ABE Mathematics Curriculum Matrix

Concept and Applications

Guide for Administrators and Educators

Institute for the Professional Development of Adult Educators

GUIDE FOR ADMINISTRATORS AND EDUCATORS

ABE Math Curriculum Matrix

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Resources Developed and Designed By
Ronald Cruz

ipdae
BY EDUCATORS FOR EDUCATORS

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Table of Contents

Contents at-a-Glance

Challenges Facing Adult Educators When It Comes to Mathematics Teaching

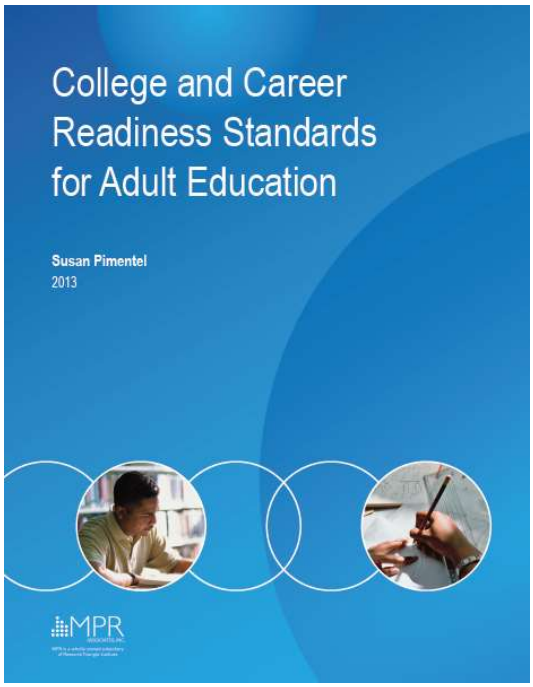
Adult Educators across the state are facing very similar challenges in the teaching of ABE Mathematics:

- Inconsistent background in math
- Unfamiliarity to certain math skills and concepts
- Limited understanding of the standards (CCRS)
- Lack of planning time
- Limited access to professional development
- Limited knowledge of math teaching strategies
- Limited resources for properly teaching math skills
- Massive and often multiple math content/curricula
- Catering to a very diverse group of students in terms of ability, background and goals

Important Questions to Teach Mathematics Effectively

- Where do I start?
- Which skills and concepts do my students need more mastery? How do I know now? How will I know in the future?
- How much time do I have to teach this topic?
- What topics should I teach next? What is the end goal?
- Is this skill assessed on standardized tests? How?
- How much of this content is assessed on standardized tests?
- What is the best textbook out there? Or websites to use?

The College and Career Readiness Standards



Questions:

List down the Key Shifts in the Standards based on the College and Career Readiness Standards?

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_____
_____

What are the 3 components of rigor as explained by the College and Career Readiness Standards?

_____
_____
_____

Under Shift 1: Focus, what do teachers need to do?

Under Shift 2: Coherence, what do teachers need to do?

Under Shift 3: Rigor, what do teachers need to do?

Shift 1 - Focus

Instructions:

Using only the section of the ABE Mathematics Curriculum Matrix below, number the cells in logical order if you were to teach these topics in a sequence.

Domain	NRS Level 1		NRS Level 2			
1. Number and Operations: Base Ten	Place Value of 2-Digit Numbers	Add and Subtract 2-Digit Numbers	Place Value of 3-Digit Numbers	Add and Subtract 3-Digit Numbers	Round Whole Numbers to the Nearest Tens or Hundreds	Use Properties of Operations to Perform Multi-Digit Arithmetic
	Compare 2-Digit Numbers	Model Addition and Subtraction of 2-Digit Numbers	Compare 3-Digit Numbers	Model Addition and Subtraction of 3-Digit Numbers	Multiply 1-Digit Numbers By 2-Digit Multiples of 10	Mentally Add and Subtract 10 or 100 to 3-Digit Numbers
2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20	The Equal Sign	Solve Addition and Subtraction Problems within 100	Solve Multiplication and Division Problems within 100	Multiplication Facts within 100	Solve 2-Step Problems or Equations
	Commutative and Associative Property of Addition	Solving Addition and Subtraction Equations	Commutative and Associative Property of Multiplication	Solve Multiplication and Division Equations	Distributive Property of Multiplication	Model Multiplication and Division within 100

Explain why you sequenced these topics in this way?

_____
_____
_____
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_____
_____

Shift 2 - Coherence

Instructions:

Using a section of the ABE Mathematics Curriculum Matrix below, draw an arrow between topics that are directly related to each other.

Domain	NRS Level 1		NRS Level 2			
1. Number and Operations: Base Ten	Place Value of 2-Digit Numbers	Add and Subtract 2-Digit Numbers	Place Value of 3-Digit Numbers	Add and Subtract 3-Digit Numbers	Round Whole Numbers to the Nearest Tens or Hundreds	Use Properties of Operations to Perform Multi-Digit Arithmetic
	Compare 2-Digit Numbers	Model Addition and Subtraction of 2-Digit Numbers	Compare 3-Digit Numbers	Model Addition and Subtraction of 3-Digit Numbers	Multiply 1-Digit Numbers By 2-Digit Multiples of 10	Mentally Add and Subtract 10 or 100 to 3-Digit Numbers
2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20	The Equal Sign	Solve Addition and Subtraction Problems within 100	Solve Multiplication and Division Problems within 100	Multiplication Facts within 100	Solve 2-Step Problems or Equations
	Commutative and Associative Property of Addition	Solving Addition and Subtraction Equations	Commutative and Associative Property of Multiplication	Solve Multiplication and Division Equations	Distributive Property of Multiplication	Model Multiplication and Division within 100

Shift 3 - Rigor

Color, highlight or place a check mark on the domains below that emphasize conceptual understanding.

Domain
1. Number and Operations: Base Ten
2. Operations and Algebraic Thinking
3. Measurement and Data
4. Geometry
5. Number and Operations: Fractions
6. Expressions and Equations
7. The Number System
8. Ratios and Proportional Relationships
9. Statistics and Probability
10. Functions

Color, highlight or place a check mark on the domains below that emphasize procedural fluency.

Domain
1. Number and Operations: Base Ten
2. Operations and Algebraic Thinking
3. Measurement and Data
4. Geometry
5. Number and Operations: Fractions
6. Expressions and Equations
7. The Number System
8. Ratios and Proportional Relationships
9. Statistics and Probability
10. Functions

Color, highlight or place a check mark on the domains below that emphasize mathematical applications.

Domain
1. Number and Operations: Base Ten
2. Operations and Algebraic Thinking
3. Measurement and Data
4. Geometry
5. Number and Operations: Fractions
6. Expressions and Equations
7. The Number System
8. Ratios and Proportional Relationships
9. Statistics and Probability
10. Functions

The ABE Mathematics Curriculum Frameworks

Reflection:

How much time have you spent reviewing the ABE Mathematics Curriculum Frameworks?

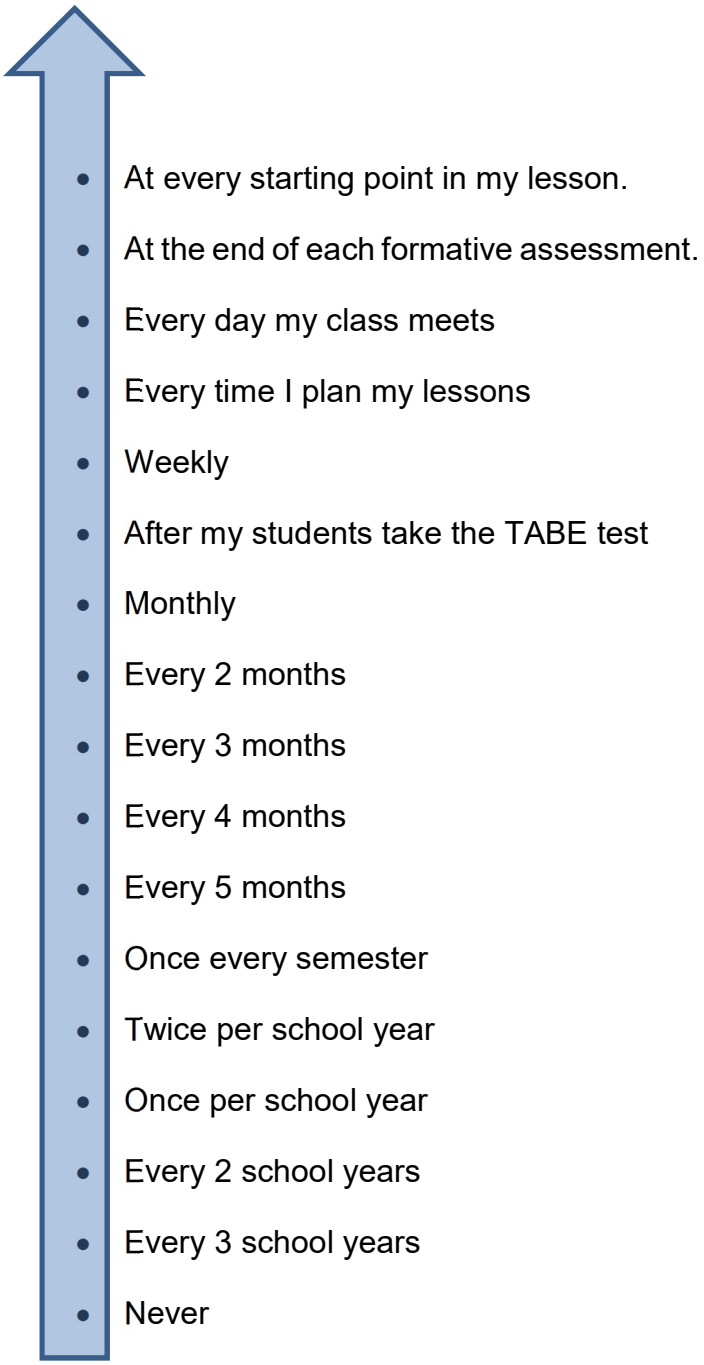
_____
_____
_____
_____
_____

How much time do you think you should spend reviewing the ABE Mathematics Curriculum Frameworks to ensure that you are teaching the required skills to your students?

_____
_____
_____
_____
_____

Activity:

Place an X on the continuum below to mark how often you review your ABE Mathematics Curriculum Frameworks. Place a star on how often do you think you should be reviewing your ABE Mathematics Curriculum Frameworks.



Gauge how much effort should you exert in order to implement best practice in reviewing the Curriculum Frameworks.

Review your copy of the ABE Mathematics Curriculum Frameworks and answer the questions below.

How many standards are contained in the ABE Mathematics Curriculum Frameworks?

_____

How many benchmarks are contained in the ABE Mathematics Curriculum Frameworks?

_____

Review your copy of the ABE Mathematics Curriculum Matrix and answer the question below.

How many topics/cells are contained in the ABE Mathematics Curriculum Matrix?

_____

Does this mean by using the ABE Mathematics Curriculum Matrix, we have to teach less topics? Explain why or why not.

_____
_____
_____
_____
_____

The Purpose of the ABE Mathematics Curriculum Frameworks

The Adult Basic Education (ABE) Program includes content standards that describe what students should know and be able to do in Mathematics. The content standards serve several purposes:

- Provide a common language for ABE levels among programs
- Assist programs with ABE curriculum development
- Provide guidance for new ABE instructors
- Ensure quality instruction through professional development
- Provide basic skills instruction (0.0 – 8.9) and critical thinking skills to prepare students for GED preparation (9.0 – 12.9), postsecondary education, and employment.

The content standards should be used as a basis for curriculum design and also to assist programs and teachers with selecting or designing:

- appropriate instructional materials
- instructional techniques, and
- ongoing assessment strategies.

Standards DO NOT tell teachers how to teach, but they do help teachers figure out the knowledge and skills their students should have so that teachers can build the best lessons and environments for their classrooms.

Features of ABE Mathematics Curriculum Frameworks

- 31 Pages
- 10 Mathematics Domains
- 79 Content Standards
- 294 Content Benchmarks
- 4 Career and Education Planning Standards
- 4 Digital Literacy (Technology) Standards
- 7 Workforce Preparation Activities

ABE Mathematics Domains

ADULT BASIC EDUCATION MATHEMATIC DOMAINS					
Domain Number	**NRS Reporting Grade Equivalent (GE)**	**NRS Level 1 0.0 – 1.9**	**NRS Level 2 2.0 – 3.9**	**NRS Level 3 4.0 – 5.9**	**NRS Level 4 6.0 – 8.9**
1	Number and Operations: Base Ten	0.0 – 1.9	2.0 – 3.9	4.0 – 5.9	
2	Operations and Algebraic Thinking	0.0 – 1.9	2.0 – 3.9	4.0 – 5.9	
3	Measurement and Data	0.0 – 1.9	2.0 – 3.9	4.0 – 5.9	
4	Geometry	0.0 – 1.9	2.0 – 3.9	4.0 – 5.9	6.0 – 8.9
5	Number and Operations: Fractions		*3.0 – 3.9	4.0 – 5.9	
6	Expressions and Equations			4.0 – 5.9	6.0 – 8.9
7	The Number System			4.0 – 5.9	6.0 – 8.9
8	Ratios and Proportional Relationships			4.0 – 5.9	6.0 – 8.9
9	Statistics and Probability			4.0 – 5.9	6.0 – 8.9
10	Functions				*7.0 – 8.9

Questions:

Which domain(s) span all 4 levels of ABE?

_____
_____
_____

Which domain(s) span only a single level of ABE?

_____
_____
_____

At what grade level are the standards for Ratio and Proportional Relationships taught?

_____
_____
_____

The ABE Mathematics Standards

Instructions:

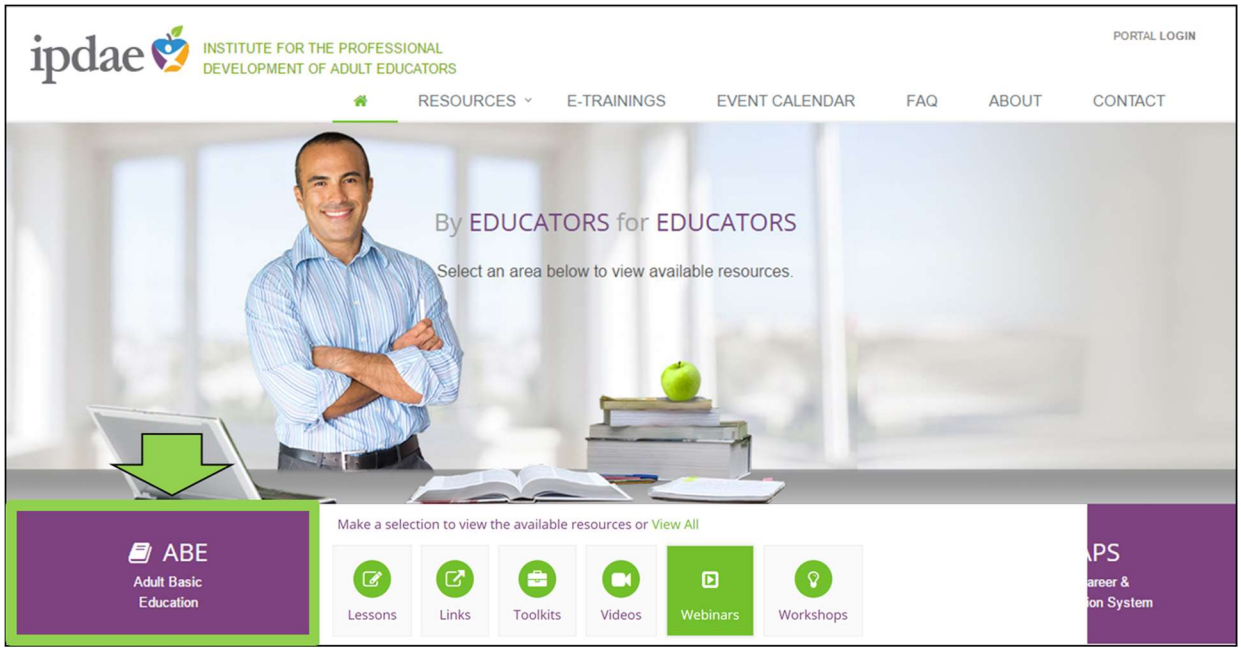
Label the diagram below by drawing an arrow from each component of the standards to the table to the right.

