CEI®
CREATIVE EDUCATION INSTITUTE®

Mathematical Learning Systems and Its Alignment to the
COMMON CORE STATE STANDARDS

Mathematical Learning Systems and Its Alignment to the COMMON CORE STATE STANDARDS

Mathematical Learning Systems (MLS) is a proven, scientifically research based, therapeutic approach to correct the core of learning problems — faulty sensory processing. A strong tool for educators needing to address Tier 2 and Tier 3 RTI students, MLS is designed for struggling learners and those identified with learning disabilities.

On page 4 of the introduction section of the Common Core State Standards, the authors include some important limitations to the CCSS. They note:

> *The Standards set grade-specific standards but do not define the intervention methods or materials necessary to support students who are well below or well above grade level expectations. It is also beyond the scope of the Standards to define the full range of supports appropriate for the English language learners and for students with special needs. At the same time, all students must have the opportunity to learn and meet the same high standards if they are to access the knowledge and skills necessary in their post-school lives. The Standards should be read as allowing for the widest possible range of students to participate fully from the outset, along with appropriate accommodations to ensure maximum participation of students with special education needs.*

At Creative Education Institute (CEI), we do just that. Our goal is to develop those programs that provide every student an opportunity to learn, and this goal is reflected in our mission….

> *To produce innovative learning solutions that enable people with educational differences to achieve academic, social, and professional success.*

We continue this mission by providing our customers and students programs crafted in the latest educational research, innovations, and technology. Our focus remains on the struggling learners, and the following alignments with CCSS reflect just that.

Mathematical Learning Systems
Component Descriptions

Mathematical Learning Systems is a computerized, multi-sensory instructional program that develops math skills through a series of visual, auditory and kinesthetic exercises. The program's Concept Building instruction helps students to learn mathematical concepts and processes, while the Fluency instruction improves the students' automaticity with math facts.

Creative Education Institute provides each MLS lab the latest version of the software, the Teacher's Manual and the MLS Masters manual. The MLS Masters include masters for (optional) written placement tests, progress tracking sheets, worksheets, and parameter guides.

CEI also offers materials to strengthen and extend the students' learning experience:

- **Math Magic:** An individual or group activity that uses higher order thinking skills to complete six intertwined equations. Number banks help the students to solve the puzzles. These math squares require the students to use estimation, logic and sequencing skills.

- **Drawing Conclusions:** A printed activity that encourages visualization and higher order thinking skills to solve word problems. These activities complement the word problems that the MLS program uses. Students can complete the activities individually, or teachers can encourage collaborative problem solving by placing the students in groups.

- **Fact Match:** An activity that provides students with practice of basic mathematical facts and operations. Practice leads to fluency, which enables students to learn more complex mathematical processes.

- **Flash Cards:** Cards that help students become more fluent on addition, subtraction, multiplication and division math facts. Using the cards can also help teachers determine where students should begin in the Fluency Stage of Mathematical Learning Systems.

- **Digit's Widgets:** A web-based application that allows students to develop their ability to recall math facts, which in turn provides fast access to the information required to solve more complex math problems. Presented in an arcade video game style reminiscent of the popular Tetris, Digit's Widgets allows students to further develop fact fluency by providing practice solving basic addition, subtraction, multiplication, and division facts.

- **Word Problems:** Written word problems that may be used in addition to the word problems already found in the MLS program.

Operations and Algebraic Thinking Grade 3 Commons Core State Standard Operations and Algebraic Thinking	Mathematical Learning Systems Program/Instructional Activity
Represent and solve problems involving multiplication and division.	

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.	Concept Building
	     Number Operations: Multiplication
	
	Fluency: Multiplication
	     SHARE
	
	Word Problem Worksheets
	
	Math Magic
	
	Drawing Conclusions

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.	Concept Building
	     Number Operations: Division
	
	Fluency: Division
	     SHARE
	
	Word Problem Worksheets
	
	Math Magic
	
	Drawing Conclusions

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.	Concept Building
	     Number Operations: Multiplication
	     Number Operations: Division
	
	Fluency
	     Multiplication
	          SHARE
	          Blank Out
	     Division
	          SHARE
	          Blank Out
	
	Word Problem Worksheets
	
	Math Magic

Operations and Algebraic Thinking Grade 3 Commons Core State Standard Operations and Algebraic Thinking	Mathematical Learning Systems Program/Instructional Activity

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: $8 \times ? = 48$, $5 = ?/3$, $6 \times 6 = ?$	Concept Building
	      Number Operations: Multiplication
	      Number Operations: Division
	Fluency
	      Multiplication
	            SHARE
	            Blank Out
	      Division
	            SHARE
	            Blank Out
	Word Problem Worksheets
	Fact Match
	Math Magic
	Digit's Widgets

Understand properties of multiplication and the relationship between multiplication and division.	

