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INSTITUTE FOR THE PROFESSIONAL
DEVELOPMENT OF ADULT EDUCATORS

ABE Math Curriculum Matrix

Part 1

May 30, 2018

www.floridaipdae.org

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Your Facilitator

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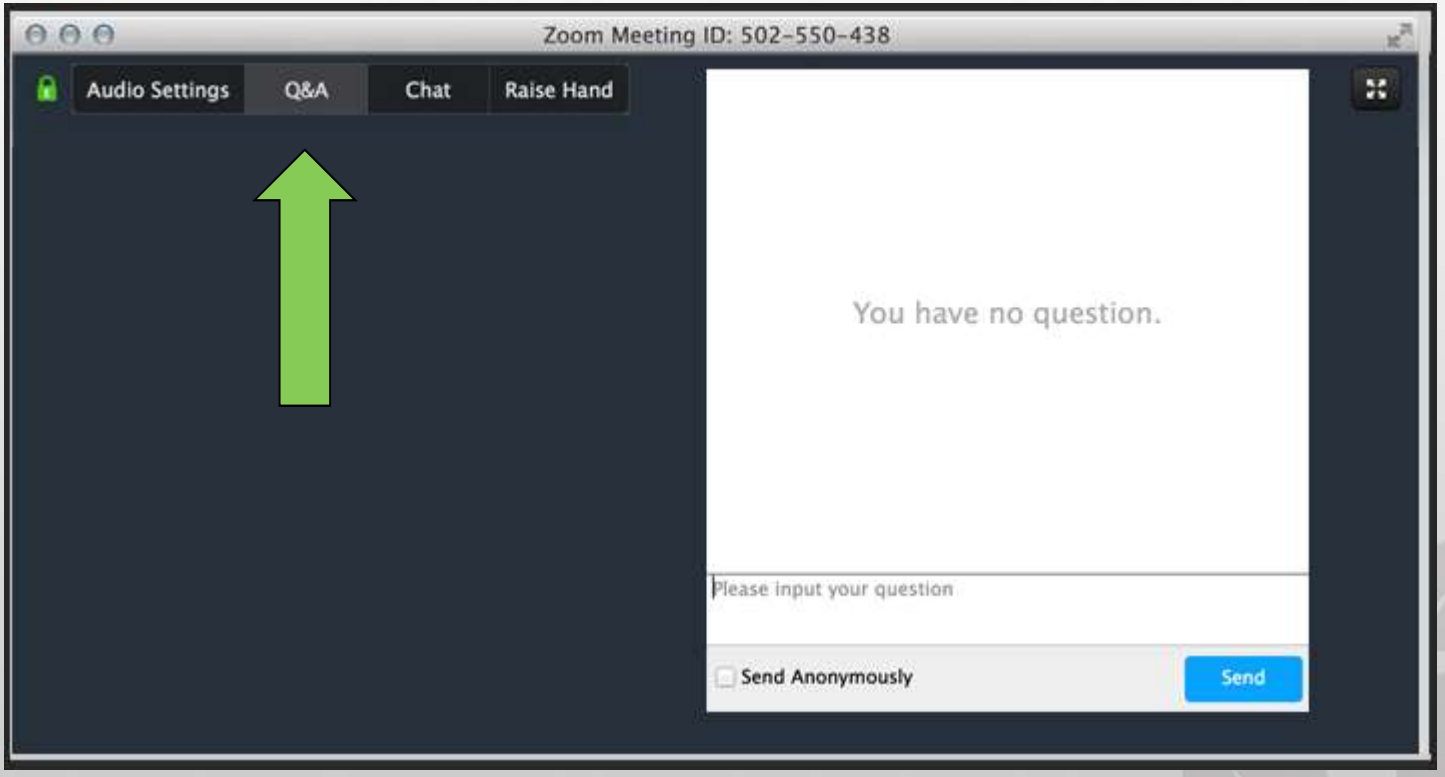
Webinar Things to Remember

- If you have a question, please type it into the **Q&A** option.



- Attendee microphones will be muted. You will be in **listen only** mode.
- Today's presentation is being **recorded**. It will be archived and available on the IPDAE website within 48 hours.

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Agenda

I. Data Behind the Development of the Matrix
II. The ABE Mathematics Curriculum Frameworks
III. The ABE Mathematics Curriculum Matrix
IV. Benefits to the Teacher/Student
V. Characteristics of the Matrix
VI. Applications of the Matrix
VII. Various Matrix Overlays
VIII. Q&A
IX. Evaluation

