Examples- Example 1 Examples- Example 2 Examples- Example 3 Object to Image We Say, We Write Reflection Mapping Rule Examples- Example 1
Dilations	Examples- Example 2 Object to Image We Say, We Write Dilation Mapping Rule Examples- Example 1 Examples- Example 2

(7) The student uses geometry to model and describe the physical world. The student is expected to:

(A) draw three-dimensional figures from different perspectives;

Understanding Measurement and Geometry 2008

Notes

Section 8: Projective Geometry

An Introduction

Toothpicks on Isometric Dot Paper

Toothpick to Cube

The Views

Using Isometric Grid Paper- Solid 1

Using Isometric Grid Paper- Solid 2

Using Isometric Grid Paper- Solid 3

Using Isometric Grid Paper- Solid 4

Using Isometric Grid Paper- Solid 5

Orthographic Projections: Introduction

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The Cube Tool	Introduction Tutorial- Deleting Tutorial- Views Tutorial- Up and Down Tutorial- Rotation Play with the Tool
Given Solid - Build it	Example 1 Example 2 Example 3 Example 4 Example 5 Example 6
Given Views - Build it	Example 1 Example 2 Example 3 Example 4 Example 5 Example 6
Given Volume - Build it	Example 1 Example 2 Example 3 Example 4 Example 5 Example 6
Given Area - Build it	Example 1 Example 2 Example 3 Example 4 Example 5 Example 6
Practice Questions	5 questions (randomly generated)

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(B) use geometric concepts and properties to solve problems in fields such as art and architecture;

Understanding Measurement and Geometry 2008

Section 2: Perimeter and Area of Polygons

Walk Around a Polygon

Perimeter of The Ranch

Length of the Metal Strip

Find the Perimeter - 3 Examples

Areas of Polygons

Area of a Rectangle- Example 4

Polygons Broken into Simpler Shapes- Example 1

Polygons Broken into Simpler Shapes- Example 2

Polygons Broken into Simpler Shapes- Example 3

Problem Section

Length of Fence

Area of Wall

The Tablecloth

Notes

Understanding Measurement and Geometry 2008

Section 3: Circles

Circumference of a Circle

Ex. 3 - The Rolling Coin

Ex. 4 - The Semi-Circle

AREA of a Circle

Recall Area

Area Exploration #1

Area Exploration #2

Ex. 1 - Wheel

Ex. 2 - Pizza

Ex. 3 - The Semi-Circle

Ex. 4 - The Dog's Run

Ex. 5 - The Hockey Rink

Ex. 6 - Circle and Square

Notes

Understanding Measurement and Geometry 2008

Section 4: Solids.. Volume and Surface Area

Volume of a Solid

Concept

Volume of a Prism: Example 1

Volume of a Prism: Example 2

Volume of a Cylinder

Volume of a Pyramid

Volume of a Cone

Notes

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(C) use pictures or models to demonstrate the Pythagorean Theorem; and		Notes
Understanding Exponents 2008 Section 6: Pythagorean Theorem In This Topic The Right Triangle Math or Magic? Squares on a Grid Squares on the Sides of a Right Triangle The Pythagorean Theorem		
	Introduction Omar's Rope Trick #1 Omar's Rope Trick #2 Our Rope Trick Example 1 Example 2 Example 3 Example 4 Triangle #1 Triangle #2 Triangle #3 The Pattern In General Theorem	
(D) locate and name points on a coordinate plane using ordered pairs of rational numbers.		Notes
Understanding Graphing 2008 Section 1: Reading And Sketching Graphs Discrete Data Continuous Data Understanding Graphing 2008 Section 3: Points on a Grid In This Topic Josh's Neighbourhood Grids on Maps		
	Concept Number Houses Given Coordinates... Find Location Examples Given Location... Find Coordinates Goin' Fishin - Practice	Notes

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<p>Ordered pairs</p> <p>Shapes Battleship Topic Test</p>	<p>Axis Quadrants and Cartesian Plane Finding a Point Order is Important Examples- Example 1 Examples- Example 2 Examples- Example 3 Randomly Generated Randomly Generated 5 questions (randomly generated)</p>	<p>Notes</p>
<p>Understanding Graphing 2008 Section 5 : Relations, Equations and Functions Relations</p>	<p>Example 4 Running- Display the Relation</p>	

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Grade 8... Measurement

(8) The student uses procedures to determine measures of three-dimensional figures. The student is expected to:

(A) find lateral and total surface area of prisms, pyramids, and cylinders using concrete models and nets (two-dimensional models);

Understanding Measurement and Geometry 2008

Notes

Section 4: Solids.. Volume and Surface Area

Surface Area of a Solid	Concept
	Surface Area of a Pyramid
	Surface Area of a Cylinder

(B) connect models of prisms, cylinders, pyramids, spheres, and cones to formulas for volume of these objects; and

Understanding Measurement and Geometry 2008

Notes

Section 4: Solids.. Volume and Surface Area

Volume of a Solid	Concept
	Volume of a Prism: Example 1
	Volume of a Prism: Example 2
	Volume of a Cylinder
	Volume of a Pyramid
	Volume of a Cone
	Volume of a Sphere

Understanding Exponents 2008

Notes

Section 2 : Exponents in Formulas

Volume Formulas Involving Exponents

(C) estimate measurements and use formulas to solve application problems involving lateral and total surface area and volume.

Understanding Measurement and Geometry 2008

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Section 4: Solids.. Volume and Surface Area

Surface Area of a Solid	Concept
	Surface Area of a Pyramid
	Surface Area of a Cylinder

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<p>Volume of a Solid</p> <p>Understanding Exponents 2008 Section 2 : Exponents in Formulas</p> <p>Examples with Area Formulas</p> <p>Examples with Volume Formulas</p>	<p>Concept</p> <p>Volume of a Prism: Example 1</p> <p>Volume of a Prism: Example 2</p> <p>Volume of a Cylinder</p> <p>Volume of a Pyramid</p> <p>Volume of a Cone</p> <p>Example 1</p> <p>Example 2</p> <p>Example 3</p> <p>Example 1</p> <p>Example 2</p> <p>Example 3</p>	<p align="right">Notes</p>
<p>(9) The student uses indirect measurement to solve problems. The student is expected to:</p>		
<p>(A) use the Pythagorean Theorem to solve real-life problems; and</p>		
<p>Understanding Exponents 2008 Section 6: Pythagorean Theorem</p> <p>Example Questions</p> <p>Practice Questions</p>	<p>Example 1... Pole Example</p> <p>Example 2... Tower Example</p> <p>Example 3... Walking Example</p> <p>Example 4... Lake Example</p> <p>Example 5... Geometric Example</p> <p>5 questions (randomly generated)</p>	<p align="right">Notes</p>

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(B) use proportional relationships in similar two-dimensional figures or similar three-dimensional figures to find missing measurements.		
Understanding Measurement and Geometry 2008		Notes
Section 9: Ratios for Areas and Volumes		
In This Topic		
Ratios	Introduction	
	Area	
	Volume	
Practice Questions	10 questions (randomly generated)	
Understanding Fractions 2008		Notes
Section 7: Ratios and Proportions		
Proportions	Example 5 - Tree Height	
	Example 7 - Scale Drawing	
(10) The student describes how changes in dimensions affect linear, area, and volume measures. The student is expected to:		
(A) describe the resulting effects on perimeter and area when dimensions of a shape are changed proportionally; and		
Understanding Measurement and Geometry 2008		Notes
Section 2: Perimeter and Area of Polygons		
Fractions of a Square	Part 1- One Quarter	
	Part 1- One Eighth	
Relationship - Area and Perimeter	The Information	
	The Graph- Length and Area	
Understanding Measurement and Geometry 2008		Notes
Section 4: Solids.. Volume and Surface Area		
Summary		
(B) describe the resulting effect on volume when dimensions of a solid are changed proportionally.		
Understanding Measurement and Geometry 2008		Notes
Section 4: Solids.. Volume and Surface Area		
Summary		

Grade 8... Probability and statistics

(11) The student applies concepts of theoretical and experimental probability to make predictions. The student is expected to:

(A) find the probabilities of dependent and independent events;