5. Apply properties of operations as strategies to multiply and divide. For example, apply commutative, associative, and distributive.	Concept Building
	      Number Operations: Multiplication*
	      Number Operations: Division*
	Fluency*
	Math Magic*
	Drawing Conclusions*
	
	*Distributive property not included

Operations and Algebraic Thinking Grade 3 Commons Core State Standard Operations and Algebraic Thinking	Mathematical Learning Systems Program/Instructional Activity

6. Understand division as an unknown-factor problem. For example, find 32/8 by finding the number that makes 32 when multiplied by 8.	Concept Building
	     Number Operations: Multiplication
	     Number Operations: Division
	Fluency
	     Multiplication
	          SHARE
	          Blank Out
	     Division
	          SHARE
	          Blank Out
	Drawing Conclusions
	Math Magic

Multiply and divide within 100
 	
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 2 two one-digit numbers.
	Concept Building
	     Number Operations: Multiplication
	     Number Operations: Division
	Fluency
	     Multiplication
	          SHARE
	          Echo
	          Blank Out
	          Number Search
	          Quick Pick
	          Quick Answer
	     Division
	          SHARE
	          Echo
	          Blank Out
	          Number Search
	          Quick Pick
	          Quick Answer
	Word Problem Worksheets
	Drawing Conclusions
	Math Magic
	Fact Match
	Digit's Widgets

Operations and Algebraic Thinking Grade 3 Commons Core State Standard Operations and Algebraic Thinking	Mathematical Learning Systems Program/Instructional Activity
Solve problems involving the four operations, and identify and explain patterns in arithmetic.	
8. Solve two step word problems using the four operations. Represent these problems using equations with a letter standing for an unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	Concept Building 　　　Number Operations: Multiplication 　　　Number Operations: Division 　　　Using Whole Numbers: Estimation Word Problem Worksheets Drawing Conclusions
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.*	Concept Building 　　　Understanding Numbers 　　　　　Patterns and Counting 　　　　　　　0-20 　　　　　　　21-99 　　　　　　　100-999
Number and Operations in Base Ten: Use place value understanding and properties of operations to perform multi-digit arithmetic.	
1. Use place value understanding to round whole numbers to the nearest 10 or 100.	Concept Building 　　　Using Whole Numbers: Estimation 　　　　　Rounding to the Nearest Ten 　　　　　Rounding to the Nearest Hundred

Operations and Algebraic Thinking Grade 3 Commons Core State Standard Operations and Algebraic Thinking	Mathematical Learning Systems Program/Instructional Activity

2. Fluently add and subtract within 1000 using strategies and algorithms based upon place value, properties of operations, and/or the relationship between addition and subtraction.	Concept Building
	    Number Operations: Addition
	    Number Operations: Subtraction
	    Using Whole Numbers: Estimation
	        Rounding to the Nearest Ten
	        Rounding to the Nearest Hundred
	
	Fluency
	    Addition
	        SHARE
	        Echo
	        Blank Out
	        Number Search
	        Quick Pick
	        Quick Answer
	
	    Subtraction
	        SHARE
	        Echo
	        Blank Out
	        Number Search
	        Quick Pick
	        Quick Answer
	
	Word Problem Worksheets
	
	Drawing Conclusions
	
	Fact Match
	
	Digit's Widgets

Operations and Algebraic Thinking Grade 3 Commons Core State Standard Operations and Algebraic Thinking	Mathematical Learning Systems Program/Instructional Activity

3. Multiply one-digit whole numbers by multiples of 10 in the range 10-90 using strategies based on place value and properties of operations.	Concept Building
	    Number Operations: Multiplication
	
	Fluency
	    Multiplication
	        SHARE
	        Echo
	        Blank Out
	        Number Search
	        Quick Pick
	        Quick Answer
	
	Word Problem Worksheets
	
	Drawing Conclusions
	
	Fact Match
	
	Math Magic
	
	Digit's Widgets

Number and Operations-Fractions: Develop understanding of fractions as numbers.	

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.	Concept Building
	    Understanding Fractions
	    Fraction Operations

2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.
 	
  a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.
 	
  b. Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.
	Concept Building
	    Understanding Fractions*
	
	*Fractions represented as part of a cube train rather than a number line.

Operations and Algebraic Thinking Grade 3 Commons Core State Standard Operations and Algebraic Thinking	Mathematical Learning Systems Program/Instructional Activity

3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
 	
a. Understand two fractions as equivalent (equal) if they are the same size or the same point on a number line.
 	
b. Recognize and generate simple equivalent fractions, e.g., 1/2=2/4, 4/6=2/3. Explain why the fractions are equivalent by using a visual fraction model.
 	
c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form of 3/1; recognize that 6/1=6; locate 4/4 and 1 at the same point of a number line diagram.
 	
d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols <, =, or >, and justify the conclusions by using a visual fractions model.
	Concept Building
	    Understanding Fractions
	        Equivalent Fractions
	        Comparing Fractions
	        Simplifying Fractions