MATHEMATICS (MA) Basic Literacy GE: 0.0-3.9 Anchor Standards and Benchmark Skills	
NRS LEVEL 1 **GE: 0.0 – 1.9**	**NRS LEVEL 2** **GE: 2.0 – 3.9**
CCR.MA.ABE.1. **Number and Operations: Base Ten**	
1.1 Understand place value of two-digit numbers. a) Understand that the two digits of a two-digit number represent amounts of tens and ones. b) Compare two two-digit numbers recording the results of comparisons with the symbols greater than (>), equal to (=), and less than (<).	**2.1 Understand place value of three-digit numbers.** a) Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones. b) Count within 1000 by 5s, 10s, and 100s. c) Read and write numbers to 1000 using numerals, number names, and expanded form. d) Compare two three-digit numbers using greater than (>), equal to (=), and less than (<) symbols to record the results of comparisons.

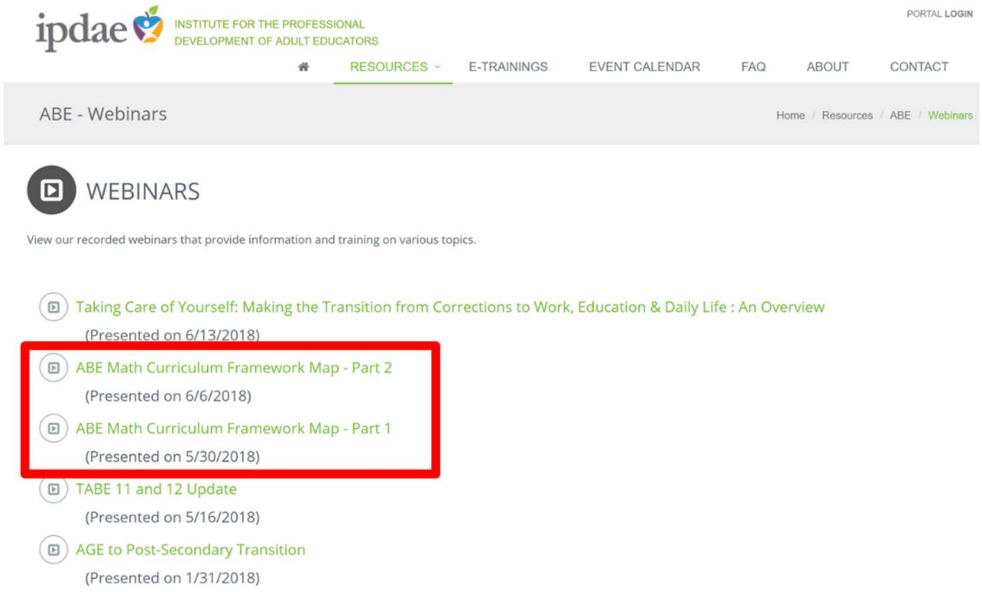
- ABE Level
- Domain
- Anchor Standards
- Benchmarks

How to Download the ABE Mathematics Curriculum Matrix

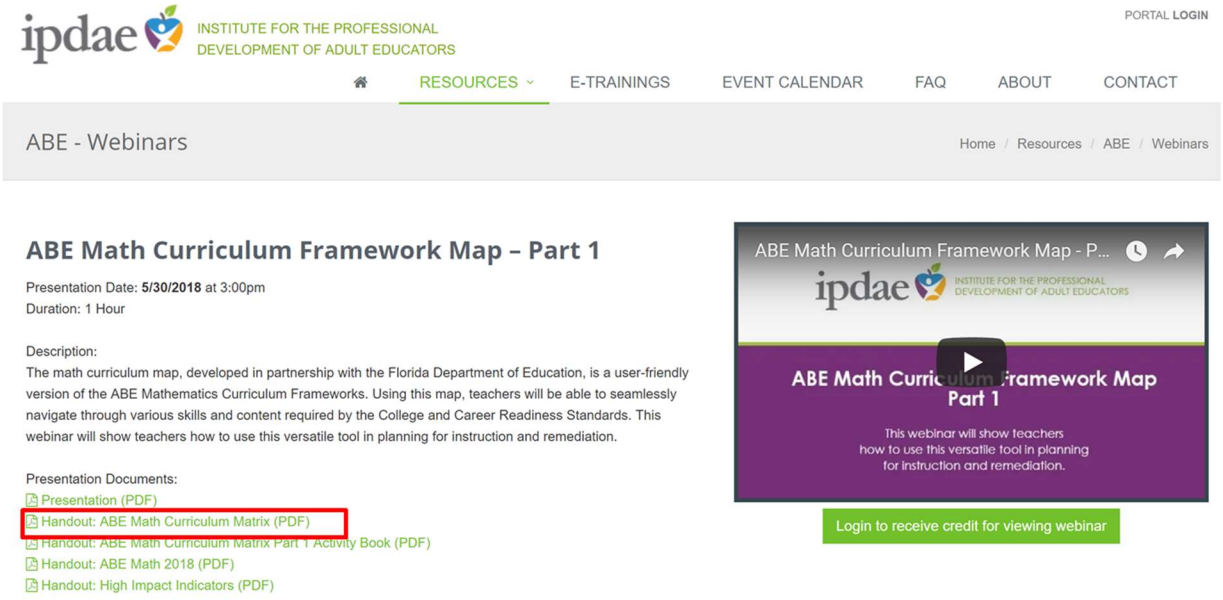
1. Type www.floridaipdae.org on the address bar of any browser.
2. Click on the ABE Tab.
3. Click on the Webinar Channel.



4. Click on the link for the ABE Math Curriculum Framework Map Webinar Part 1 or Part 2.



5. On the Presentation Documents Section of the page, click on Handout: ABE Math Curriculum Matrix (PDF).



Instructions:

List the steps on how to download the electronic copy of the ABE Mathematics Curriculum Matrix from the IPDAE Website.

_____

_____

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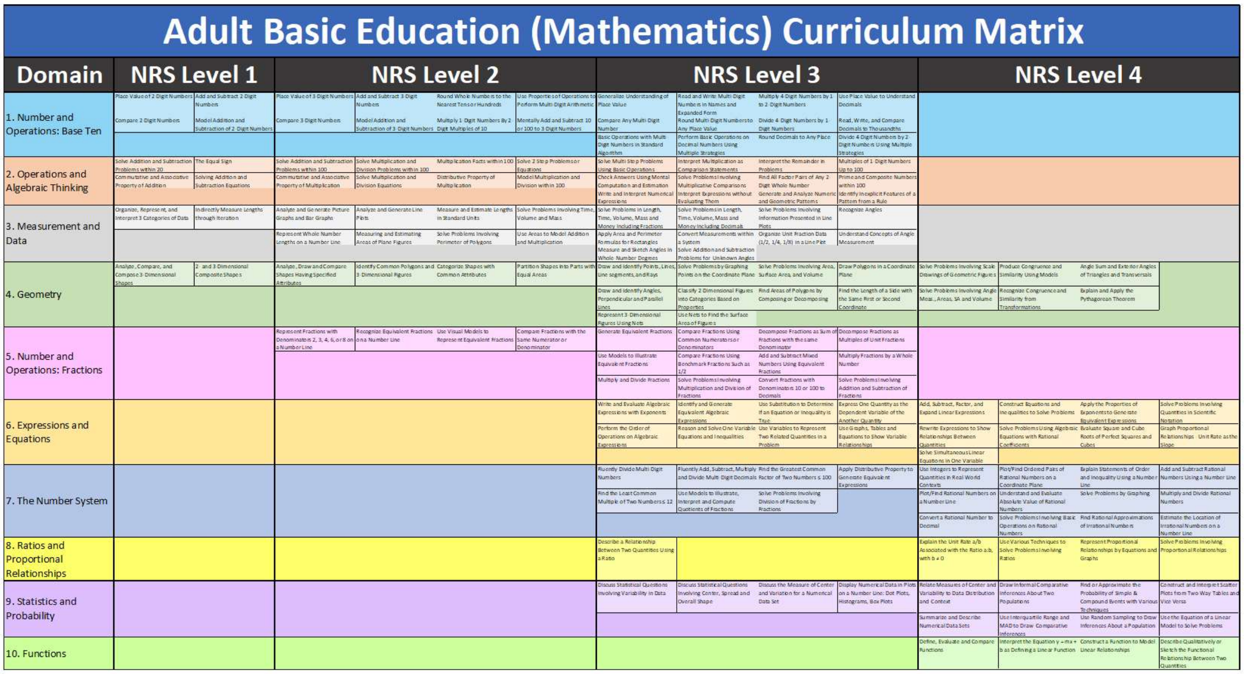
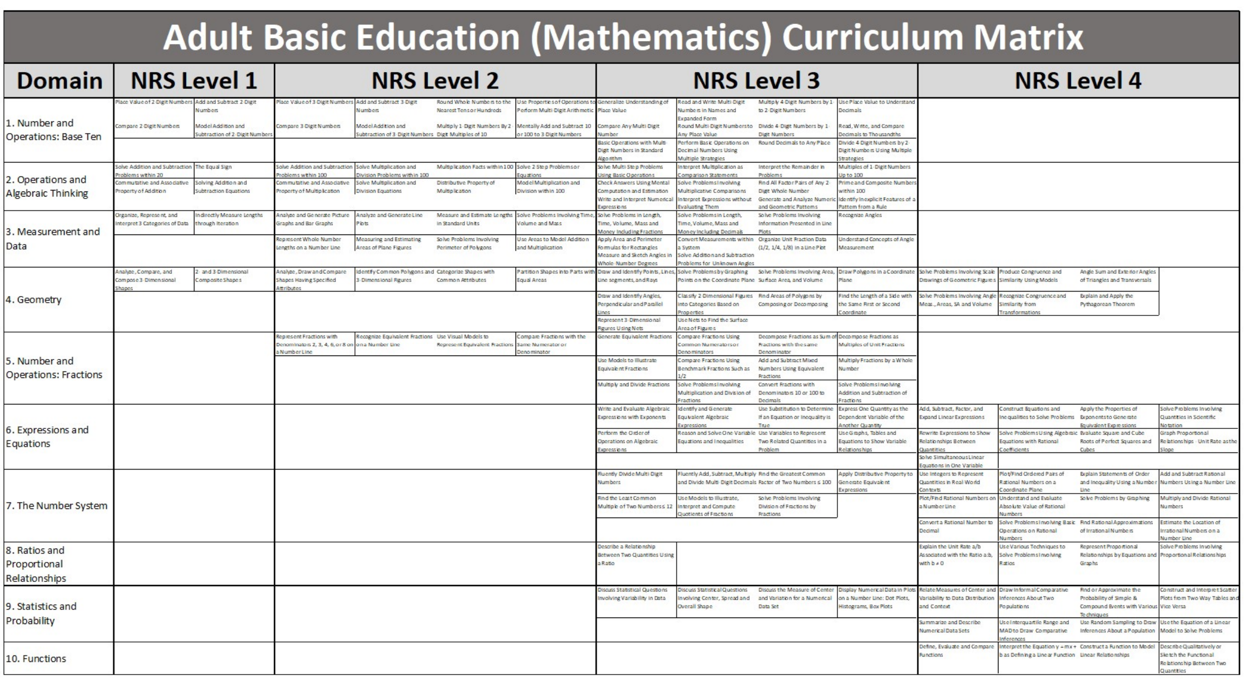
Versions of the Matrix