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Survey Data

FOR EDUCATORS, BY EDUCATORS

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Survey Data

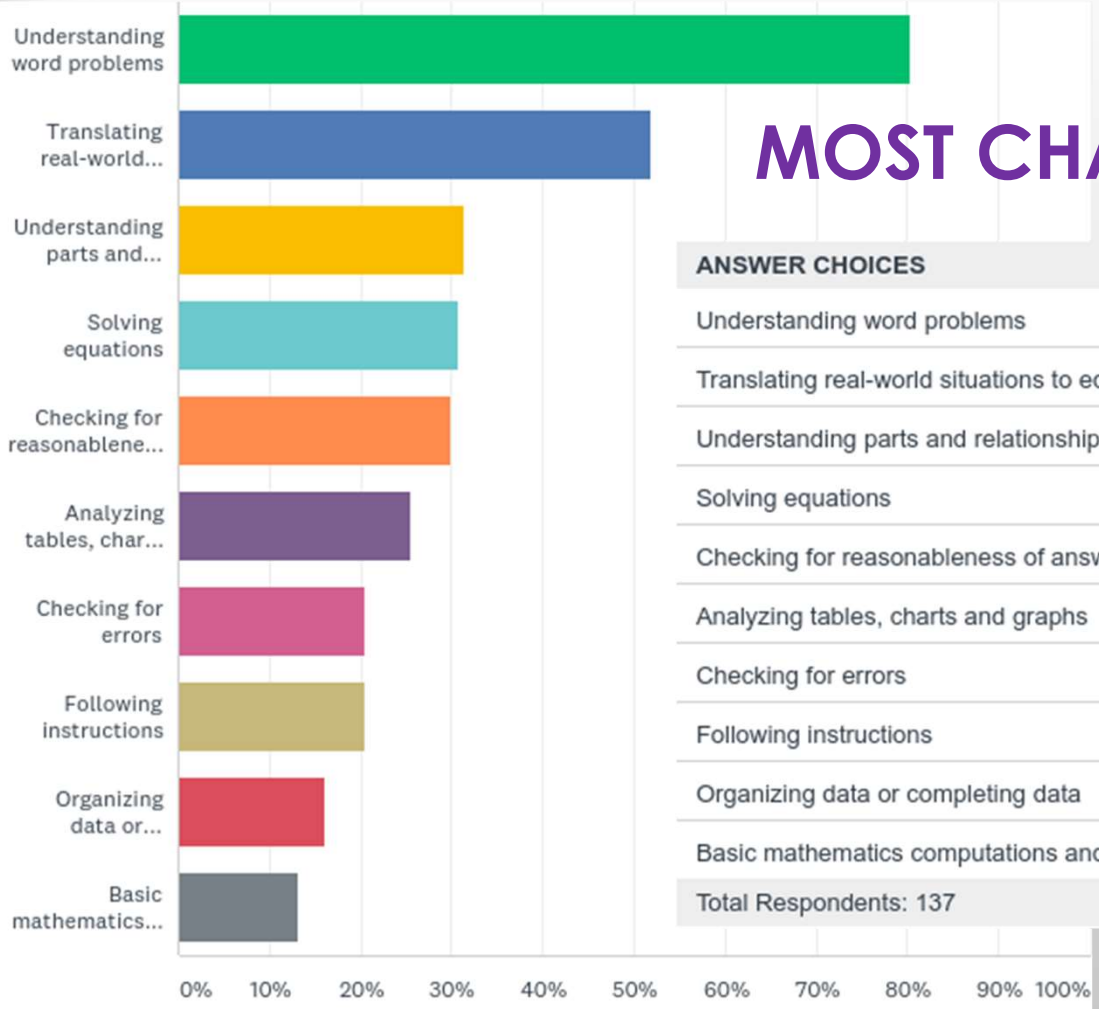
Workbook p. 1

LOWEST PERFORMING SKILLS

ANSWER CHOICES	RESPONSES	
Mathematics Computation – Fractions	70.07%	96
Problem Solving & Reasoning	55.47%	76
Mathematics Computation – Algebraic Operations	54.01%	74
Mathematics Computation – Decimals and Percents	51.82%	71
Statistics & Probability	49.64%	68
Patterns, Functions, Algebra	44.53%	61
Mathematics Computation – Integers	39.42%	54
Geometry & Spatial Sense	35.77%	49
Computation in Context	31.39%	43
Measurement	27.74%	38
Applied Mathematics in Number & Number Operations	21.90%	30
Data Analysis	18.98%	26
Estimation	13.87%	19
Mathematics Computation – Whole Numbers	2.19%	3
Total Respondents: 137		

