

# Exploring Innovative Techniques for Teaching Arithmetic Using the (CRA) Approach

## **MANIPULATIVE IMAGES ONLY**

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# Place Value

**Precise Identifiers**

Value	→	100		
Place	→	Hundreds	30	6
Color	→	RED	Blue	Green

**Precise** names of places to help eliminate confusion between place and value.



**Place Value: Every Number Represents A Value  
And Has Its Own Place**

# Addition Strategies

**Specific** colors for each value helps with subitizing and processing issues.

**Specific** values help teach addition strategies, rather than counting strategies.

$$3 + 4 = 7$$



Focus on **building the equal sign** helps prepare students for algebraic thinking and solving for unknowns.



# Multiplication Strategies

		Using Language & Place Value Notation	Clear Modeling
$\begin{array}{r} 12 \\ \times 13 \\ \hline 36 \\ 120 \\ \hline 156 \end{array}$	Expand →	$\begin{array}{r} 10 + 2 \\ 10 + 3 \\ \hline 30 + 6 \\ 100 + 20 \\ \hline 100 + 50 + 6 \end{array}$	$\begin{array}{r} 10 + 2 \\ \hline \begin{array}{ c } \hline \text{3} \\ \hline \end{array} \\ + \\ \begin{array}{ c } \hline \text{10} \\ \hline \end{array} \end{array}$

**Explicit Instruction** ( **Clear Modeling**  
**Precise Verbal & Written Expression**  
**Comprehensive Manipulatives** ) = *Mastery*

# Division Strategies

## Precise Verbal & Written Expression

How many 13's can we count out of 156?

$$13 \times 10 = 130$$

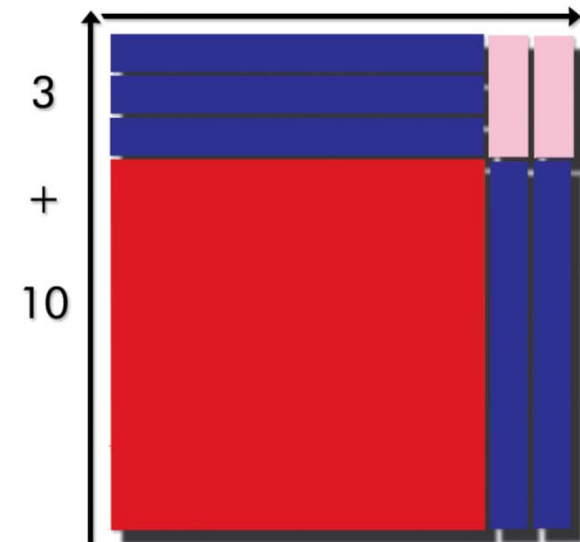
$$13 \times 2 = 26$$

This explains why the 6 comes down and eliminates the idea of there being a 15 in 156.

$$\begin{array}{r}
 2 \\
 \overline{)156} \\
 \underline{130} \\
 26 \\
 \underline{26} \\
 0
 \end{array}$$

## Clear Modeling

$$10 + 2$$



$$\text{Explicit Instruction} \left( \begin{array}{l} \text{Clear Modeling} \\ \text{Precise Verbal \& Written Expression} \\ \text{Comprehensive Manipulatives} \end{array} \right) = \text{Mastery}$$

# Algebra Strategies

The FOIL method can be confusing

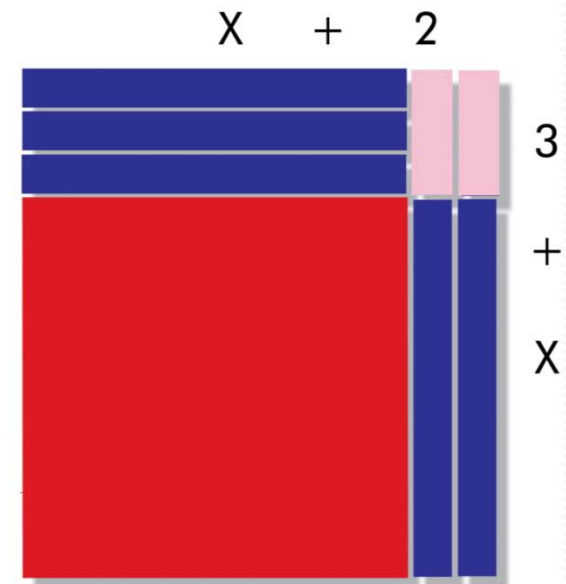
$$(X + 2)(X + 3)$$

$$X^2 + 5X + 6$$

Using Language & Place Value Notation

$$\begin{array}{r} (X + 2) \\ (X + 3) \\ \hline 3X + 6 \\ X^2 + 2X \\ \hline X^2 + 5X + 6 \end{array}$$

Clear Modeling



**Explicit Instruction** ( **Clear Modeling**  
**Precise Verbal & Written Expression**  
**Comprehensive Manipulatives** ) = *Mastery*

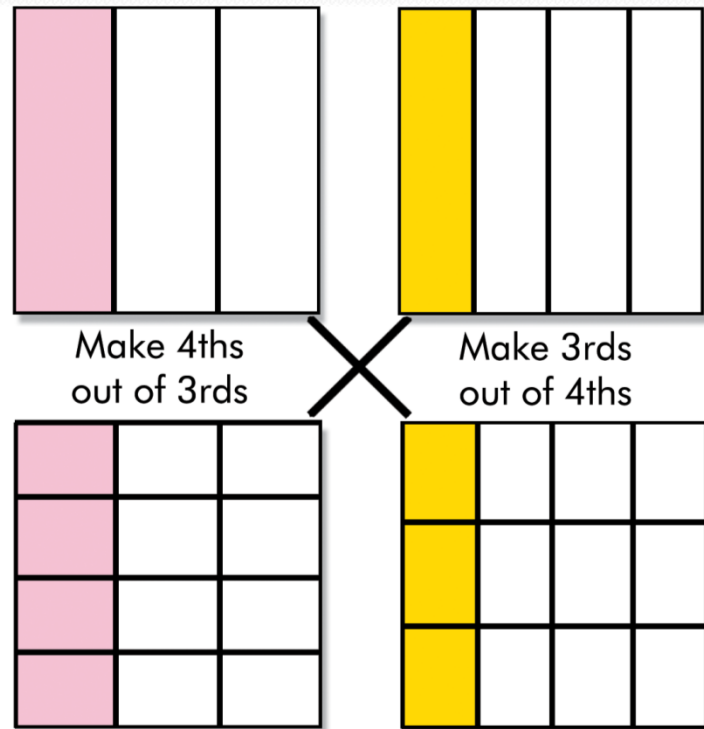


# Fraction Strategies

$$\frac{1}{3} + \frac{1}{4} =$$

Make 4ths out of 3rds ~~X~~ Make 3rds out of 4ths

$$\frac{4}{12} + \frac{3}{12} = \frac{7}{12}$$





# About the Speakers

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Dan and Joe both share a love of teaching and math. Both are national speakers and have presented at NCTM's national conference previously.

## Recommended Resources:

Institute of Educational Sciences [ies.ed.gov](http://ies.ed.gov)  
Mastery Educational Services [www.masteryed.com](http://www.masteryed.com)