Original Version



Adult Basic Education (Mathematics) Curriculum Matrix				
Domain	**NRS Level 1**	**NRS Level 2**	**NRS Level 3**	**NRS Level 4**
1. Number and Operations: Base Ten	Place Value of 2 Digit Numbers Add and Subtract 2 Digit Numbers Compare 2 Digit Numbers Model Addition and Subtraction of 2 Digit Numbers	Place Value of 3 Digit Numbers Add and Subtract 3 Digit Numbers Round Whole Numbers to the Nearest Tens or Hundreds Use Properties of Operations to Perform Multi Digit Arithmetic Compare 3 Digit Numbers Model Addition and Subtraction of 3 Digit Numbers Multiply 1 Digit Numbers By 2 Digit Multiples of 10 Mentally Add and Subtract 10 or 100 to 3 Digit Numbers	Generalize Understanding of Place Value Read and Write Multi Digit Numbers in Names and Expanded Form Multiply 4 Digit Numbers by 1 to 2 Digit Numbers Use Place Value to Understand Decimals Compare Any Multi Digit Number Round Multi Digit Numbers to Any Place Value Divide 4 Digit Numbers by 1 Digit Numbers Read, Write, and Compare Decimals to Thousandths Basic Operations with Multi Digit Numbers in Standard Algorithm Perform Basic Operations on Decimal Numbers Using Multiple Strategies Round Decimals to Any Place Divide 4 Digit Numbers by 2 Digit Numbers Using Multiple Strategies	
2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20 The Equal Sign Commutative and Associative Property of Addition Solving Addition and Subtraction Equations	Solve Addition and Subtraction Problems within 100 Solve Multiplication and Division Problems within 100 Multiplication Facts within 100 Solve 2 Step Problems or Equations Commutative and Associative Property of Multiplication Solve Multiplication and Division Equations Distributive Property of Multiplication Model Multiplication and Division within 100	Solve Multi Step Problems Using Basic Operations Interpret Multiplication as Comparison Statements Interpret the Remainder in Problems Multiples of 1 Digit Numbers Up to 100 Check Answers Using Mental Computation and Estimation Solve Problems Involving Multiplicative Comparisons Find All Factor Pairs of Any 2 Digit Whole Number Prime and Composite Numbers within 100 Write and Interpret Numerical Expressions Interpret Expressions without Evaluating Them Generate and Analyze Numeric and Geometric Patterns Identify Inexplicit Features of a Pattern from a Rule	
3. Measurement and Data	Organize, Represent, and Interpret 3 Categories of Data Indirectly Measure Lengths through Iteration	Analyze and Generate Picture Graphs and Bar Graphs Analyze and Generate Line Plots Measure and Estimate Lengths in Standard Units Solve Problems Involving Time, Volume and Mass Represent Whole Number Lengths on a Number Line Measuring and Estimating Areas of Plane Figures Solve Problems Involving Perimeter of Polygons Use Areas to Model Addition and Multiplication	Solve Problems in Length, Time, Volume, Mass and Money Including Fractions Solve Problems in Length, Time, Volume, Mass and Money Including Decimals Solve Problems Involving Information Presented in Line Plots Recognize Angles Apply Area and Perimeter Formulas for Rectangles Convert Measurements within a System Organize Unit Fraction Data (1/2, 1/4, 1/8) in a Line Plot Understand Concepts of Angle Measurement Measure and Sketch Angles in Whole Number Degrees Solve Addition and Subtraction Problems for Unknown Angles	
4. Geometry	Analyze, Compare, and Compose 3 Dimensional Shapes 2 and 3 Dimensional Composite Shapes	Analyze, Draw and Compare Shapes Having Specified Attributes Identify Common Polygons and 3 Dimensional Figures Categorize Shapes with Common Attributes Partition Shapes into Parts with Equal Areas	Draw and Identify Points, Lines, Line segments, and Rays Solve Problems by Graphing Points on the Coordinate Plane Solve Problems Involving Area, Surface Area, and Volume Draw Polygons in a Coordinate Plane Draw and Identify Angles, Perpendicular and Parallel Lines Classify 2 Dimensional Figures into Categories Based on Properties Find Areas of Polygons by Composing or Decomposing Find the Length of a Side with the Same First or Second Coordinate Represent 3 Dimensional Figures Using Nets Use Nets to Find the Surface Area of Figures	Solve Problems Involving Scale Drawings of Geometric Figures Produce Congruence and Similarity Using Models Angle Sum and Exterior Angles of Triangles and Transversals Solve Problems Involving Angle Meas., Areas, SA and Volume Recognize Congruence and Similarity from Transformations Explain and Apply the Pythagorean Theorem
5. Number and Operations: Fractions		Represent Fractions with Denominators 2, 3, 4, 6, or 8 on a Number Line Recognize Equivalent Fractions on a Number Line Use Visual Models to Represent Equivalent Fractions Compare Fractions with the Same Numerator or Denominator	Generate Equivalent Fractions Compare Fractions Using Common Numerators or Denominators Decompose Fractions as Sum of Fractions with the same Denominator Decompose Fractions as Multiples of Unit Fractions Use Models to Illustrate Equivalent Fractions Compare Fractions Using Benchmark Fractions Such as 1/2 Add and Subtract Mixed Numbers Using Equivalent Fractions Multiply Fractions by a Whole Number Multiply and Divide Fractions Solve Problems Involving Multiplication and Division of Fractions Convert Fractions with Denominators 10 or 100 to Decimals Solve Problems Involving Addition and Subtraction of Fractions	
6. Expressions and Equations			Write and Evaluate Algebraic Expressions with Exponents Identify and Generate Equivalent Algebraic Expressions Use Substitution to Determine If an Equation or Inequality is True Express One Quantity as the Dependent Variable of the Another Quantity Perform the Order of Operations on Algebraic Expressions Reason and Solve One Variable Equations and Inequalities Use Variables to Represent Two Related Quantities in a Problem Use Graphs, Tables and Equations to Show Variable Relationships	Add, Subtract, Factor, and Expand Linear Expressions Construct Equations and Inequalities to Solve Problems Apply the Properties of Exponents to Generate Equivalent Expressions Solve Problems Involving Quantities in Scientific Notation Rewrite Expressions to Show Relationships Between Quantities Solve Problems Using Algebraic Equations with Rational Coefficients Evaluate Square and Cube Roots of Perfect Squares and Cubes Graph Proportional Relationships Unit Rate as the Slope Solve Simultaneous Linear Equations in One Variable
7. The Number System			Fluently Divide Multi Digit Numbers Fluently Add, Subtract, Multiply and Divide Multi Digit Decimals Find the Greatest Common Factor of Two Numbers ≤ 100 Apply Distributive Property to Generate Equivalent Expressions Find the Least Common Multiple of Two Numbers ≤ 12 Use Models to Illustrate, Interpret and Compute Quotients of Fractions Solve Problems Involving Division of Fractions by Fractions	Use Integers to Represent Quantities in Real World Contexts Plot/Find Ordered Pairs of Rational Numbers on a Coordinate Plane Explain Statements of Order and Inequality Using a Number Line Add and Subtract Rational Numbers Using a Number Line Plot/Find Rational Numbers on a Number Line Understand and Evaluate Absolute Value of Rational Numbers Solve Problems by Graphing Multiply and Divide Rational Numbers Convert a Rational Number to Decimal Solve Problems Involving Basic Operations on Rational Numbers Find Rational Approximations of Irrational Numbers Estimate the Location of Irrational Numbers on a Number Line
8. Ratios and Proportional Relationships			Describe a Relationship Between Two Quantities Using a Ratio	Explain the Unit Rate a/b Associated with the Ratio a:b, with b ≠ 0 Use Various Techniques to Solve Problems Involving Ratios Represent Proportional Relationships by Equations and Graphs Solve Problems Involving Proportional Relationships
9. Statistics and Probability			Discuss Statistical Questions Involving Variability in Data Discuss Statistical Questions Involving Center, Spread and Overall Shape Discuss the Measure of Center and Variation for a Numerical Data Set Display Numerical Data in Plots on a Number Line: Dot Plots, Histograms, Box Plots	Relate Measures of Center and Variability to Data Distribution and Context Draw Informal Comparative Inferences About Two Populations Find or Approximate the Probability of Simple & Compound Events with Various Techniques Construct and Interpret Scatter Plots from Two Way Tables and Vice Versa Summarize and Describe Numerical Data Sets Use Interquartile Range and MAD to Draw Comparative Inferences Use Random Sampling to Draw Inferences About a Population Use the Equation of a Linear Model to Solve Problems
10. Functions				Define, Evaluate and Compare Functions Interpret the Equation y = mx + b as Defining a Linear Function Construct a Function to Model Linear Relationships Describe Qualitatively or Sketch the Functional Relationship Between Two Quantities

Plain (Grayscale) Version



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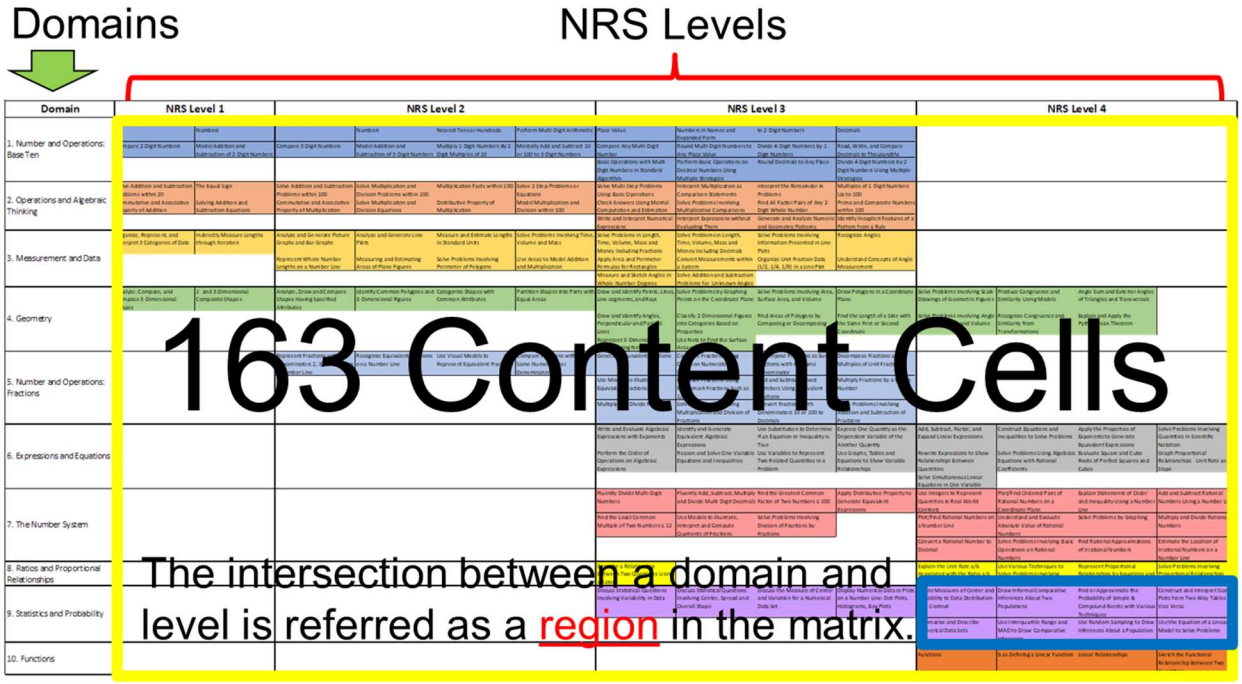
10. Functions				Define, Evaluate and Compare Functions Interpret the Equation y = mx + b as Defining a Linear Function Construct a Function to Model Linear Relationships Describe Qualitatively or Sketch the Functional Relationship Between Two Quantities

Presentation Version

Layout of the Matrix



What are NRS Levels?

NRS stands for National Reporting System. The NRS divides Adult Basic Education into 4 levels:

Level 1 – Literacy (Grade Equivalent 0 to 1)

Level 2 – Beginning Basic (Grade Equivalent 2 to 3)

Level 3 – Low Intermediate (Grade Equivalent 4 to 5)

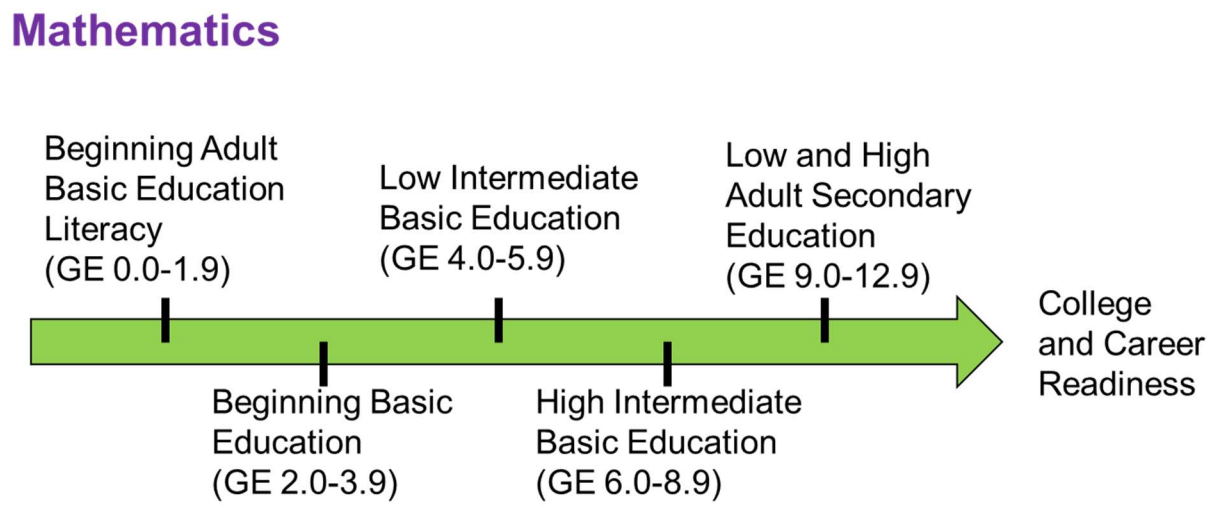
Level 4 – High Intermediate (Grade Equivalent 6 to 8)

Levels 5 and 6 are levels that belong to Adult Secondary Education (GED Prep):

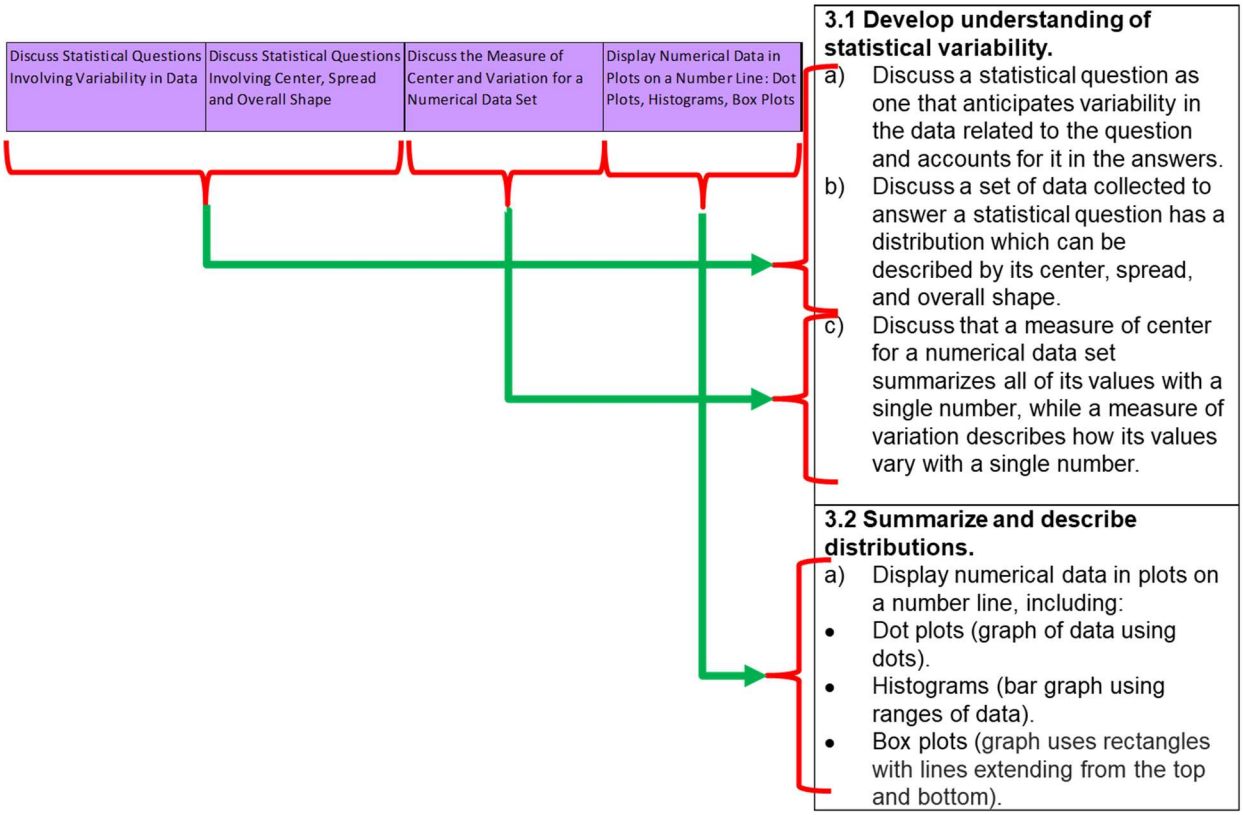
Level 5 – Low Adult Secondary Education (Grade 9 – 10)