Survey Data

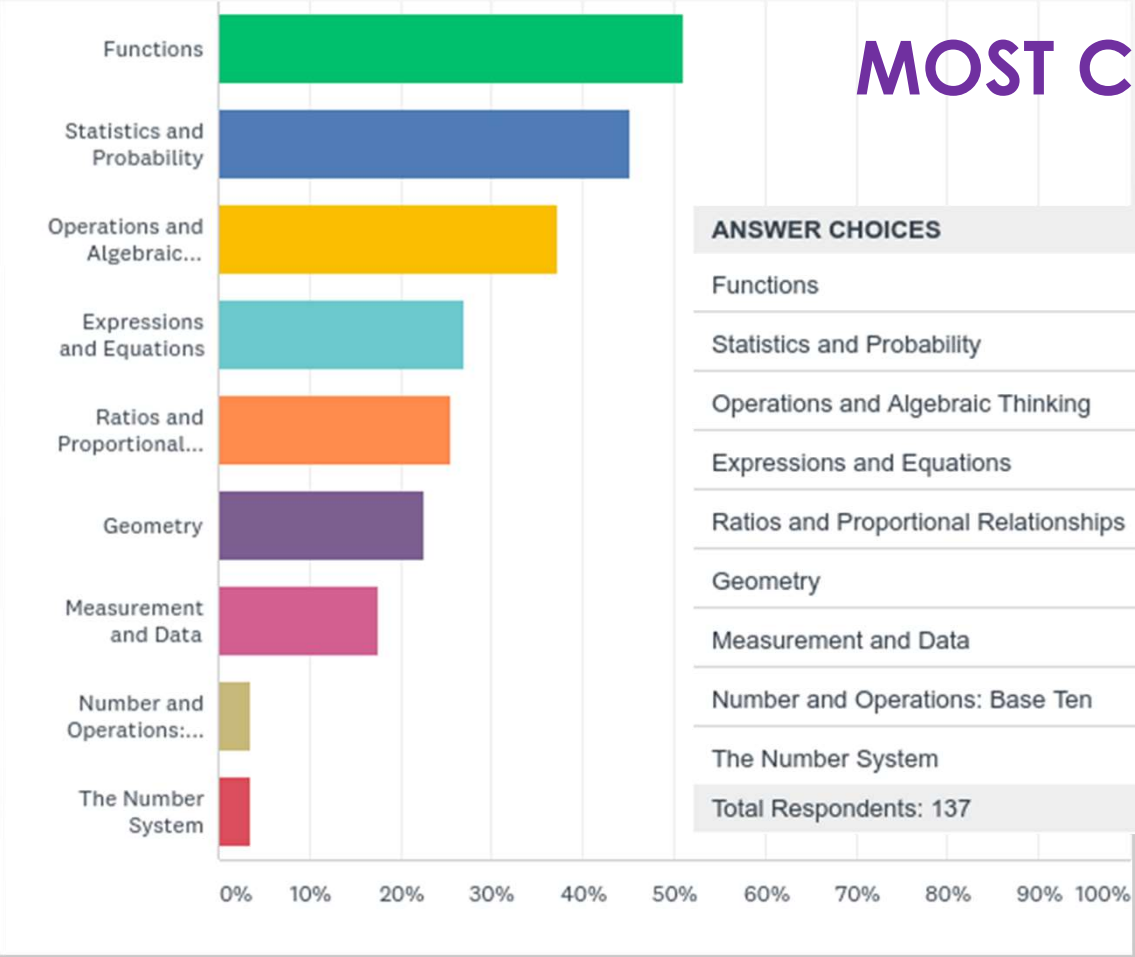
Workbook p. 2



MOST CHALLENGING SKILLS

ANSWER CHOICES	RESPONSES	
Understanding word problems	80.29%	110
Translating real-world situations to equations	51.82%	71
Understanding parts and relationships between geometric figures	31.39%	43
Solving equations	30.66%	42
Checking for reasonableness of answers	29.93%	41
Analyzing tables, charts and graphs	25.55%	35
Checking for errors	20.44%	28
Following instructions	20.44%	28
Organizing data or completing data	16.06%	22
Basic mathematics computations and number sense	13.14%	18
Total Respondents: 137		

Special Mention: basic multiplication, slope of a line and math vocabulary.