Understanding Probability 2008

Section 2: What's the Chance

Probability

What is it

Introduction 1

Introduction 2

Probability Examples

1. Coin Toss

2. Picking 1 Ball

3. Picking 2 Balls

4. Spinner #1

5. Spinner #2

6. The Bag

7. Travel Example

8. Number Example

9. Rabbit Example

10. Mailing Letters

11. Forest

12. Ahmed's Maze

Notes

Understanding Probability 2008

Section 7: Independent Events

In This Topic

What Are They

Examples

1. Toss 2 Coins

2. Replacing Marbles

Probability

1. Coin and Die

2. Balls

3. Letter Tiles

Patterns and Summary

1. Summary

Notes

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Practice Questions	<ul style="list-style-type: none"> 2. Spinner 3. Cards 5 questions (randomly generated) 	
Understanding Probability 2008		Notes
Section 8: Dependent Events		
In This Topic		
What Are They?	<ul style="list-style-type: none"> Independent Events Dependent Events 	
Examples	<ul style="list-style-type: none"> 1. Keep the First Marble 2. Choose the Flowers 	
Probability	<ul style="list-style-type: none"> 1. Keep the First Ball 2. Keep the First Tile 3. Keep the First Flower 	
Patterns and Summary	<ul style="list-style-type: none"> 1. Summary 2. Money 3. Socks 4. Names 	
Practice Questions	<ul style="list-style-type: none"> 5 questions (randomly generated) 	
(B) use theoretical probabilities and experimental results to make predictions and decisions; and		
Understanding Probability 2008		Notes
Section 2: What's the Chance		
Probability Scale	<ul style="list-style-type: none"> Examples Summary Follow up Soccer Example 	
Experimental Probability	<ul style="list-style-type: none"> Introduction Example 1 Example 2 	
Practice Questions	<ul style="list-style-type: none"> 10 questions (randomly generated) 	

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Understanding Probability 2008		Notes
Section 3: Dice Probabilities		
Roll One Die	Your Experiment Computer's Experiment Theoretical Probability Patterns Summary	
Roll Two Dice	Your Experiment Computer's Experiment Theoretical Probability Patterns Summary	
Practice Questions	5 questions (randomly generated)	
(C) select and use different models to simulate an event.		
Understanding Fractions 2008		Notes
Section 7: Ratios and Proportions		
Proportions	Example 3 - Marbles Example 4 - Trout	
Understanding Probability 2008		Notes
Section 1: Introduction to Probability		
Possible Outcomes	1. Coins 2. Pick 1 Ball 3. Pick 2 Balls 4. Eye Test 5. Travel	
Experiment with Spinners	Experiment 1 Experiment 2 Experiment 3 Experiment 4 Experiment 5 Experiment 6	

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The Spinner Game	Board 1- Single Player Board 1- 2 player Board 2- Single Player Board 2- 2 player	
IT's in the Bag Tree Diagrams	Board 2 Coin and Die Meals Socks Rabbits Forest	
Understanding Probability 2008 Section 4: Binomial Probabilities Binomial Probabilities... What are They? Flipping a Coin... Once Flipping a Coin... Twice Flipping a Coin... Three Times Summary Practice Questions		Notes
	5 questions (randomly generated)	
Understanding Probability 2008 Section 5: Geometric Probabilities In This Topic Introduction The Parachutist Dartboard		Notes
Win a Prize The Fly Baby Walk Practice Questions	Instructions Your Experiment Computer's Experiment Theoretical 6 questions (randomly generated)	

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(12) The student uses statistical procedures to describe data. The student is expected to:

(A) use variability (range, including interquartile range (IQR)) and select the appropriate measure of central tendency to describe a set of data and justify the choice for a particular situation;

Understanding Graphing 2008	Notes
Section 2: Statistics Measures of Central Tendency	Introduction The Mean Average The Median Average The Mode Summary Another Example Adding Data Points

(B) draw conclusions and make predictions by analyzing trends in scatterplots; and

Understanding Graphing 2008	Notes
Section 2: Statistics Presenting Data	Scatter Plot- Example 1... The T-Shirt Tailor Scatter Plot- Example 2... Matching

(C) select and use an appropriate representation for presenting and displaying relationships among collected data, including line plots, line graphs, stem and leaf plots, circle graphs, bar graphs, box and whisker plots, histograms, and Venn diagrams, with and without the use of technology.

Understanding Graphing 2008	Notes
Section 2: Statistics An Introduction Presenting Data	Bar Graph #1 Bar Graph #2 Line Graph #1 Line Graph #2 Stem and Leaf Diagram- Example 1... Age of Fans Stem and Leaf Diagram- Example 2... Height of Students Bar Graph- Example 1... Energy Bar Graph- Example 2... Lengths of Rivers Histogram- Example 1... Height of Students Histogram- Example 2... Roll of Die Line Graph- Example 1... Life Expectancy

