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### The CCSSM Standards

- \* K - Fluently add and subtract within 5.
- \* 1- Add and subtract within 20, demonstrating fluency for addition and subtraction within 10.
- \* 2 - Fluently add and subtract within 20 using mental strategies. By the end of Grade 2, know **from memory** all sums of two one digit numbers.
- \* Fluently multiply and divide within 100, using strategies, such as the relationship between multiplication and division or properties of operations. By the end of Grade 3, know **from memory** all products of two one digit numbers.

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### Process

- \* Students come to understand the meaning of operations through direct modeling.
- \* Students develop the ability to use counting strategies to solve problems involving basic facts.
- \* Students experience and internalize properties of operations and develop the ability to use relational thinking to solve basic fact problems.
- \* Students practice using relational thinking and come to know **"from memory"**.

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### Meaning of Addition and Subtracting p. 88

- \* Start - Change - End putting in end unknown
- \* Start - Change - End putting in change unknown
- \* Start - Change - End putting in start unknown
- \* Start - Change - End taking out end unknown
- \* Start - Change - End taking out change unknown
- \* Start - Change - End taking out start unknown

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### Meaning of Addition and Subtractions p. 88

- \* Part - Part - Whole whole unknown
- \* Part - Part - Whole one part unknown
- \* Part - Part - Whole both parts unknown
- \* Large set - Small set - Difference difference unknown
- \* Large set - Small set - Difference small set unknown
- \* Large set - Small set - Difference large set unknown

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### Other Thing That Matter

- \* Labels (units matter) e.g., 6 nickels + 5 dimes
- \* Wording (language and ordering of information)
- \* Developing problem sets in context

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## Meaning of Multiplication and Division p. 89

- \* Number of objects per group - Number of groups - Total number of objects total number of objects unknown
- \* Number of objects per group - Number of groups - Total number of objects number of objects per group unknown
- \* Number of objects per group - Number of groups - Total number of objects number of groups unknown
- \* Length - Width - Area area unknown
- \* Length - Width - Area dimension unknown
- \* Rows - Columns - Cells (objects) cells objects unknown
- \* Row - Columns - Cells (objects) rows or columns unknown

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## Meaning of Multiplication and Division p. 89

### Multiplicative Comparison

- \* Ratios
- \* Rates (different units - conversions)
- \* Proportions

Know both quantities known - find the comparison (ratio or rate)

Comparison and one quantity known - find the other quantity

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## Other Thing That Matter

- \* Labels (units)
- \* Context (discrete/continuous)
- \* Developing problem sets in context

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## Counting

- \* Counting on
- \* Counting back
- \* Skip counting

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## Properties of Operation

- \* Identities (0 and 1)
- \* Inverses
- \* Commutative
- \* Associative
- \* Distributive
- \* Closure (extending number system)

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## Properties of Equality

- \* Reflexive  $a = a$  (units)
- \* Symmetric  $a = b$  then  $b = a$
- \* Transitive  $a = b$  and  $b = c$  then  $a = c$
- \* Additive property of equality  $a = b$  then  $a + c = b + c$
- \* Multiplicative property of equality  $a = b$  then  $ac = bc$

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## Practice

### Games

- \* Inside Outside
- \* Beat the Calculator
- \* Make a Ten
- \* I have who has

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## Practice

### Technology Tools

- \* Measures input speed
- \* Adjusts to student level
- \* Game format
- \* Immediate feedback
- \* "Teaches"
- \* Provides measure of fluency for each student and the class

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## Question, Comments, Funny Stories

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