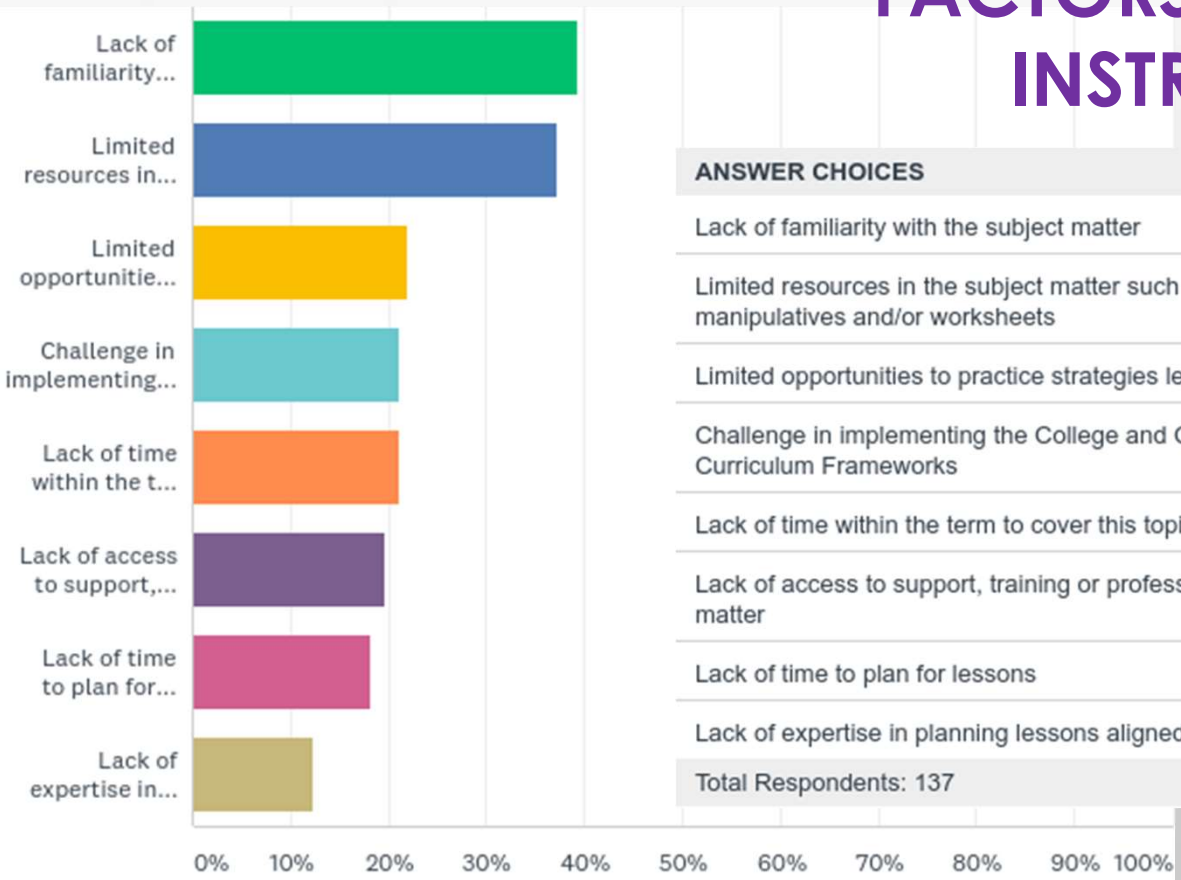


MOST CHALLENGING TO TEACH

ANSWER CHOICES	RESPONSES	
Functions	51.09%	70
Statistics and Probability	45.26%	62
Operations and Algebraic Thinking	37.23%	51
Expressions and Equations	27.01%	37
Ratios and Proportional Relationships	25.55%	35
Geometry	22.63%	31
Measurement and Data	17.52%	24
Number and Operations: Base Ten	3.65%	5
The Number System	3.65%	5
Total Respondents: 137		

Workbook p. 4

FACTORS AFFECTING INSTRUCTION



ANSWER CHOICES	RESPONSES	
Lack of familiarity with the subject matter	39.42%	54
Limited resources in the subject matter such as books, technology, lesson plans, manipulatives and/or worksheets	37.23%	51
Limited opportunities to practice strategies learned from professional development	21.90%	30
Challenge in implementing the College and Career Readiness Standards and the Curriculum Frameworks	21.17%	29
Lack of time within the term to cover this topic	21.17%	29
Lack of access to support, training or professional development in the subject matter	19.71%	27
Lack of time to plan for lessons	18.25%	25
Lack of expertise in planning lessons aligned to the standards	12.41%	17
Total Respondents: 137		

Special Mention: differentiating instruction for stacked levels, lack of motivation, weak foundations, difficulty in explanation, limited practical application, teaching online, lack of retention, poor attendance, and anxiety

EFFECTIVE SUPPORTS FOR INSTRUCTION

ANSWER CHOICES	RESPONSES	
Face-to-Face Workshops	57.66%	79
Print Materials (lesson plans, handouts, slides, worksheets and study guides)	54.74%	75
Short Webinars	42.34%	58
Hands-On Workshop Activities	41.61%	57
Suggested Websites	35.04%	48
Online Training Modules	32.85%	45
Short Videos	27.74%	38
Collaboration with Other Professionals	25.55%	35
Technology Tools	25.55%	35
Guides for Using the CCRS or Curriculum Frameworks	16.79%	23
Webcasts or Podcasts	13.87%	19
Observing Other Teachers	13.14%	18
On-Site Support Personnel (Curriculum Specialists or Resource Teachers)	12.41%	17
On-Site Mentorship Programs	9.49%	13
Total Respondents: 137		

Special Mention: Quick and easy to implement strategies, guest experts, classroom demonstrations, blended approach, strategy sharing, videos that model multiple skills and paid planning

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The Starting Point of the ABE Math Curriculum Matrix