Level 6 – High Adult Secondary Education (Grade 11 – 12)

It's a Continuum



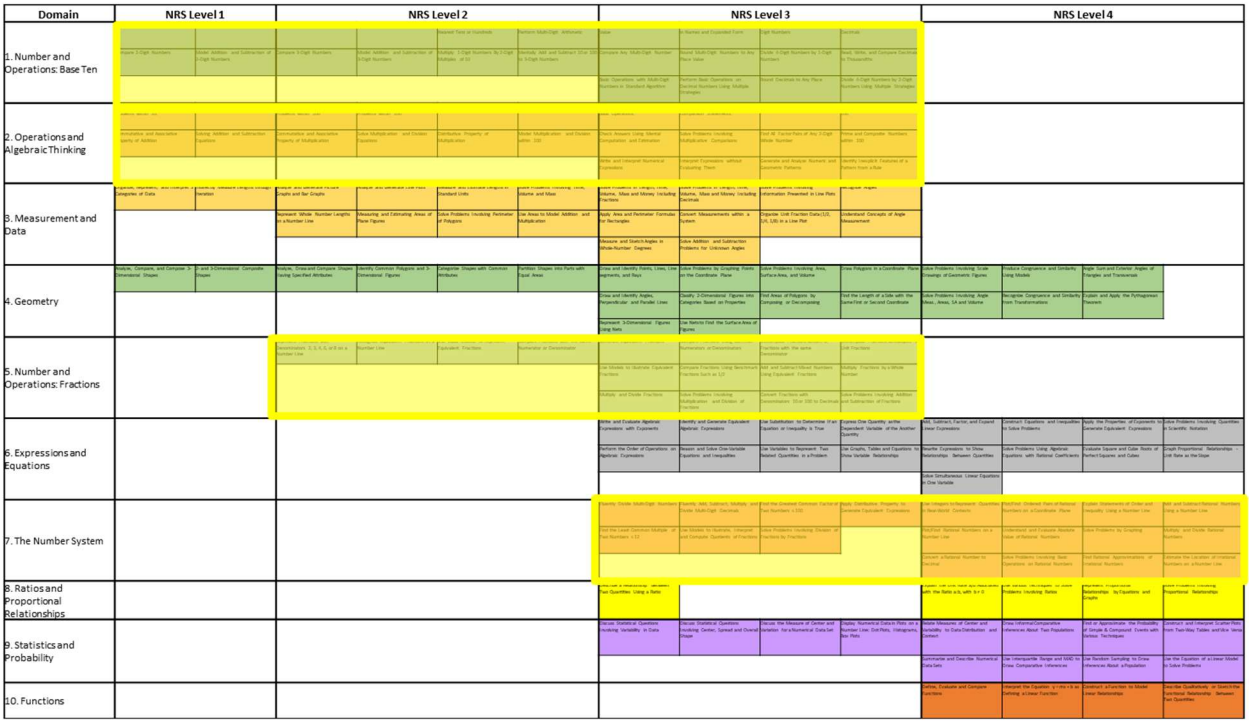
How the Matrix was Derived from the Curriculum Frameworks



The Three Components of Rigor in the Matrix

Conceptual Understanding

Procedural Fluency

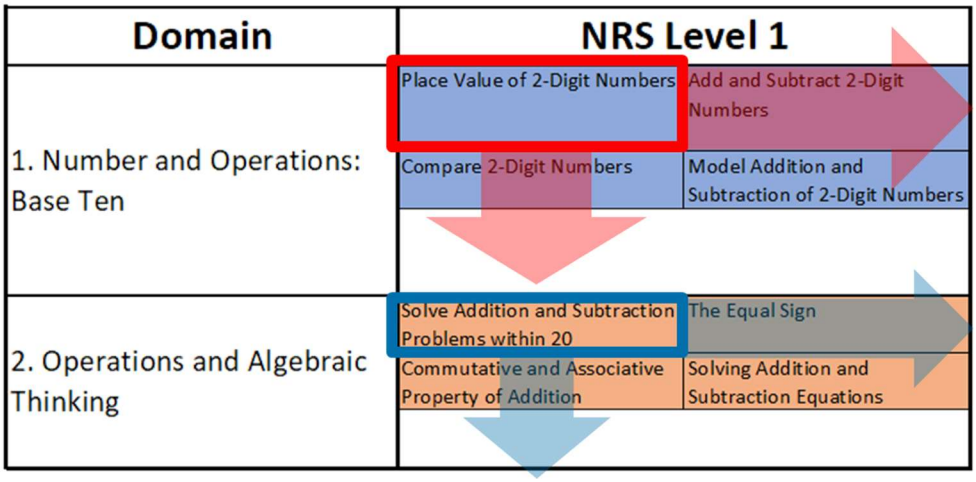


Mathematics Application

Applications of the Matrix

Instructional Planning

The matrix can be used in planning (daily, weekly, or by unit). Start with the upper leftmost content cell within each region of the matrix then teaching outwards to cover the entire region.



As teachers use the matrix in planning, point out that the starting point for every content region in the matrix is the upper leftmost content cell. In this example, after teaching "Place Value of 2-Digit Numbers," teachers may proceed to either "Adding and Subtracting 2-Digit Numbers" or "Comparing 2-Digit Numbers." The same process is suggested for other domains and regions such as Operations and Algebraic Thinking Level 1.

Pacing Guide and Progress Monitoring

The matrix can be used to track class progress or individual student's progress, which is important in adjusting the pace of the lesson and design/selection or learning materials/activities.

One use of the matrix is to track individual or group progress. Teachers can highlight or cross-out cells which students have demonstrated mastery through formative assessments. Students with similar progress can be grouped together for more effective instruction. Teachers can even use this tool to determine which material, book or online resource to use for small group activities.

In the sample matrix below, the cells in color are the objectives that students have mastered while the ones with no color are the ones that are yet to be mastered.

Domain	NRS Level 1		NRS Level 2				NRS Level 3			
1. Number and Operations: Base Ten	Place Value of 2 Digit Numbers	Add and Subtract 2 Digit Numbers	Place Value of 3 Digit Numbers	Add and Subtract 3 Digit Numbers	Round Whole Numbers to the Nearest Ten or Hundreds	Use Properties of Operations to Perform Multi-Digit Arithmetic	Generalize Understanding of Place Value	Read and Write Multi-Digit Numbers in Names and Expanded Form	Multiply 4 Digit Numbers by 1 to 2 Digit Numbers	Use Place Value to Understand Decimals
	Compare 2 Digit Numbers	Model Addition and Subtraction of 2 Digit Numbers	Compare 3 Digit Numbers	Model Addition and Subtraction of 3 Digit Numbers	Multiply 1 Digit Numbers By 2 Digit Multiples of 10	Mentally Add and Subtract 10 or 100 to 3 Digit Numbers	Compare Any Multi-Digit Number Basic Operations with Multi-Digit Numbers in Standard Algorithm	Round Multi Digit Numbers to Any Place Value Perform Basic Operations on Decimal Numbers Using Multiple Strategies	Divide 4 Digit Numbers by 1 Digit Numbers Round Decimals to Any Place	Read, Write, and Compare Decimals to Thousandths Divide 4 Digit Numbers by 2 Digit Numbers Using Multiple Strategies
2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20	The Equal Sign	Solve Addition and Subtraction Problems within 100	Solve Multiplication and Division Problems within 100	Multiplication Facts within 100	Solve 2 Step Problems or Equations	Solve Multi Step Problems Using Basic Operations	Interpret Multiplication as Comparison Statements	Interpret the Remainder in Problems	Multiples of 1 Digit Numbers Up to 100
	Commutative and Associative Property of Addition	Solving Addition and Subtraction Equations	Commutative and Associative Property of Multiplication	Solve Multiplication and Division Equations	Distributive Property of Multiplication	Model Multiplication and Division within 100	Check Answers Using Mental Computation and Estimation	Solve Problems Involving Multiplicative Comparisons	Find All Factor Pairs of Any 2 Digit Whole Number	Prime and Composite Numbers within 100
							Write and Interpret Numerical Expressions	Interpret Expressions without Evaluating Them	Generate and Analyze Numeric and Geometric Patterns	Identify Implicit Features of a Pattern from a Rule
3. Measurement and Data	Organize, Represent, and Interpret 3 Categories of Data	Indirectly Measure Lengths through Iteration	Analyze and Generate Picture Graphs and Bar Graphs	Analyze and Generate Line Plots	Measure and Estimate Lengths in Standard Units	Solve Problems Involving Time, Volume and Mass	Solve Problems in Length, Time, Volume, Mass and Money including Fractions	Solve Problems in Length, Time, Volume, Mass and Money including Decimals	Solve Problems Involving Information Presented in Line Plots	Recognize Angles
			Represent Whole Number Lengths on a Number Line	Measuring and Estimating Areas of Plane Figures	Solve Problems Involving Perimeter of Polygons	Use Areas to Model Addition and Multiplication	Apply Area and Perimeter Formulas to Rectangles	Convert Measurements within 1 System	Organize Unit Fraction Data (1/2, 1/4, 1/8) in a Line Plot	Understand Concepts of Angle Measurement
							Measure and Sketch Angles in Whole Number Degrees	Solve Addition and Subtraction Problems for Unknown Angles		
4. Geometry	Analyze, Compare, and Compose 3 Dimensional Shapes	2 and 3 Dimensional Composite Shapes	Analyze, Draw and Compare Shapes Having Specified Attributes	Identify Common Polygons and 3 Dimensional Figures	Categorize Shapes with Common Attributes	Partition Shapes into Parts with Equal Areas	Draw and Identify Points, Lines, Line segments, and Rays	Solve Problems by Graphing Points on the Coordinate Plane	Solve Problems Involving Area, Surface Area, and Volume	Draw Polygons in a Coordinate Plane
							Draw and Identify Angles, Perpendicular and Parallel Lines	Classify 2 Dimensional Figures into Categories Based on Properties	Find Areas of Polygons by Composing or Decomposing	Find the Length of a Side with the Same First or Second Coordinate
							Represent 3 Dimensional Figures Using Nets	Use Nets to Find the Surface Area of Figures		
5. Number and Operations: Fractions			Represent Fractions with Denominators 2, 3, 4, 6, or 8 on a Number Line	Recognize Equivalent Fractions on a Number Line	Use Visual Models to Represent Equivalent Fractions	Compare Fractions with the Same Numerator or Denominator	Generate Equivalent Fractions Use Models to Illustrate Equivalent Fractions Multiply and Divide Fractions	Compare Fractions Using Common Numerators or Denominators Compare Fractions Using Benchmark Fractions Such as 1/2 Solve Problems Involving Multiplication and Division of Fractions	Decompose Fractions as Sum of Fractions with the same Denominator Add and Subtract Mixed Numbers Using Equivalent Fractions Convert Fractions with Denominators of 10 or 100 to Decimals	Decompose Fractions as Multiples of Unit Fractions Multiply Fractions by a Whole Number Solve Problems Involving Addition and Subtraction of Fractions
6. Expressions and Equations							Write and Evaluate Algebraic Expressions with Exponents	Identify and Generate Equivalent Algebraic Expressions	Use Substitution to Determine if an Equation or Inequality is True	Express One Quantity as the Dependent Variable of the Another Quantity
							Perform the Order of Operations on Algebraic Expressions	Reason and Solve One Variable Equations and Inequalities	Use Variables to Represent Two Related Quantities in a Problem	Use Graphs, Tables and Equations to Show Variable Relationships
7. The Number System							Fluently Divide Multi-Digit Numbers Find the Least Common Multiple of Two Numbers ≤ 12	Fluently Add, Subtract, Multiply and Divide Multi-Digit Decimals Use Models to Illustrate, Interpret and Compute Quotients of Fractions	Find the Greatest Common Factor of Two Numbers ≤ 100 Solve Problems Involving Division of Fractions by Fractions	Apply Distributive Property to Generate Equivalent Expressions

Learning Profiles

The matrix can be used together with standardized or formative test results to map students strong and weak areas which could lead to developing class, small group or individual student learning profiles.

This sample matrix below show's a student's learning profile. This is a sample profile of a student that is struggling with area models and fractions. Seeing this map will help the teacher develop lessons, provide remediation, select appropriate materials/activities and implement alternative instructional strategies that would address students' weaker skills.

Class learning profiles may also be generated for objectives that meet a certain percentage of class mastery. If the image above is a class profile, this shows areas where majority of the students show strength and where majority of the students show weakness. Teachers can then decide which areas in red to remediate or spend more time on.