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Box and Whisker Plot	Line Graph- Example 2... Software Profits Circle or Pie Graphs- Example 1... The Radio Station Circle or Pie Graphs- Example 2... Heath Survey Scatter Plot- Example 1... The T-Shirt Tailor Scatter Plot- Example 2... Matching Concepts Example1: Math Marks Example 2: Income in 1998
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(13) The student evaluates predictions and conclusions based on statistical data. The student is expected to:

(A) evaluate methods of sampling to determine validity of an inference made from a set of data;

Understanding Graphing 2008	Notes
Section 2: Statistics	
Data... What is it?	
Examples of Data	Example 1... Fast Food Earnings Example 2... Infants Walk Example 3... Canada and U.S.A. Forecast Example 4... King of the Strike Out Example 5... U.S. Stake in India Example 6... Allergy Troubles A Summary: Examples
Statistics... What is it?	
Collecting Data	Throw A Die Throw 2 Dice Voting Primary Data-Gathering Methods Secondary Data-Gathering Methods
Misleading Statistics	Example 1 Example 2

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(B) recognize misuses of graphical or numerical information and evaluate predictions and conclusions based on data analysis.

Understanding Graphing 2008

Section 2: Statistics

Misleading Statistics

Example 1

Example 2

Notes

Grade 8... Underlying processes and mathematical tools

(14) The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to:

(A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;

Identifying and applying mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics is embedded in Understanding Math 2008©. The programs emphasize understanding, learning from the concrete to the abstract, and thinking and doing rather than memorizing by rote. A mistake is an opportunity to learn.

The following are some examples:

Understanding Graphing 2008

Section 6: Linear Relations

Graphs of Linear Relations

Lightning Example

Baseball Example

Concept

Setup Equations

Graph

Setup Equations

Graph

Notes

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<p>Understanding Equations 2008 Section 5: Problem Solving Words and Symbols The Trick Machine</p> <p>Expressions - The Language of Algebra Area of Walls Chemistry Pool Puzzler - The First Problem</p>	<p align="right">Notes</p> <p>The Machine Explanations with Pictures Explanation with Symbols Example 2</p>
<p>(B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;</p>	
<p>Using a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness is embedded in Understanding Math 2008©. The programs emphasize understanding, learning from the concrete to the abstract, and thinking and doing rather than memorizing by rote. A mistake is an opportunity to learn.</p>	
<p>The following is an example:</p>	
<p>Understanding Percent 2008 Section 6: Problems Involving Percent Steps in Solving Problems</p>	<p align="right">Notes</p>
<p>Understanding Equations 2008 Section 5: Problem Solving Summary - Problem Solving Using Equations</p>	<p align="right">Notes</p>

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(C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem; and

Selecting or developing an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem is embedded in Understanding Math 2008©. The programs emphasize understanding, learning from the concrete to the abstract, and thinking and doing rather than memorizing by rote. A mistake is an opportunity to learn.

The following are some examples:

Understanding Graphing 2008

Notes

Section 8: Equation of a Straight Line

Word Problems-Applications

- The Taxi - Case 1- Task 1: Find the Equation
- The Taxi - Case 1- Task 2: Graph the Equation
- The Taxi - Case 1- Task 3: Interpret the Equation
- The Taxi - Case 2- Task 1: Find the Equation
- The Taxi - Case 2- Task 2: Graph the Equation
- The Taxi - Case 2- Task 3: Interpret the Equation
- The Taxi - Summary

(D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.

Selecting tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems is embedded in Understanding Math 2008©. The programs emphasize understanding, learning from the concrete to the abstract, and thinking and doing rather than memorizing by rote. A mistake is an opportunity to learn.

The following are some examples:

Understanding Measurement and Geometry 2008

Notes

Section 8: Projective Geometry

Orthographic Projections: Introduction

The Cube Tool

- Introduction
- Tutorial- Deleting
- Tutorial- Views
- Tutorial- Up and Down
- Tutorial- Rotation
- Play with the Tool

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Given Solid - Build it	Example 1	
	Example 2	
Given Views - Build it	Example 1	
	Example 2	
Given Volume - Build it	Example 1	
	Example 2	
Given Area - Build it	Example 1	
	Example 2	
Understanding Fractions 2008		Notes
Section 13: Improper Fractions and Mixed Numbers		
The Concept... Cubes	Represent Mixed Numbers	
Toothpicks and Paperclips	5 questions (randomly generated)	
Number Sentence Factory	Control Room - Length of Timer	
	Training Room- Instructions	
	Training Room- Demonstration	
	Training Room- Scoring	
	Factory Floor- 5 questions (randomly generated)	
(15) The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to:		
(A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and		
Communicating mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models is embedded in Understanding Math 2008© strategies such as the Flight Plan located on our website (http://www.neufeldmath.com/strategies/index.html)		
The following is an example within Understanding Math 2008©:		
Understanding Graphing 2008		Notes
Section 4: Transformations		
What is a Transformation?		
Introduction to Common Transformations		
Translations - An Introduction	Slide #1	