THE CURRICULUM FRAMEWORKS

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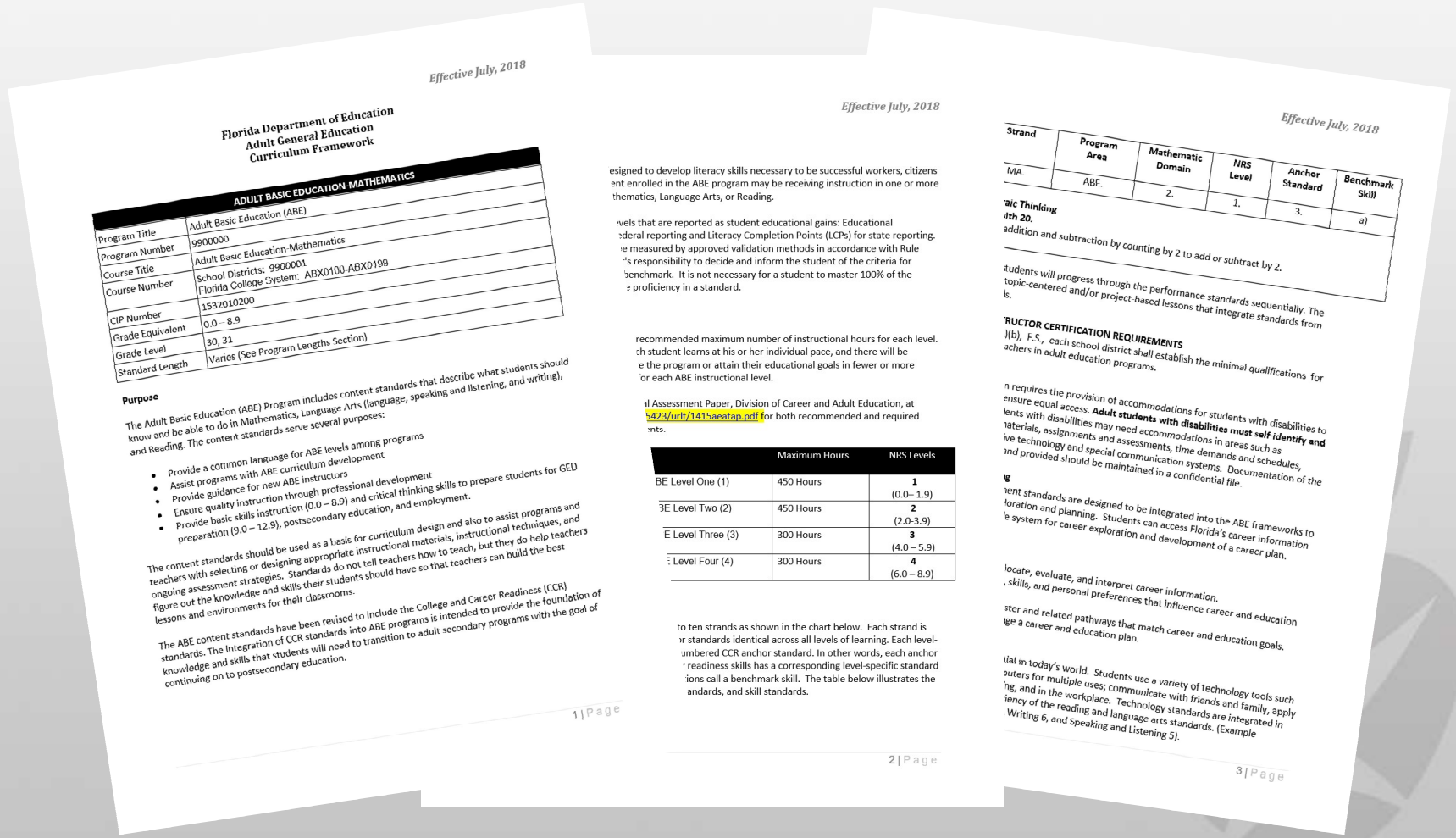
Curriculum Frameworks

The ABE Mathematics Curriculum Frameworks



Effective July, 2018

Florida Department of Education
Adult General Education
Curriculum Framework

ADULT BASIC EDUCATION-MATHEMATICS	
Program Title	Adult Basic Education (ABE)
Program Number	9900000
Course Title	Adult Basic Education-Mathematics
Course Number	School Districts: 9900001 Florida College System: ABX0100-ABX0199
CIP Number	1532010200
Grade Equivalent	0.0 – 8.9
Grade Level	30, 31
Standard Length	Varies (See Program Lengths Section)

Purpose

The Adult Basic Education (ABE) Program includes content standards that describe what students should know and be able to do in Mathematics, Language Arts (language, speaking and listening, and writing), and Reading. 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.

The ABE content standards have been revised to include the College and Career Readiness (CCR) standards. The integration of CCR standards into ABE programs is intended to provide the foundation of knowledge and skills that students will need to transition to adult secondary programs with the goal of continuing on to postsecondary education.