Domain	NRS Level 1		NRS Level 2				NRS Level 3			
1. Number and Operations: Base Ten	Place Value of 2-Digit Numbers	Add and Subtract 2-Digit Numbers	Place Value of 3-Digit Numbers	Add and Subtract 3-Digit Numbers	Round Whole Numbers to the Nearest Tens or Hundreds	Use Properties of Operations to Perform Multi-Digit Arithmetic	Generalize Understanding of Place Value	Read and Write Multi-Digit Numbers in Names and Expanded Form	Multiply 4-Digit Numbers by 1- to 2-Digit Numbers	Use Place Value to Understand Decimals
	Compare 2-Digit Numbers	Model Addition and Subtraction of 2-Digit Numbers	Compare 3-Digit Numbers	Model Addition and Subtraction of 3-Digit Numbers	Multiply 1-Digit Numbers By 2-Digit Multiples of 10	Mentally Add and Subtract 10 or 100 to 3-Digit Numbers	Compare Any Multi-Digit Number	Round Multi-Digit Numbers to Any Place Value	Divide 4-Digit Numbers by 1-Digit Numbers	Read, Write, and Compare Decimals to Thousandths
							Basic Operations with Multi-Digit Numbers in Standard Algorithm	Perform Basic Operations on Decimal Numbers Using Multiple Strategies	Round Decimals to Any Place	Divide 4-Digit Numbers by 2-Digit Numbers Using Multiple Strategies
2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20	The Equal Sign	Solve Addition and Subtraction Problems within 100	Solve Multiplication and Division Problems within 100	Multiplication Facts within 100	Solve 2-Step Problems or Equations	Solve Multi-Step Problems Using Basic Operations	Interpret Multiplication as Comparison Statements	Interpret the Remainder in Problems	Multiples of 1-Digit Numbers Up to 100
	Commutative and Associative Property of Addition	Solving Addition and Subtraction Equations	Commutative and Associative Property of Multiplication	Solve Multiplication and Division Equations	Distributive Property of Multiplication	Model Multiplication and Division within 100	Check Answers Using Mental Computation and Estimation	Solve Problems Involving Multiplicative Comparisons	Find All Factor Pairs of Any 2-Digit Whole Number	Prime and Composite Numbers within 100
							Write and Interpret Numerical Expressions	Interpret Expressions without Evaluating Them	Generate and Analyze Numeric and Geometric Patterns	Identify Inexplicit Features of a Pattern from a Rule
3. Measurement and Data	Organize, Represent, and Interpret 3 Categories of Data	Indirectly Measure Lengths through Iteration	Analyze and Generate Picture Graphs and Bar Graphs	Analyze and Generate Line Plots	Measure and Estimate Lengths in Standard Units	Solve Problems Involving Time, Volume and Mass	Solve Problems in Length, Time, Volume, Mass and Money Including Fractions	Solve Problems in Length, Time, Volume, Mass and Money Including Decimals	Solve Problems Involving Information Presented in Line Plots	Recognize Angles
			Represent Whole Number Lengths on a Number Line	Measuring and Estimating Areas of Plane Figures	Solve Problems Involving Perimeter of Polygons	Use Areas to Model Addition and Multiplication	Apply Area and Perimeter Formulas for Rectangles	Convert Measurements within a System	Organize Unit Fraction Data (1/2, 1/4, 1/8) in a Line Plot	Understand Concepts of Angle Measurement
							Measure and Sketch Angles in Whole-Number Degrees	Solve Addition and Subtraction Problems for Unknown Angles		
4. Geometry	Analyze, Compare, and Compose 3-Dimensional Shapes	2- and 3-Dimensional Composite Shapes	Analyze, Draw and Compare Shapes Having Specified Attributes	Identify Common Polygons and 3-Dimensional Figures	Categorize Shapes with Common Attributes	Partition Shapes into Parts with Equal Areas	Draw and Identify Points, Lines, Line segments, and Rays	Solve Problems by Graphing Points on the Coordinate Plane	Solve Problems Involving Area, Surface Area, and Volume	Draw Polygons in a Coordinate Plane
							Draw and Identify Angles, Perpendicular and Parallel Lines	Classify 2-Dimensional Figures into Categories Based on Properties	Find Areas of Polygons by Composing or Decomposing	Find the Length of a Side with the Same First or Second Coordinate
							Represent 3-Dimensional Figures Using Nets	Use Nets to Find the Surface Area of Figures		
5. Number and Operations: Fractions			Represent Fractions with Denominators 2, 3, 4, 6, or 8 on a Number Line	Recognize Equivalent Fractions on a Number Line	Use Visual Models to Represent Equivalent Fractions	Compare Fractions with the Same Numerator or Denominator	Generate Equivalent Fractions	Compare Fractions Using Common Numerators or Denominators	Decompose Fractions as Sum of Fractions with the same Denominator	Decompose Fractions as Multiples of Unit Fractions
							Use Models to Illustrate Equivalent Fractions	Compare Fractions Using Benchmark Fractions Such as 1/2	Add and Subtract Mixed Numbers Using Equivalent Fractions	Multiply Fractions by a Whole Number
							Multiply and Divide Fractions	Solve Problems Involving Multiplication and Division of Fractions	Convert Fractions with Denominators 10 or 100 to Decimals	Solve Problems Involving Addition and Subtraction of Fractions

Student Checklists

As individual students or groups of students start demonstrating mastery of skills in red, teachers/students can start marking through the red cells where students have successfully demonstrated mastery. Teachers/students can also use the Plain (Grayscale) Version of the matrix which is more readable. See sample matrix on the next page.

Domain	NRS Level 1		NRS Level 2				NRS Level 3			
1. Number and Operations: Base Ten	Place Value of 2-Digit Numbers	Add and Subtract 2-Digit Numbers	Place Value of 3-Digit Numbers	Add and Subtract 3-Digit Numbers	Round Whole Numbers to the Nearest Tens or Hundreds	Use Properties of Operations to Perform Multi-Digit Arithmetic	Generalize Understanding of Place Value	Read and Write Multi-Digit Numbers in Names and Expanded Form	Multiply 4-Digit Numbers by 1-to 2-Digit Numbers	Use Place Value to Understand Decimals
	Compare 2-Digit Numbers	Model Addition and Subtraction of 2-Digit Numbers	Compare 3-Digit Numbers	Model Addition and Subtraction of 3-Digit Numbers	Multiply 1-Digit Numbers By 2-Digit Multiples of 10	Mentally Add and Subtract 10 or 100 to 3-Digit Numbers	Compare Any Multi-Digit Number	Round Multi-Digit Numbers to Any Place Value	Divide 4-Digit Numbers by 1-Digit Numbers	Read, Write, and Compare Decimals to Thousandths
							Basic Operations with Multi-Digit Numbers in Standard Algorithm	Perform Basic Operations on Decimal Numbers Using Multiple Strategies	Round Decimals to Any Place	Divide 4-Digit Numbers by 2-Digit Numbers Using Multiple Strategies
2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20	The Equal Sign	Solve Addition and Subtraction Problems within 100	Solve Multiplication and Division Problems within 100	Multiplication Facts within 100	Solve 2-Step Problems or Equations	Solve Multi-Step Problems Using Basic Operations	Interpret Multiplication as Comparison Statements	Interpret the Remainder in Problems	Multiples of 1-Digit Numbers Up to 100
	Commutative and Associative Property of Addition	Solving Addition and Subtraction Equations	Commutative and Associative Property of Multiplication	Relate Multiplication and Division Equations	Distributive Property of Multiplication	Model Multiplication and Division within 100	Check Answers Using Mental Computation and Estimation	Solve Problems Involving Multiplicative Comparisons	Find All Factor Pairs of Any 2-Digit Whole Number	Prime and Composite Numbers within 100
							Write and Interpret Numerical Expressions	Interpret Expressions without Evaluating Them	Generate and Analyze Numeric and Geometric Patterns	Identify Inexplicit Features of a Pattern from a Rule
3. Measurement and Data	Organize, Represent, and Interpret 3 Categories of Data	Indirectly Measure Lengths through Iteration	Analyze and Generate Picture Graphs and Bar Graphs	Analyze and Generate Line Plots	Measure and Estimate Lengths in Standard Units	Solve Problems Involving Time, Volume and Mass	Solve Problems in Length, Time, Volume, Mass and Money Including Fractions	Solve Problems in Length, Time, Volume, Mass and Money Including Decimals	Solve Problems Involving Information Presented in Line Plots	Recognize Angles
			Represent Whole Number Lengths on a Number Line	Measuring and Estimating Area of Plane Figures	Solve Problems Involving Perimeter of Polygons	Use Areas to Model Addition and Multiplication	Apply Area and Perimeter Formulas for Rectangles	Convert Measurements within a System	Organize Unit Fraction Data (1/2, 1/4, 1/8) in a Line Plot	Understand Concepts of Angle Measurement
							Measure and Sketch Angles in Whole-Number Degrees	Solve Addition and Subtraction Problems for Unknown Angles		
4. Geometry	Analyze, Compare, and Compose 3-Dimensional Shapes	2- and 3-Dimensional Composite Shapes	Analyze, Draw and Compare Shapes Having Specified Attributes	Identify Common Polygons and 3-Dimensional Figures	Categorize Shapes with Common Attributes	Partition Shapes into Parts with Equal Areas	Draw and Identify Points, Lines, Line segments, and Rays	Solve Problems by Graphing Points on the Coordinate Plane	Solve Problems Involving Area, Surface Area, and Volume	Draw Polygons in a Coordinate Plane
							Draw and Identify Angles, Perpendicular and Parallel Lines	Classify 2-Dimensional Figures into Categories Based on Properties	Find Areas of Polygons by Composing or Decomposing	Find the Length of a Side with the Same First or Second Coordinate
							Represent 3-Dimensional Figures Using Nets	Use Nets to Find the Surface Area of Figures		
5. Number and Operations: Fractions			Represent Fractions with Denominators 2, 3, 4, 6, or 8 on a Number Line	Recognize Equivalent Fractions on a Number Line	Use Visual Models to Represent Equivalent Fractions	Compare Fractions with the Same Numerator or Denominator	Generate Equivalent Fractions	Compare Fractions Using Common Numerators or Denominators	Decompose Fractions as Sum of Fractions with the same Denominator	Decompose Fractions as Multiples of Unit Fractions
							Use Models to Illustrate Equivalent Fractions	Compare Fractions Using Benchmark Fractions Such as 1/2	Add and Subtract Mixed Numbers Using Equivalent Fractions	Multiply Fractions by a Whole Number
							Multiply and Divide Fractions	Solve Problems Involving Multiplication and Division of Fractions	Convert Fractions with Denominators 10 or 100 to Decimals	Solve Problems Involving Addition and Subtraction of Fractions

Learning Trajectories

A learning trajectory is generally defined as a content-specific learning path, a developmental progression, and/or a building of conceptual components.

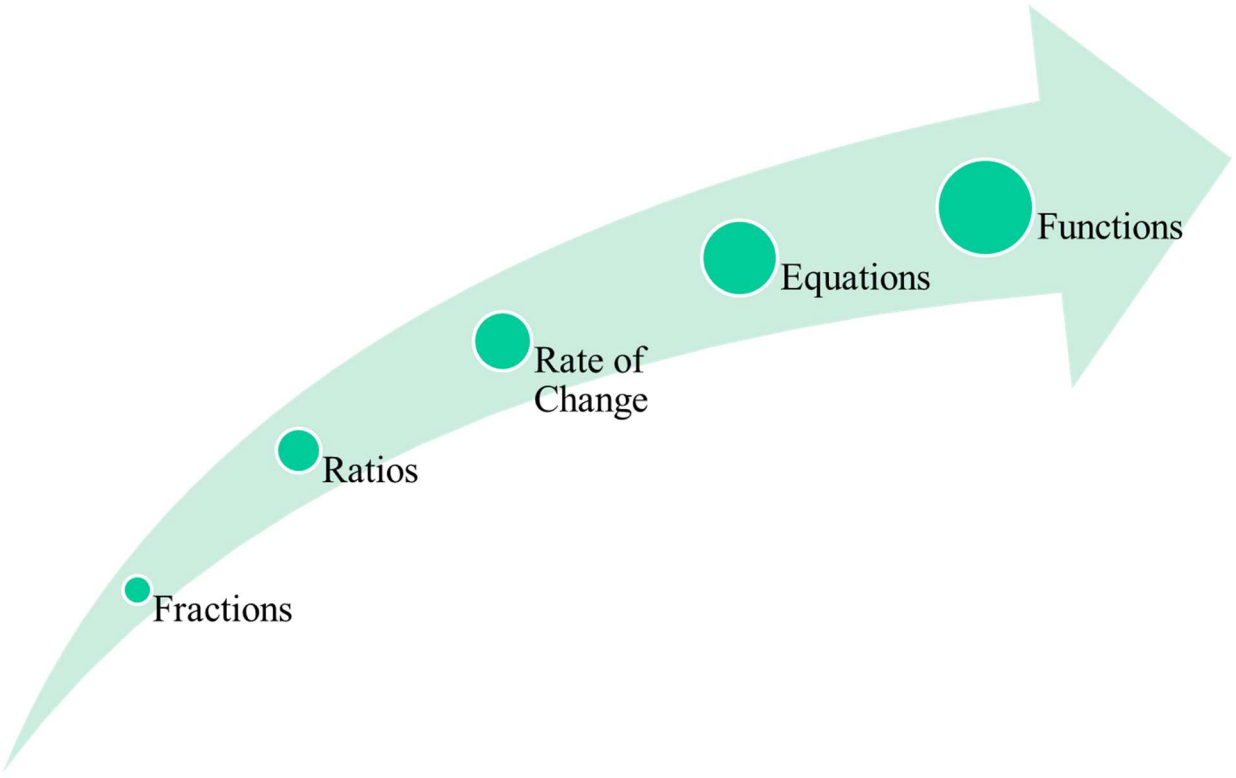
- G. Mojica (2011). A trajectory toward understanding. University of North Carolina - Chapel Hill, School of Education, NC.

  http://thewell.web.unc.edu/2011/10/31/trajectory-toward-understanding/

Example:

It would be most helpful for students to understand why students need to spend so much time learning fractions (and operations). It provides the building blocks for constructing equations and functions. As students learn how functions behave, they are also starting to learn the properties of ratios. As students compare quantities using ratios, students are also learning how to write them in terms of rates of change. Although equations may be thought as something completely separate from rates of change; for some equations like linear equations, in the form y = mx + b, the rate of change or more commonly known as slope (m) is the most important part. For linear equations, the rate of change determines how steep the line rises from left to right. As students study linear equations, they are also studying the first and easiest type of function which is the linear function.

The next page shows a graphic image of this learning trajectory.



Learning trajectories help emphasize the big ideas in mathematics such as functions and equations.

Below is a sample matrix showing a learning trajectory for Single Step Equations.