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Reflections - An Introduction Rotation - An Introduction Transformation Machine	Flip #1 Turn #1 Example 1	
Understanding Equations 2008 Section 5: Problem Solving Words and Symbols The Translation Machine	Example 1 Example 2 Example 3 Example 4	Notes
(B) evaluate the effectiveness of different representations to communicate ideas.		
Evaluating the effectiveness of different representations to communicate ideas is embedded in Understanding Math 2008© and Understanding Math 2008©. The programs emphasize understanding, learning from the concrete to the abstract, and thinking and doing rather than memorizing by rote. A mistake is an opportunity to learn.		
The following are some examples:		
Understanding Fractions 2008 Section 3: Equivalent Fractions Expressing Fractions in Simplest Form	Example 1- Method 1 Example 1- Method 2 Example 2- Method 1 Example 2- Method 2	Notes
Understanding Fractions 2008 Section 13: Improper Fractions and Mixed Numbers Mixed to Improper	Method 1- Example 1 Method 1- Example 2 Method 2- Example 1 Method 2- Example 2	Notes

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Understanding Percent 2008	Notes
Section 6: Problems Involving Percent	
Finding The Whole	School Population: Method 1... Using Proportions School Population: Method 2 Bike Sale: Method 1... Using Proportions Bike Sale: Method 2

(16) The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to:

(A) make conjectures from patterns or sets of examples and nonexamples; and

Making conjectures from patterns or sets of examples and nonexamples is embedded in Understanding Math 2008© and Understanding Math 2008©. The programs emphasize understanding, learning from the concrete to the abstract, and thinking and doing rather than memorizing by rote. A mistake is an opportunity to learn.

The following are some examples:

Understanding Probability 2008	Notes
Section 3: Dice Probabilities	
Roll One Die	Your Experiment Computer's Experiment Theoretical Probability Patterns Summary
Roll Two Dice	Your Experiment Computer's Experiment Theoretical Probability Patterns Summary

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Understanding Algebra 2008	Notes
<p>Section 4: Patterns, Formulas, Substitution</p> <p>Patterns... Toothpicks</p> <ul style="list-style-type: none"> Introduction Exploration To Formula- Pattern 1 To Formula- Pattern 2 To Formula- Pattern 3 To Formula- Pattern 4 Summary 	
<p>(B) validate his/her conclusions using mathematical properties and relationships.</p>	
<p>Validating his/her conclusions using mathematical properties and relationships is embedded in Understanding Math 2008©. The programs emphasize understanding, learning from the concrete to the abstract, and thinking and doing rather than memorizing by rote. A mistake is an opportunity to learn.</p>	
<p>The following are some examples:</p>	
<p>Understanding Fractions 2008</p> <p>Section 3: Equivalent Fractions</p> <p>An Explanation With Sets</p> <ul style="list-style-type: none"> Case 1 Case 2 Summary 	Notes
<p>Understanding Graphing 2008</p> <p>Section 5 : Relations, Equations and Functions</p> <p>Relations</p> <ul style="list-style-type: none"> What is a Relation? Domain and Range Example 2: Tiles, Part 1 Example 3: Tiles, Part 2- Introduction - The Garden Example 3: Tiles, Part 2- The Problem Example 3: Tiles, Part 2- Patterns from Pictures #1 Example 3: Tiles, Part 2- Patterns from Pictures #2 Example 3: Tiles, Part 2- Patterns from Pictures #3 Example 3: Tiles, Part 2- Patterns from Pictures #4 Example 3: Tiles, Part 2- Summary 	Notes



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Understanding Graphing 2008	Notes
Section 8: Equation of a Straight Line	
Word Problems-Applications	
	The Taxi - Case 1- Task 1: Find the Equation
	The Taxi - Case 1- Task 2: Graph the Equation
	The Taxi - Case 1- Task 3: Interpret the Equation
	The Taxi - Case 2- Task 1: Find the Equation
	The Taxi - Case 2- Task 2: Graph the Equation
	The Taxi - Case 2- Task 3: Interpret the Equation
	The Taxi - Summary