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Effective July, 2018

esigned to develop literacy skills necessary to be successful workers, citizens ent enrolled in the ABE program may be receiving instruction in one or more thematics, Language Arts, or Reading.

vels that are reported as student educational gains: Educational ederal reporting and Literacy Completion Points (LCPs) for state reporting. e measured by approved validation methods in accordance with Rule 's responsibility to decide and inform the student of the criteria for benchmark. It is not necessary for a student to master 100% of the proficiency in a standard.

recommended maximum number of instructional hours for each level. ch student learns at his or her individual pace, and there will be e the program or attain their educational goals in fewer or more or each ABE instructional level.

l Assessment Paper, Division of Career and Adult Education, at 5423/urlt/1415aeatap.pdf for both recommended and required nts.

	Maximum Hours	NRS Levels
BE Level One (1)	450 Hours	**1** (0.0– 1.9)
BE Level Two (2)	450 Hours	**2** (2.0-3.9)
E Level Three (3)	300 Hours	**3** (4.0 – 5.9)
Level Four (4)	300 Hours	**4** (6.0 – 8.9)

to ten strands as shown in the chart below. Each strand is r standards identical across all levels of learning. Each level- umbered CCR anchor standard. In other words, each anchor readiness skills has a corresponding level-specific standard ions call a benchmark skill. The table below illustrates the andards, and skill standards.

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Effective July, 2018

Strand	Program Area	Mathematic Domain	NRS Level	Anchor Standard	Benchmark Skill
MA.	ABE.	2.	1.	3.	a)

aic Thinking
ith 20.
addition and subtraction by counting by 2 to add or subtract by 2.

tudents will progress through the performance standards sequentially. The topic-centered and/or project-based lessons that integrate standards from ls.

RUCTOR CERTIFICATION REQUIREMENTS
)(b), F.S., each school district shall establish the minimal qualifications for achers in adult education programs.

n requires the provision of accommodations for students with disabilities to ensure equal access. **Adult students with disabilities must self-identify and** lents with disabilities may need accommodations in areas such as aterials, assignments and assessments, time demands and schedules, ive technology and special communication systems. Documentation of the nd provided should be maintained in a confidential file.

g
ent standards are designed to be integrated into the ABE frameworks to loration and planning. Students can access Florida's career information e system for career exploration and development of a career plan.

locate, evaluate, and interpret career information.
skills, and personal preferences that influence career and education

ster and related pathways that match career and education goals.
ge a career and education plan.

tial in today's world. Students use a variety of technology tools such uters for multiple uses; communicate with friends and family, apply ng, and in the workplace. Technology standards are integrated in iency of the reading and language arts standards. (Example Writing 6, and Speaking and Listening 5).

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The 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

The ABE Mathematics Standards

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

Benchmark Skills/ Related Standards

This formatting and arrangement of math standards and benchmark skills span **25 pages** of the ABE Mathematics Curriculum Frameworks.

THE ABE MATH CURRICULUM MATRIX

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Curriculum Matrix

The ABE 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	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 Commutative and Associative Property of Addition	The Equal Sign Solving Addition and Subtraction Equations	Solve Addition and Subtraction Problems within 100 Commutative and Associative Property of Multiplication	Solve Multiplication and Division Problems within 100 Solve Multiplication and Division Equations	Multiplication Facts within 100 Distributive Property of Multiplication	Solve 2 Step Problems or Equations Model Multiplication and Division within 100	Solve Multi Step Problems Using Basic Operations Check Answers Using Mental Computation and Estimation	Interpret Multiplication as Comparison Statements Solve Problems Involving Multiplicative Comparisons	Interpret the Remainder in Problems Find All Factor Pairs of Any 2 Digit Whole Number	Multiples of 1 Digit Numbers Up to 100 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 Represent Whole Number Lengths on a Number Line	Analyze and Generate Line Plots Measuring and Estimating Areas of Plane Figures	Measure and Estimate Lengths in Standard Units Solve Problems Involving Perimeter of Polygons	Solve Problems Involving Time, Volume and Mass Use Areas to Model Addition and Multiplication	Solve Problems in Length, Time, Volume, Mass and Money Including Fractions Apply Area and Perimeter Formulas for Rectangles	Solve Problems in Length, Time, Volume, Mass and Money Including Decimals Convert Measurements within a System	Solve Problems Involving Information Presented in Line Plots Organize Unit Fraction Data (1/2, 1/4, 1/8) in a Line Plot	Recognize Angles 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 Draw and Identify Angles, Perpendicular and Parallel Lines Represent 3 Dimensional Figures Using Nets	Solve Problems by Graphing Points on the Coordinate Plane Classify 2 Dimensional Figures into Categories Based on Properties Use Nets to Find the Surface Area of Figures	Solve Problems Involving Area, Surface Area, and Volume Find Areas of Polygons by Composing or Decomposing	Draw Polygons in a Coordinate Plane Find the Length of a Side with the Same First or Second Coordinate	Solve Problems Involving Scale Drawings of Geometric Figures Solve Problems Involving Angle Measure, Areas, SA and Volume	Produce Congruence and Similarity Using Models Recognize Congruence and Similarity from Transformations	Angle Sum and Exterior Angles of Triangles and Transversals 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 Perform the Order of Operations on Algebraic Expressions	Identify and Generate Equivalent Algebraic Expressions Reason and Solve One Variable Equations and Inequalities	Use Substitution to Determine if an Equation or Inequality is True Use Variables to Represent Two Related Quantities in a Problem	Express One Quantity as the Dependent Variable of the Another Quantity Use Graphs, Tables and Equations to Show Variable Relationships	Add, Subtract, Factor, and Expand Linear Expressions Rewrite Expressions to Show Relationships Between Quantities Solve Simultaneous Linear Equations in One Variable	Construct Equations and Inequalities to Solve Problems Solve Problems Using Algebraic Equations with Rational Coefficients	Apply the Properties of Exponents to Generate Equivalent Expressions Evaluate Square and Cube Roots of Perfect Squares and Cubes	Solve Problems Involving Quantities in Scientific Notation Graph Proportional Relationships - Unit Rate as the Slope
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	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
							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		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