Domain	NRS Level 1		NRS Level 2				NRS Level 3			
1. Number and Operations: Base Ten	Place Value of 2-Digit Numbers	Add and Subtract 2-Digit Numbers	Place Value of 3-Digit Numbers	Add and Subtract 3-Digit Numbers	Round Whole Numbers to the Nearest Tens or Hundreds	Use Properties of Operations to Perform Multi-Digit Arithmetic	Generalize Understanding of Place Value	Read and Write Multi-Digit Numbers in Names and Expanded Form	Multiply 4-Digit Numbers by 1-to 2-Digit Numbers	Use Place Value to Understand Decimals
	Compare 2-Digit Numbers	Model Addition and Subtraction of 2-Digit Numbers	Compare 3-Digit Numbers	Model Addition and Subtraction of 3-Digit Numbers	Multiply 1-Digit Numbers By 2-Digit Multiples of 10	Mentally Add and Subtract 10 or 100 to 3-Digit Numbers	Compare Any Multi-Digit Number	Round Multi-Digit Numbers to Any Place Value	Divide 4-Digit Numbers by 1-Digit Numbers	Read, Write, and Compare Decimals to Thousandths
							Basic Operations with Multi-Digit Numbers in Standard Algorithm	Perform Basic Operations on Decimal Numbers Using Multiple Strategies	Round Decimals to Any Place	Divide 4-Digit Numbers by 2-Digit Numbers Using Multiple Strategies
2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20	The Equal Sign	Solve Addition and Subtraction Problems within 100	Solve Multiplication and Division Problems within 100	Multiplication Facts within 100	Solve 2-Step Problems or Equations	Solve Multi-Step Problems Using Basic Operations	Interpret Multiplication as Comparison Statements	Interpret the Remainder in Problems	Multiples of 1-Digit Numbers Up to 100
	Commutative and Associative Property of Addition	Solving Addition and Subtraction Equations	Commutative and Associative Property of Multiplication	Solve Multiplication and Division Equations	Distributive Property of Multiplication	Model Multiplication and Division within 100	Check Answers Using Mental Computation and Estimation	Solve Problems Involving Multiplicative Comparisons	Find All Factor Pairs of Any 2-Digit Whole Number	Prime and Composite Numbers within 100
							Write and Interpret Numerical Expressions	Interpret Expressions without Evaluating Them	Generate and Analyze Numeric and Geometric Patterns	Identify Inexplicit Features of a Pattern from a Rule
3. Measurement and Data	Organize, Represent, and Interpret 3 Categories of Data	Indirectly Measure Lengths through Iteration	Analyze and Generate Picture Graphs and Bar Graphs	Analyze and Generate Line Plots	Measure and Estimate Lengths in Standard Units	Solve Problems Involving Time, Volume and Mass	Solve Problems in Length, Time, Volume, Mass and Money Including Fractions	Solve Problems in Length, Time, Volume, Mass and Money Including Decimals	Solve Problems Involving Information Presented in Line Plots	Recognize Angles
			Represent Whole Number Lengths on a Number Line	Measuring and Estimating Areas of Plane Figures	Solve Problems Involving Perimeter of Polygons	Use Areas to Model Addition and Multiplication	Apply Area and Perimeter Formulas for Rectangles	Convert Measurements within a System	Organize Unit Fraction Data (1/2, 1/4, 1/8) in a Line Plot	Understand Concepts of Angle Measurement
							Measure and Sketch Angles in Whole-Number Degrees	Solve Addition and Subtraction Problems for Unknown Angles		
4. Geometry	Analyze, Compare, and Compose 3-Dimensional Shapes	2- and 3-Dimensional Composite Shapes	Analyze, Draw and Compare Shapes Having Specified Attributes	Identify Common Polygons and 3-Dimensional Figures	Categorize Shapes with Common Attributes	Partition Shapes into Parts with Equal Areas	Draw and Identify Points, Lines, Line segments, and Rays	Solve Problems by Graphing Points on the Coordinate Plane	Solve Problems Involving Area, Surface Area, and Volume	Draw Polygons in a Coordinate Plane
							Draw and Identify Angles, Perpendicular and Parallel Lines	Classify 2-Dimensional Figures into Categories Based on Properties	Find Areas of Polygons by Composing or Decomposing	Find the Length of a Side with the Same First or Second Coordinate
							Represent 3-Dimensional Figures Using Nets	Use Nets to Find the Surface Area of Figures		
5. Number and Operations: Fractions			Represent Fractions with Denominators 2, 3, 4, 6, or 8 on a Number Line	Recognize Equivalent Fractions on a Number Line	Use Visual Models to Represent Equivalent Fractions	Compare Fractions with the Same Numerator or Denominator	Generate Equivalent Fractions	Compare Fractions Using Common Numerators or Denominators	Decompose Fractions as Sum of Fractions with the same Denominator	Decompose Fractions as Multiples of Unit Fractions
							Use Models to Illustrate Equivalent Fractions	Compare Fractions Using Benchmark Fractions Such as 1/2	Add and Subtract Mixed Numbers Using Equivalent Fractions	Multiply Fractions by a Whole Number
							Multiply and Divide Fractions	Solve Problems Involving Multiplication and Division of Fractions	Convert Fractions with Denominators 10 or 100 to Decimals	Solve Problems Involving Addition and Subtraction of Fractions
6. Expressions and Equations							Write and Evaluate Algebraic Expressions with Exponents	Identify and Generate Equivalent Algebraic Expressions	Use Substitution to Determine If an Equation or Inequality Is True	Express One Quantity as the Dependent Variable of the Another Quantity
							Perform the Order of Operations on Algebraic Expressions	Reason and Solve One-Variable Equations and Inequalities	Use Variables to Represent Two Related Quantities in a Problem	Use Graphs, Tables and Equations to Show Variable Relationships
7. The Number System							Fluently Divide Multi-Digit Numbers	Fluently Add, Subtract, Multiply and Divide Multi-Digit Decimals	Find the Greatest Common Factor of Two Numbers ≤ 100	Apply Distributive Property to Generate Equivalent Expressions
							Find the Least Common Multiple of Two Numbers ≤ 12	Use Models to Illustrate, Interpret and Compute Quotients of Fractions	Solve Problems Involving Division of Fractions by Fractions	

Mapping High Impact Indicators

High Impact Indicators are skills/objectives that are useful for educators to emphasize in the classroom because they are essential for students in order to perform well on the GED Test.

- They represent particular foundational skills that are the basis for the development of other skills covered in the GED® Assessment Targets and have broad usefulness that can be applied in multiple contexts.
- They are a good fit for classroom instruction because they are not complicated but are important for students to know and use.
- GED® testing data suggests that educators may not be currently focusing on these skills in their GED® test preparation.

Teachers can use the matrix to develop a mapping of the foundational skills leading to each GED High Impact Indicator. Below is a sample matrix mapping the content skills needed to achieve Q4 and Q5 High Impact Indicators.

Q.4: Calculate dimensions, perimeter, circumference, and area of two-dimensional figures

Q.5: Calculate dimensions, surface area, and volume of three-dimensional figures

Domain	NRS Level 1		NRS Level 2				NRS Level 3			
1. Number and Operations: Base Ten	Place Value of 2-Digit Numbers	Add and Subtract 2-Digit Numbers	Place Value of 3-Digit Numbers	Add and Subtract 3-Digit Numbers	Round Whole Numbers to the Nearest Tens or Hundreds	Use Properties of Operations to Perform Multi-Digit Arithmetic	Generalize Understanding of Place Value	Read and Write Multi-Digit Numbers in Names and Expanded Form	Multiply 4-Digit Numbers by 1- to 2-Digit Numbers	Use Place Value to Understand Decimals
	Compare 2-Digit Numbers	Model Addition and Subtraction of 2-Digit Numbers	Compare 3-Digit Numbers	Model Addition and Subtraction of 3-Digit Numbers	Multiply 1-Digit Numbers By 2-Digit Multiples of 10	Mentally Add and Subtract 10 or 100 to 3-Digit Numbers	Compare Any Multi-Digit Number	Round Multi-Digit Numbers to Any Place Value	Divide 4-Digit Numbers by 1-Digit Numbers	Read, Write, and Compare Decimals to Thousandths
							Basic Operations with Multi-Digit Numbers in Standard Algorithm	Perform Basic Operations on Decimal Numbers Using Multiple Strategies	Round Decimals to Any Place	Divide 4-Digit Numbers by 2-Digit Numbers Using Multiple Strategies
2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20	The Equal Sign	Solve Addition and Subtraction Problems within 100	Solve Multiplication and Division Problems within 100	Multiplication Facts within 100	Solve 2-Step Problems or Equations	Solve Multi-Step Problems Using Basic Operations	Interpret Multiplication as Comparison Statements	Interpret the Remainder in Problems	Multiples of 1-Digit Numbers Up to 100
	Commutative and Associative Property of Addition	Solving Addition and Subtraction Equations	Commutative and Associative Property of Multiplication	Solve Multiplication and Division Equations	Distributive Property of Multiplication	Model Multiplication and Division within 100	Check Answers Using Mental Computation and Estimation	Solve Problems Involving Multiplicative Comparisons	Find All Factor Pairs of Any 2-Digit Whole Number	Prime and Composite Numbers within 100
							Write and Interpret Numerical Expressions	Interpret Expressions without Evaluating Them	Generate and Analyze Numeric and Geometric Patterns	Identify Inexplicit Features of a Pattern from a Rule
3. Measurement and Data	Organize, Represent, and Interpret 3 Categories of Data	Indirectly Measure Lengths through Iteration	Analyze and Generate Picture Graphs and Bar Graphs	Analyze and Generate Line Plots	Measure and Estimate Lengths in Standard Units	Solve Problems Involving Time, Volume and Mass	Solve Problems in Length, Time, Volume, Mass and Money including Fractions	Solve Problems in Length, Time, Volume, Mass and Money including Decimals	Solve Problems Involving Information Presented in Line Plots	Recognize Angles
			Represent Whole Number Lengths on a Number Line	Measuring and Estimating Areas of Plane Figures	Solve Problems Involving Perimeter of Polygons	Use Areas to Model Addition and Multiplication	Apply Area and Perimeter Formulas for Rectangles	Convert Measurements within a System	Organize Unit Fraction Data (1/2, 1/4, 1/8) in a Line Plot	Understand Concepts of Angle Measurement
							Measure and Sketch Angles in Whole-Number Degrees	Solve Addition and Subtraction Problems for Unknown Angles		
4. Geometry	Analyze, Compare, and Compose 3-Dimensional Shapes	2- and 3-Dimensional Composite Shapes	Analyze, Draw and Compare Shapes Having Specified Attributes	Identify Common Polygons and 3-Dimensional Figures	Categorize Shapes with Common Attributes	Partition Shapes into Parts with Equal Areas	Draw and Identify Points, Lines, Line segments, and Rays	Solve Problems by Graphing Points on the Coordinate Plane	Solve Problems Involving Area, Surface Area, and Volume	Draw Polygons in a Coordinate Plane
							Draw and Identify Angles, Perpendicular and Parallel Lines	Classify 2-Dimensional Figures into Categories Based on Properties	Find Areas of Polygons by Composing or Decomposing	Find the Length of a Side with the Same First or Second Coordinate
							Represent 3-Dimensional Figures Using Nets	Use Nets to Find the Surface Area of Figures		

Benefits to the Teachers and/or Students

- Summarizes the ABE math standards in a more visual representation
- Shows an overall picture of the ABE math standards
- Shows the logical grouping and possible sequencing of the standards
- Emphasizes out how each standards relate to one another

- Organizes the standards in ABE levels across conceptual categories/domains
- Shows how much content/objectives are covered at each ABE level or domain
- Serves as a quick guide for teachers so that they are able to prioritize and differentiate teaching to the most important skills to adult students based on the student's ability, curriculum and standardized assessment.
- Enumerates every skill/concept/topic that has to be covered in the ABE Math Classroom.
- Highlights every standard that is tested in standardized assessments such as the TABE 11 & 12.

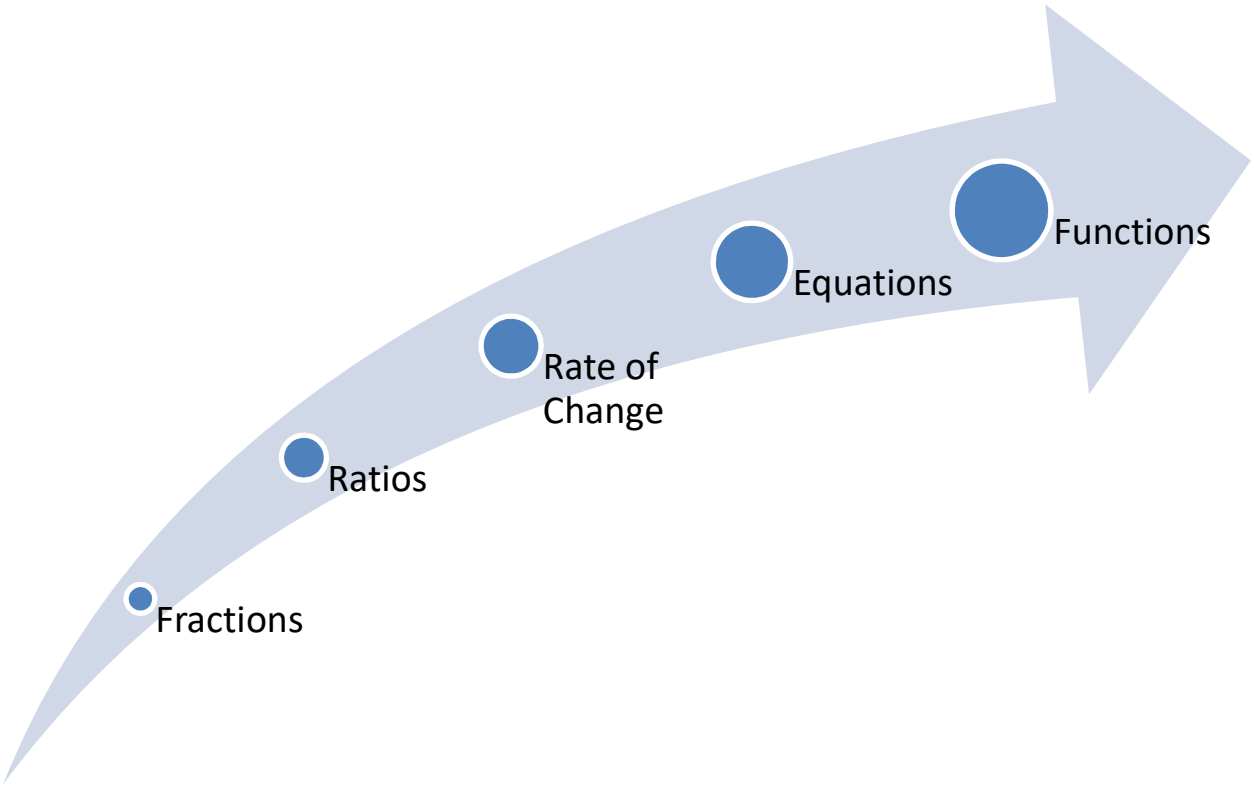
Activity:

Using a section of the ABE Mathematics Curriculum Matrix below, in what sequence would you teach these topics? Explain.

Domain	NRS Level 1	
1. Number and Operations: Base Ten	Place Value of 2-Digit Numbers	Add and Subtract 2-Digit Numbers
	Compare 2-Digit Numbers	Model Addition and Subtraction of 2-Digit Numbers
2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20	The Equal Sign
	Commutative and Associative Property of Addition	Solving Addition and Subtraction Equations

Use the section below to answer the question.

Learning Trajectories



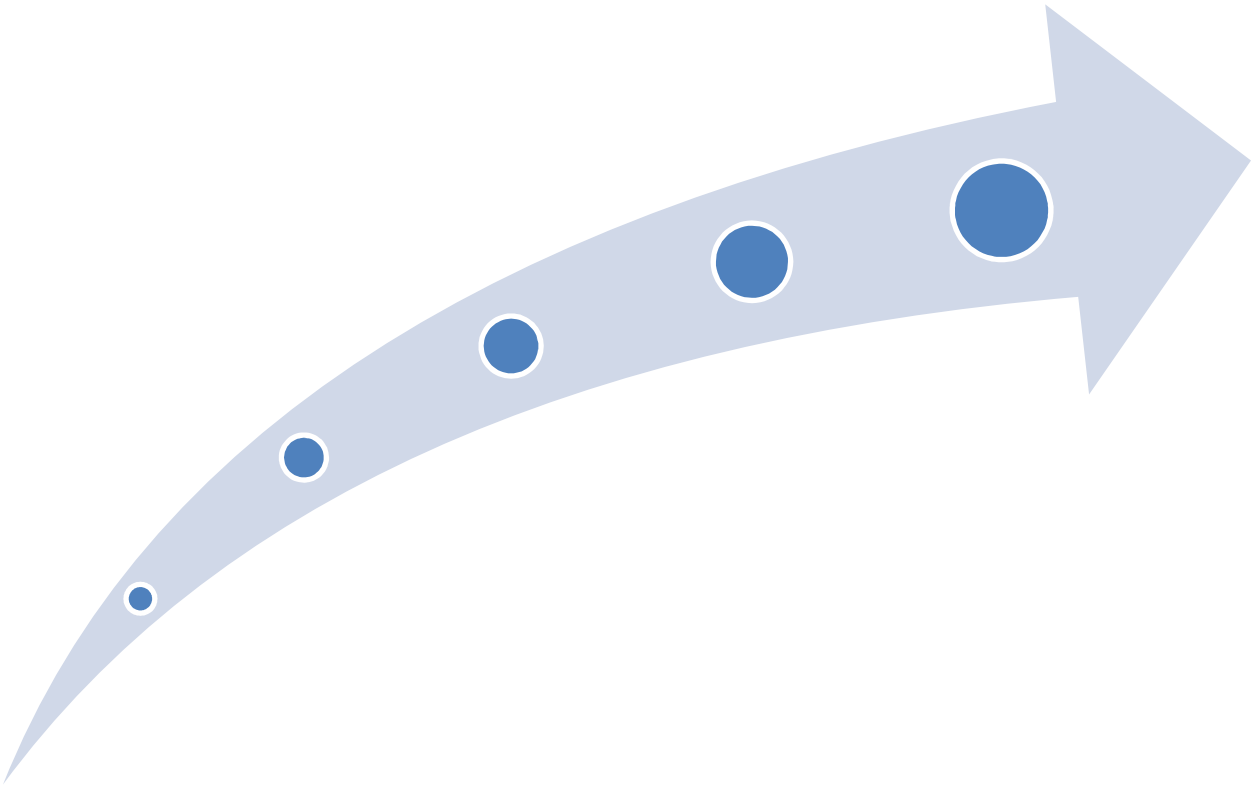
Question:

What is a learning trajectory?