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Curriculum Matrix

Open your electronic copy of the ABE Math 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 Measures, 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 Numerator 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 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

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Curriculum Matrix

How would you use this tool in your ABE/GED classroom?

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 Measures, 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 Numerator 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

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Benefits to the Teacher/Student

- To summarize the ABE math standards in a more visual representation
- To show an overall picture of the ABE math standards
- To show the logical grouping and possible sequencing of the standards
- To understand how each standards relate to one another
- To organize the standards in ABE levels across conceptual categories/domains
- To show how much content/objectives are covered at each ABE level or domain

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Characteristics

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

- Composed of 163 cells
- Divided according to ABE Levels
- Each domain is color coded
- Anchor standards are written as topics/concepts

Applications

- The matrix can be used in planning (daily, weekly, or by unit).

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

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Applications

- The matrix can be used to emphasize big ideas or **learning trajectories** in the standards.

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	

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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/

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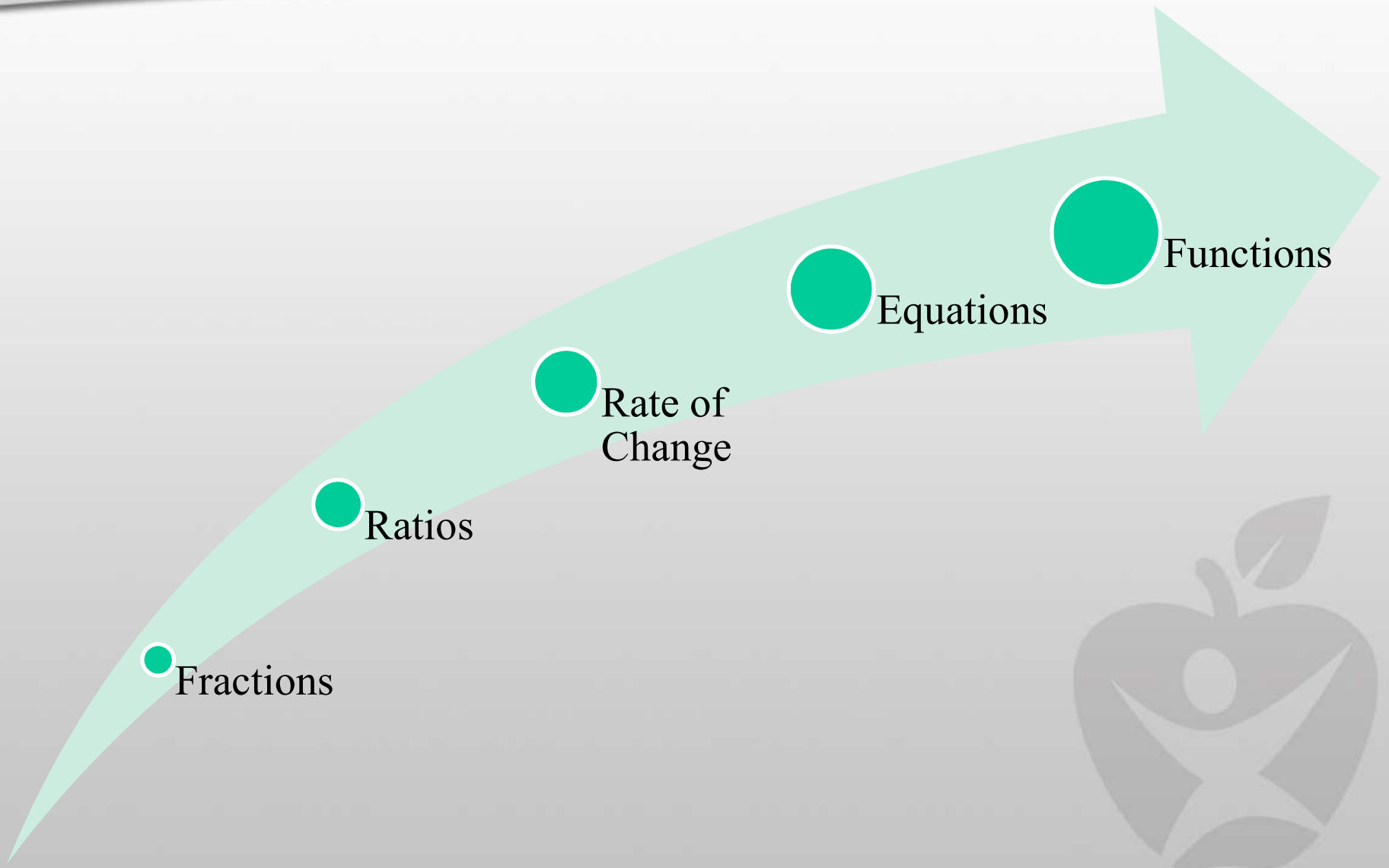
Example



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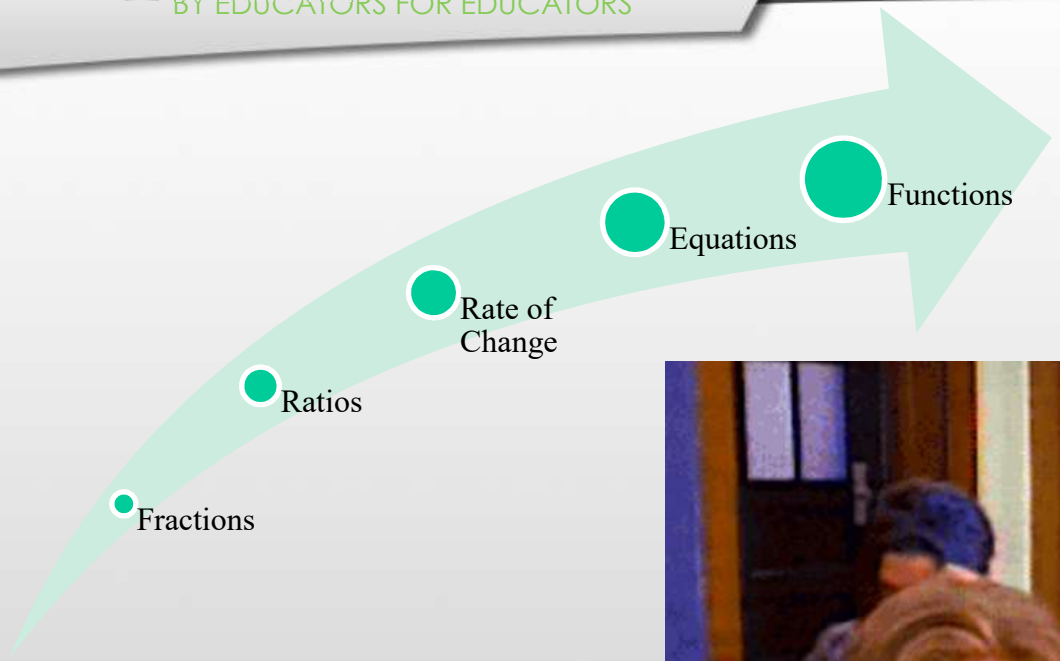
The Most Important Question



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Applications

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.

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Applications

- The matrix can be used to emphasize big ideas or learning trajectories towards GED **High Impact Indicators**.

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		

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

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

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Applications

- The matrix can be used to develop a thematic approach to teaching and/or **contextualize instruction**.

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			

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Applications

- 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.

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 Invariant 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	Rectangular Arrays
			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 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 Plotting Points on the Coordinate Plane	Solve Problems Involving Area, Surface Area, and Volume	Draw Polygons in the 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 Numerator or Denominators Compare Fractions Using Benchmark Fractions such as 1/2 Solve Problems Involving Multiplication and Division of Fractions	Decompose Fractions as a 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	Read Model, Represent and Multiply 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 Truth in Solution of Inequality or Pair	Express One Quantity as the Dependent Variable of the Other Given Equations
							Perform the Indicated Operations on Algebraic Expressions	Reason and Solve One Variable Equations and Inequalities	Use Variables to Represent Two Related Quantities in a Problem	Understand Tables and Equations to Show Verbal Relationships
7. The Number System							Fluently Divide Multi Digit Numbers Find the Least Common Multiple of Two Numbers to 12	Fluently Add, Subtract, Multiply and Divide Multi Digit Decimals Use Models to Illustrate Inverses and Compare Quantities of Fractions	Find the Greatest Common Factor of Two Numbers to 100 Solve Problems Involving Division of Fractions by Fractions	Apply Substitution Property to Write Equivalent Expressions

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Applications

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

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

These group or individual student profiles will greatly help teachers in **Differentiating Instruction and Scaffolding**.

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Applications

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 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
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							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

These group or individual student profiles also help in developing **formative assessments** to determine mastery of each standard.

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ABE Math Curriculum Matrix

Part 2

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Evaluation

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