_____
_____
_____
_____
_____

Activity:

Use the ABE Mathematics Curriculum Matrix to identify another learning trajectory. Label the diagram below with the sequential topics. You may add additional bullets if you need more to complete your learning trajectory.



Questions:

What are High Impact Indicators?

_____
_____
_____
_____
_____

Why is it important for teachers to teach these High Impact Indicators?

_____
_____
_____
_____
_____

Aligning with the TABE 11 & 12 Level E Mathematics Blueprint

Domain	NRS Level 1		NRS Level 2			
1. Number and Operations: Base Ten	Place Value of 2-Digit Numbers	Add and Subtract 2-Digit Numbers	Place Value of 3-Digit Numbers	Add and Subtract 3-Digit Numbers	Round Whole Numbers to the Nearest Tens or Hundreds	Use Properties of Operations to Perform Multi-Digit Arithmetic
	Compare 2-Digit Numbers	Model Addition and Subtraction of 2-Digit Numbers	Compare 3-Digit Numbers	Model Addition and Subtraction of 3-Digit Numbers	Multiply 1-Digit Numbers By 2-Digit Multiples of 10	Mentally Add and Subtract 10 or 100 to 3-Digit Numbers

NUMBER AND OPERATIONS IN BASE TEN (28%)

STANDARD	STANDARD DESCRIPTION	AE-CCR LEVEL	TABE 11/12 EMPHASIS LEVEL
2.NBT.1	Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: (2.NBT.1.a, 2.NBT.1.b)	B	Low
3.NBT.1	Use place value understanding to round whole numbers to the nearest 10 or 100.	B	Medium
2.NBT.2	Count within 1000; skip-count by 5s, 10s, and 100s.	B	Medium
3.NBT.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	B	Low
2.NBT.3	Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	B	Low
3.NBT.3	Multiply one-digit whole numbers by multiples of 10 in the range 10 - 90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations.	B	Medium
2.NBT.4	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.	B	Medium
2.NBT.6	Add up to four two-digit numbers using strategies based on place value and properties of operations.	B	Medium
2.NBT.7	Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.	B	Medium

Examining both the Mathematics TABE Level E Blueprint and the curriculum matrix shows strong alignment. The wording and separations of each standard may be slightly different between the two but they cover the same content. The matrix content cells highlighted in lighter orange represents standards with low emphasis level on the TABE test while the ones in orange are the ones with medium emphasis level. The next few slides will compare the rest of the domains between the Mathematics TABE Level E Blueprint and the ABE Mathematics Curriculum Matrix.

2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20	The Equal Sign	Solve Addition and Subtraction Problems within 100	Solve Multiplication and Division Problems within 100	Multiplication Facts within 100	Solve 2-Step Problems or Equations
	Commutative and Associative Property of Addition	Solving Addition and Subtraction Equations	Commutative and Associative Property of Multiplication	Solve Multiplication and Division Equations	Distributive Property of Multiplication	Model Multiplication and Division within 100

	STANDARD	STANDARD DESCRIPTION	AE-CCR LEVEL	TABE 11/12 EMPHASIS LEVEL
OPERATIONS AND ALGEBRAIC THINKING (22%)	2.OA.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	B	Medium
	3.OA.1	Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 x 7.	B	Medium
	3.OA.2	Interpret whole-number quotients of whole numbers, e.g., interpret 56/8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56/8.	B	Low
	3.OA.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	B	Low
	3.OA.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = [box]/3, 6 x 6 = ?.	B	Low
	3.OA.5	Apply properties of operations as strategies to multiply and divide. Examples: If 6 x 4 = 24 is known, then 4 x 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) + (8 x 2) = 40 + 16 = 56. (Distributive property.)	B	Low
	3.OA.6	Understand division as an unknown-factor problem. For example, find 32/8 by finding the number that makes 32 when multiplied by 8.	B	Medium
	3.OA.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one knows 40/ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	B	Low
	3.OA.8	Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	B	Medium
	3.OA.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.	B	Low

The matrix content cells highlighted in lighter yellow represents standards with low emphasis level on the TABE test while the ones in yellow are the ones with medium emphasis level. The cell that is not highlighted in the shade of yellow, “Distributive Property of Multiplication,” means that it is not included in the TABE Level E Blueprint but does not mean it is not important to teach. This may also mean that this content may be assessed at the higher levels of the TABE Test (Level M). This could also mean that the cell is not directly assessed at this level test but is a necessary foundational skill to arrive at the correct answer.

3. Measurement and Data	Organize, Represent, and Interpret 3 Categories of Data	Indirectly Measure Lengths through Iteration	Analyze and Generate Picture Graphs and Bar Graphs	Analyze and Generate Line Plots	Measure and Estimate Lengths in Standard Units	Solve Problems Involving Time, Volume and Mass
			Represent Whole Number Lengths on a Number Line	Measuring and Estimating Areas of Plane Figures	Solve Problems Involving Perimeter of Polygons	Use Areas to Model Addition and Multiplication

MEASUREMENT AND DATA (28%)

STANDARD	STANDARD DESCRIPTION	AE-CCR LEVEL	TABE 11/12 EMPHASIS LEVEL
3.MD.1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	B	Medium
2.MD.2	Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.	B	Low
3.MD.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.	B	Medium
2.MD.3	Estimate lengths using units of inches, feet, centimeters, and meters.	B	Low
3.MD.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step how many more and how many less problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.	B	Low
2.MD.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	B	Low
3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units - whole numbers, halves, or quarters.	B	Low
3.MD.5	Recognize area as an attribute of plane figures and understand concepts of area measurement. (3.MD.5.b)	B	Low
2.MD.6	Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.	B	Low
3.MD.7	Relate area to the operations of multiplication and addition. (3.MD.7.a, 3.MD.7.b, 3.MD.7.c, 3.MD.7.d)	B	High
3.MD.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.	B	Medium
2.MD.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in a bar graph.	B	Low

The matrix content cells highlighted in lighter blue represents standards with low emphasis level on the TABE test, the ones in blue are the ones with medium emphasis level and the ones in darker blue are the ones with high emphasis level.

4. Geometry	Analyze, Compare, and Compose 3-Dimensional Shapes	2- and 3-Dimensional Composite Shapes	Analyze, Draw and Compare Shapes Having Specified Attributes	Identify Common Polygons and 3-Dimensional Figures	Categorize Shapes with Common Attributes	Partition Shapes into Parts with Equal Areas

	STANDARD	STANDARD DESCRIPTION	AE-CCR LEVEL	TABE 11/12 EMPHASIS LEVEL
GEOMETRY (10%)	2.G.1	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.	B	Medium
	3.G.1	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	B	Medium
	3.G.2	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.	B	Low
	2.G.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.	B	Low

The matrix content cells highlighted in lighter navy blue represents standards with low emphasis level on the TABE test while the ones in navy blue are the ones with medium emphasis level.

5. Number and Operations: Fractions		Represent Fractions with Denominators 2, 3, 4, 6, or 8 on a Number Line	Recognize Equivalent Fractions on a Number Line	Use Visual Models to Represent Equivalent Fractions	Compare Fractions with the Same Numerator or Denominator

NUMBER AND OPERATIONS—FRACTIONS (12%)	STANDARD	STANDARD DESCRIPTION	AE-CCR LEVEL	TABE 11/12 EMPHASIS LEVEL
	3.NF.1	Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.	B	Medium
	3.NF.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram. (3.NF.2.a, 3.NF.2.b)	B	Medium
	3.NF.3	Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. (3.NF.3.a, 3.NF.3.b, 3.NF.3.c, 3.NF.3.d)	B	High

The matrix content cells highlighted in gray represents standards with medium emphasis level on the TABE test, while the ones in darker gray are the ones with high emphasis level. The cell that is not highlighted, “Compare Fractions with the Same Numerator or Denominator,” means that it is not included in the TABE Level E Blueprint but does not mean it is not important to teach. This may also mean that this content may be assessed at the higher levels of the TABE Test (Level M). This could also mean that the cell is not directly assessed at this level test but is a necessary foundational skill to arrive at the correct answer.

Activity:

Examine the TABE 11 & 12 Assessment Blueprint for Level E together with your electronic copy of the ABE Mathematics Curriculum Matrix and answer the questions below.

What are the different domains tested at this level?

_____
_____
_____
_____
_____

How many standards are in each of the domains of the TABE 11 & 12 Blueprint Level E?

Are all the standards in each domain of the TABE 11 & 12 Assessment Blueprint for Level E covered by the cells in each domain of the ABE Mathematics Curriculum Matrix? Use your knowledge on how the matrix was developed to explain why or why not.

Reflection:

How would you use the TABE 11 & 12 Assessment Blueprints and the ABE Mathematics Curriculum Matrix in developing your lessons in the future?

Various Matrix Overlays

Learning Trajectory Overlays

Domain	NRS Level 1		NRS Level 2				NRS Level 3			
1. Number and Operations: Base Ten	Place Value of 2-Digit Numbers	Add and Subtract 2-Digit Numbers	Place Value of 3-Digit Numbers	Add and Subtract 3-Digit Numbers	Round Whole Numbers to the Nearest Tens or Hundreds	Use Properties of Operations to Perform Multi-Digit Arithmetic	Generalize Understanding of Place Value	Read and Write Multi-Digit Numbers in Names and Expanded Form	Multiply 4-Digit Numbers by 1- to 2-Digit Numbers	Use Place Value to Understand Decimals
	Compare 2-Digit Numbers	Model Addition and Subtraction of 2-Digit Numbers	Compare 3-Digit Numbers	Model Addition and Subtraction of 3-Digit Numbers	Multiply 1-Digit Numbers By 2-Digit Multiples of 10	Mentally Add and Subtract 10 or 100 to 3-Digit Numbers	Compare Any Multi-Digit Number	Round Multi-Digit Numbers to Any Place Value	Divide 4-Digit Numbers by 1-Digit Numbers	Read, Write, and Compare Decimals to Thousandths
							Basic Operations with Multi-Digit Numbers in Standard Algorithm	Perform Basic Operations on Decimal Numbers Using Multiple Strategies	Round Decimals to Any Place	Divide 4-Digit Numbers by 2-Digit Numbers Using Multiple Strategies
2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20	The Equal Sign	Solve Addition and Subtraction Problems within 100	Solve Multiplication and Division Problems within 100	Multiplication Facts within 100	Solve 2-Step Problems or Equations	Solve Multi-Step Problems Using Basic Operations	Interpret Multiplication as Comparison Statements	Interpret the Remainder in Problems	Multiples of 1-Digit Numbers Up to 100
	Commutative and Associative Property of Addition	Solving Addition and Subtraction Equations	Commutative and Associative Property of Multiplication	Solve Multiplication and Division Equations	Distributive Property of Multiplication	Model Multiplication and Division within 100	Check Answers Using Mental Computation and Estimation	Solve Problems Involving Multiplicative Comparisons	Find All Factor Pairs of Any 2-Digit Whole Number	Prime and Composite Numbers within 100
							Write and Interpret Numerical Expressions	Interpret Expressions without Evaluating Them	Generate and Analyze Numeric and Geometric Patterns	Identify Inexplicit Features of a Pattern from a Rule
3. Measurement and Data	Organize, Represent, and Interpret 3 Categories of Data	Indirectly Measure Lengths through Iteration	Analyze and Generate Picture Graphs and Bar Graphs	Analyze and Generate Line Plots	Measure and Estimate Lengths in Standard Units	Solve Problems Involving Time, Volume and Mass	Solve Problems in Length, Time, Volume, Mass and Money Including Fractions	Solve Problems in Length, Time, Volume, Mass and Money Including Decimals	Solve Problems Involving Information Presented in Line Plots	Recognize Angles
			Represent Whole Number Lengths on a Number Line	Measuring and Estimating Areas of Plane Figures	Solve Problems Involving Perimeter of Polygons	Use Areas to Model Addition and Multiplication	Apply Area and Perimeter Formulas for Rectangles	Convert Measurements within a System	Organize Unit Fraction Data (1/2, 1/4, 1/8) in a Line Plot	Understand Concepts of Angle Measurement
							Measure and Sketch Angles in Whole-Number Degrees	Solve Addition and Subtraction Problems for Unknown Angles		
4. Geometry	Analyze, Compare, and Compose 3-Dimensional Shapes	2- and 3-Dimensional Composite Shapes	Analyze, Draw and Compare Shapes Having Specified Attributes	Identify Common Polygons and 3-Dimensional Figures	Categorize Shapes with Common Attributes	Partition Shapes into Parts with Equal Areas	Draw and Identify Points, Lines, Line segments, and Rays	Solve Problems by Graphing Points on the Coordinate Plane	Solve Problems Involving Area, Surface Area, and Volume	Draw Polygons in a Coordinate Plane
							Draw and Identify Angles, Perpendicular and Parallel Lines	Classify 2-Dimensional Figures into Categories Based on Properties	Find Areas of Polygons by Composing or Decomposing	Find the Length of a Side with the Same First or Second Coordinate
							Represent 3-Dimensional Figures Using Nets	Use Nets to Find the Surface Area of Figures		
5. Number and Operations: Fractions			Represent Fractions with Denominators 2, 3, 4, 6, or 8 on a Number Line	Recognize Equivalent Fractions on a Number Line	Use Visual Models to Represent Equivalent Fractions	Compare Fractions with the Same Numerator or Denominator	Generate Equivalent Fractions	Compare Fractions Using Common Numerators or Denominators	Decompose Fractions as Sum of Fractions with the same Denominator	Decompose Fractions as Multiples of Unit Fractions
							Use Models to Illustrate Equivalent Fractions	Compare Fractions Using Benchmark Fractions Such as 1/2	Add and Subtract Mixed Numbers Using Equivalent Fractions	Multiply Fractions by a Whole Number
							Multiply and Divide Fractions	Solve Problems Involving Multiplication and Division of Fractions	Convert Fractions with Denominators 10 or 100 to Decimals	Solve Problems Involving Addition and Subtraction of Fractions
6. Expressions and Equations							Write and Evaluate Algebraic Expressions with Exponents	Identify and Generate Equivalent Algebraic Expressions	Use Substitution to Determine If an Equation or Inequality is True	Express One Quantity as the Dependent Variable of the Another Quantity
							Perform the Order of Operations on Algebraic Expressions	Reason and Solve One-Variable Equations and Inequalities	Use Variables to Represent Two Related Quantities in a Problem	Use Graphs, Tables and Equations to Show Variable Relationships
7. The Number System							Fluently Divide Multi-Digit Numbers	Fluently Add, Subtract, Multiply and Divide Multi-Digit Decimals	Find the Greatest Common Factor of Two Numbers ≤ 100	Apply Distributive Property to Generate Equivalent Expressions
							Find the Least Common Multiple of Two Numbers ≤ 12	Use Models to Illustrate, Interpret and Compute Quotients of Fractions	Solve Problems Involving Division of Fractions by Fractions	

Thematic and Career Cluster Overlays

ADULT BASIC EDUCATION MATHEMATIC DOMAINS					
Domain Number	Overarching Theme: Geometry (Domain 6)				
	Domain Name	Starting with a Point	Lines	Planes	Space
1	Number and Operations: Base Ten	Whole Number Operations			
2	Operations and Algebraic Thinking			Properties of Addition and Multiplication (Area Method of Addition and Multiplication)	Relating Volumes to Multiplication and Addition to Solve Real-World Problems
3	Measurement and Data		Representing and Analyzing Data (Line Plots)	Areas, Circle Graphs and Bar Graphs	Volumes and Surface Areas
5	Number and Operations: Fractions			Parts of a Whole and Unit Fractions	
6	Expressions and Equations	Evaluating Expressions and Solutions to Linear Equations	Linear Equations and Equivalent Expressions	Squares, Square Roots and Simultaneous Linear Equations	Cubes and Cube Roots
7	The Number System		The Number Line and Number Operations		
8	Ratios and Proportional Relationships		Double Number Line Diagrams and Graphs of Proportional Relationship	Tape Diagrams	
9	Statistics and Probability		Box Plots and Measures of Central Tendency	Dot Plots (Scatter Plots) and Histograms	
10	Functions		Linear Functions		
		Business, Management and Administration	Communications and Information Systems	Engineering, Manufacturing and Technology	Food and Health Sciences
		Career Cluster			

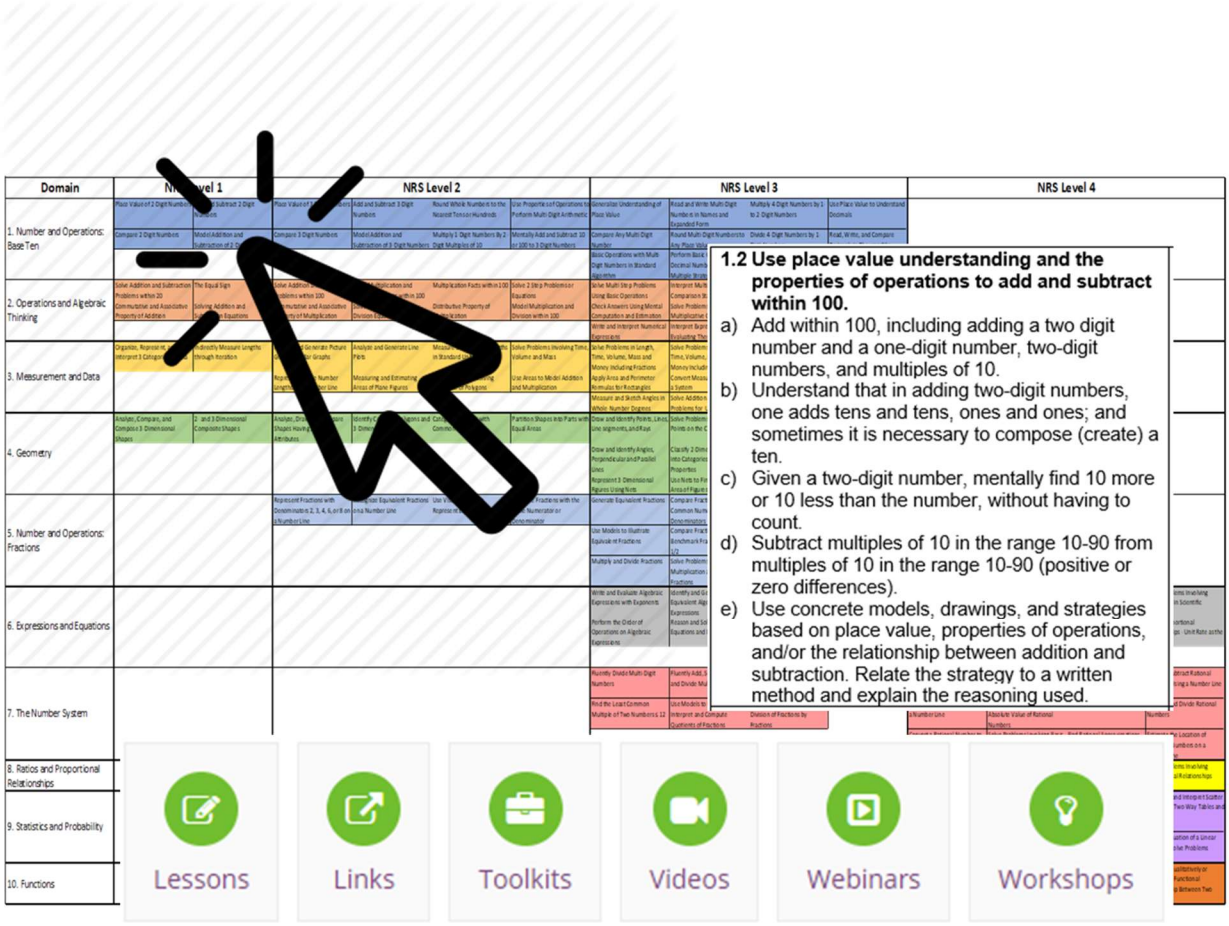
GED High Impact Indicator and Performance Level Descriptors Overlays

Domain	NRS Level 1		NRS Level 2				NRS Level 3			
1. Number and Operations: Base Ten	Place Value of 2-Digit Numbers	Add and Subtract 2-Digit Numbers	Place Value of 3-Digit Numbers	Add and Subtract 3-Digit Numbers	Round Whole Numbers to the Nearest Tens or Hundreds	Use Properties of Operations to Perform Multi-Digit Arithmetic	Generalize Understanding of Place Value	Read and Write Multi-Digit Numbers in Names and Expanded Form	Multiply 4-Digit Numbers by 1- to 2-Digit Numbers	Use Place Value to Understand Decimals
	Compare 2-Digit Numbers	Model Addition and Subtraction of 2-Digit Numbers	Compare 3-Digit Numbers	Model Addition and Subtraction of 3-Digit Numbers	Multiply 1-Digit Numbers By 2-Digit Multiples of 10	Mentally Add and Subtract 10 or 100 to 3-Digit Numbers	Compare Any Multi-Digit Number	Round Multi-Digit Numbers to Any Place Value	Divide 4-Digit Numbers by 1-Digit Numbers	Read, Write, and Compare Decimals to Thousandths
							Basic Operations with Multi-Digit Numbers in Standard Algorithm	Perform Basic Operations on Decimal Numbers Using Multiple Strategies	Round Decimals to Any Place	Divide 4-Digit Numbers by 2-Digit Numbers Using Multiple Strategies
2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20	The Equal Sign	Solve Addition and Subtraction Problems within 100	Solve Multiplication and Division Problems within 100	Multiplication Facts within 100	Solve 2-Step Problems or Equations	Solve Multi-Step Problems Using Basic Operations	Interpret Multiplication as Comparison Statements	Interpret the Remainder in Problems	Multiples of 1-Digit Numbers Up to 100
	Commutative and Associative Property of Addition	Solving Addition and Subtraction Equations	Commutative and Associative Property of Multiplication	Solve Multiplication and Division Equations	Distributive Property of Multiplication	Model Multiplication and Division within 100	Check Answers Using Mental computation and Estimation	Solve Problems Involving Multiplicative Comparisons	Find All Factor Pairs of Any 2-Digit Whole Number	Prime and Composite Numbers within 100
							Write and Interpret Numerical Expressions	Interpret Expressions without Evaluating Them	Generate and Analyze Numeric and Geometric Patterns	Identify Inexplicit Features of a Pattern from a Rule
3. Measurement and Data	Organize, Represent, and Interpret 3 Categories of Data	Indirectly Measure Lengths through Iteration	Analyze and Generate Picture Graphs and Bar Graphs	Analyze and Generate Line Plots	Measure and Estimate Lengths in Standard Units	Solve Problems Involving Time, Volume and Mass	Solve Problems in Length, Time, Volume, Mass and Money including Fractions	Solve Problems in Length, Time, Volume, Mass and Money including Decimals	Solve Problems Involving Information Presented in Line Plots	Recognize Angles
			Represent Whole Number Lengths on a Number Line	Measuring and Estimating Areas of Plane Figures	Solve Problems Involving Perimeter of Polygons	Use Areas to Model Addition and Multiplication	Apply Area and Perimeter Formulas for Rectangles	Convert Measurements within a System	Organize Unit Fraction Data (1/2, 1/4, 1/8) in a Line Plot	Understand Concepts of Angle Measurement
							Measure and Sketch Angles in Whole-Number Degrees	Solve Addition and Subtraction Problems for Unknown Angles		
4. Geometry	Analyze, Compare, and Compose 3-Dimensional Shapes	2- and 3-Dimensional Composite Shapes	Analyze, Draw and Compare Shapes Having Specified Attributes	Identify Common Polygons and 3-Dimensional Figures	Categorize Shapes with Common Attributes	Partition Shapes into Parts with Equal Areas	Draw and Identify Points, Lines, Line segments, and Rays	Solve Problems by Graphing Points on the Coordinate Plane	Solve Problems Involving Area, Surface Area, and Volume	Draw Polygons in a Coordinate Plane
							Draw and Identify Angles, Perpendicular and Parallel Lines	Classify 2-Dimensional Figures into Categories Based on Properties	Find Areas of Polygons by Composing or Decomposing	Find the Length of a Side with the Same First or Second Coordinate
							Represent 3-Dimensional Figures Using Nets	Use Nets to Find the Surface Area of Figures		

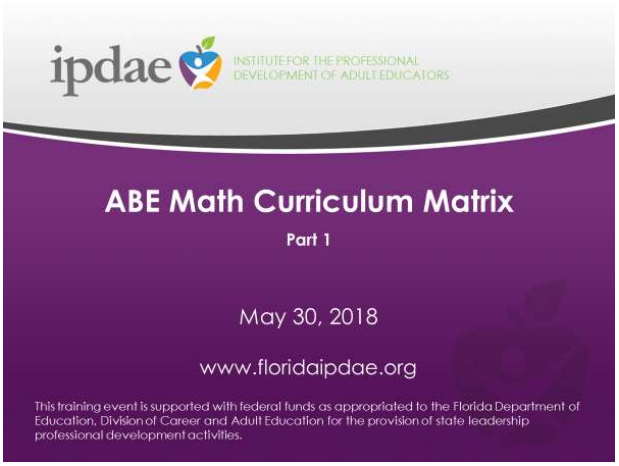
TABE 11 & 12 Mathematics Blueprint Overlays

Domain	NRS Level 1		NRS Level 2			
1. Number and Operations: Base Ten	Place Value of 2-Digit Numbers	Add and Subtract 2-Digit Numbers	Place Value of 3-Digit Numbers	Add and Subtract 3-Digit Numbers	Round Whole Numbers to the Nearest Tens or Hundreds	Use Properties of Operations to Perform Multi-Digit Arithmetic
	Compare 2-Digit Numbers	Model Addition and Subtraction of 2-Digit Numbers	Compare 3-Digit Numbers	Model Addition and Subtraction of 3-Digit Numbers	Multiply 1-Digit Numbers By 2-Digit Multiples of 10	Mentally Add and Subtract 10 or 100 to 3-Digit Numbers
2. Operations and Algebraic Thinking	Solve Addition and Subtraction Problems within 20	The Equal Sign	Solve Addition and Subtraction Problems within 100	Solve Multiplication and Division Problems within 100	Multiplication Facts within 100	Solve 2-Step Problems or Equations
	Commutative and Associative Property of Addition	Solving Addition and Subtraction Equations	Commutative and Associative Property of Multiplication	Solve Multiplication and Division Equations	Distributive Property of Multiplication	Model Multiplication and Division within 100
3. Measurement and Data	Organize, Represent, and Interpret 3 Categories of Data	Indirectly Measure Lengths through Iteration	Analyze and Generate Picture Graphs and Bar Graphs	Analyze and Generate Line Plots	Measure and Estimate Lengths in Standard Units	Solve Problems Involving Time, Volume and Mass
			Represent Whole Number Lengths on a Number Line	Measuring and Estimating Areas of Plane Figures	Solve Problems Involving Perimeter of Polygons	Use Areas to Model Addition and Multiplication
4. Geometry	Analyze, Compare, and Compose 3-Dimensional Shapes	2- and 3-Dimensional Composite Shapes	Analyze, Draw and Compare Shapes Having Specified Attributes	Identify Common Polygons and 3-Dimensional Figures	Categorize Shapes with Common Attributes	Partition Shapes into Parts with Equal Areas

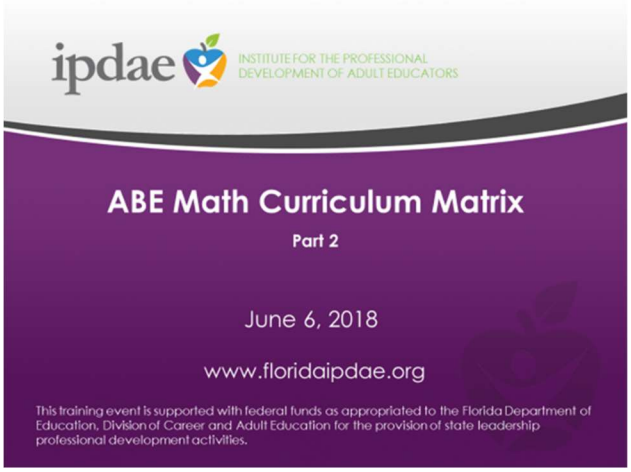
The Interactive Online Curriculum Matrix



Additional Curriculum Matrix Resources



https://www.youtube.com/watch?v=hKs-obd0ufI



https://www.youtube.com/watch?v=gZ1MEKVppZY

Webinar Documents

Additional handouts and activity books relating to the matrix can be downloaded from the Presentation Documents Section of each ABE Mathematics Curriculum Matrix Webinars.