

Drop the Timer and Step Away from the Flashcards

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Fluency versus Memorization

- ◆ What is Fluency?
- ◆ What is Memorization?
- ◆ How are these ideas alike?
- ◆ How are these ideas different?
- ◆ What do the Standards say about fluency and memorization?

Standards

- ◆ K.OA.5 Fluently add and subtract within 5.
- ◆ 1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10...
- ◆ 2.OA.2 Fluently add and subtract within 10 using mental strategies. By the end of grade 2, know from memory all sums of two one-digit numbers.
- ◆ 2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations and/or the relationship between addition and subtraction.

Specific Strategies (as stated in the Standards)

- ◆ Counting on
- ◆ Making ten
- ◆ Decomposing a number leading to a ten
- ◆ Using the relationship between addition and subtraction
- ◆ Creating equivalent but easier or known sums

Other Addition Strategies

- ◆ Doubles
- ◆ Doubles plus 1
- ◆ Add with 10
- ◆ Add with 9

Let's look at each strategy!

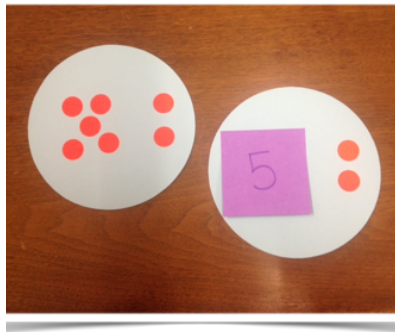


Strategy Chart

	1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10	11
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Counting On

- ◆ Shift from “counting all” to “counting on”
- ◆ Subitizing plates and dots
- ◆ “Cup and up”
- ◆ Dice games

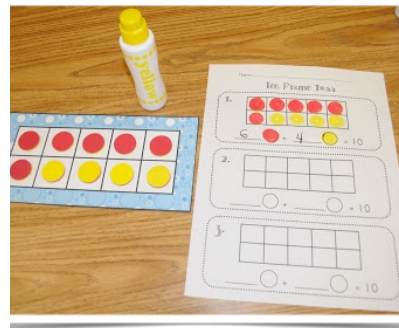


Strategy Chart Counting Up

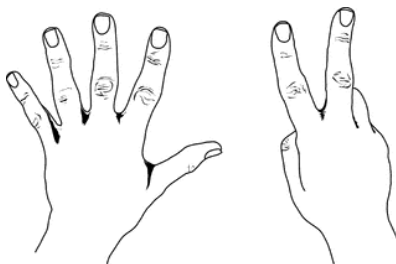
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Make a Ten

- ◆ Ten frames
(Roll die, fill the frame)
- ◆ Two-color Counters
- ◆ Paint Palettes
- ◆ Fingers
(How many fingers don't you see?)
- ◆ "Shake and Spill"
- ◆ Playing Cards



Make a Ten



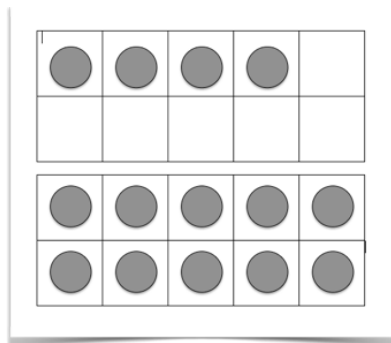
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Strategy Chart Make a Ten

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Add with Ten

- ◆ Double Ten Frames
- ◆ Hundreds Chart
- ◆ Base Ten Blocks













Strategy Chart Add with Ten

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Doubles

- ◆ Dominoes
- ◆ Towers of linking cubes
- ◆ Class-created “anchors”

DOUBLES FACTS

 Shoes Fact 1+1=2	 Cat Fact 2+2=4
 Ladybug Fact 3+3=6	 Spider Fact 4+4=8
 Gloves Fact 5+5=10	 Dozen Eggs Fact 6+6=12
 Days Fact 7+7=14	 Crayon Fact 8+8=16
 Domino Fact 9+9=18	 Hand and Foot Fact 10+10=20

Strategy Chart Doubles

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Add with Nine

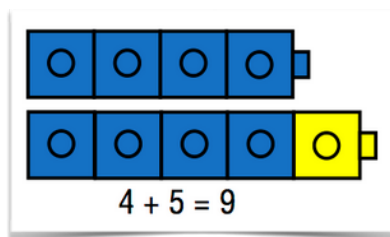
- ◆ $n + 9 = ?$
- ◆ Think...
 $n + 10$... But one less
- ◆ $5 + 9 = ?$
Think...
IF $5 + 10 = 15$
THEN... $5 + 9 = 14$
- ◆ Base Ten blocks
- ◆ Hundreds Chart
- ◆ Number Talks

Strategy Chart Add with Nine

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Doubles Plus One (Neighbor Numbers)

- ◆ $4 + 5 = ?$
Think $4 + 4$, and 1 more
- ◆ Linking Cubes
- ◆ Number Talks
IF $6 + 6 = 10$
THEN $6 + 7 = 11$



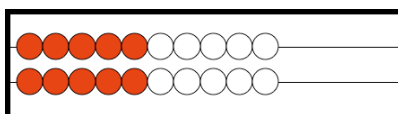
Strategy Chart Doubles Plus One

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Complete a Ten

- ◆ For the facts that might not be solved using one of the other strategies.
- ◆ Double ten frames
- ◆ Rekenrek
- ◆ Decompose one number, thinking about how to “complete a ten”
- ◆ This thinking paves the way for other mental math and regrouping understanding.

Complete a Ten



5 2
 $8 + 5$ $37 + 25$
 $10 + 3 = 13$ $40 + 22 = 62$
 $3:45 + 75 \text{ min}$ $1 \text{ ft } 8 \text{ in} + 10 \text{ in}$
 $4:00 + 60 \text{ min} = 5:00$ $2 \text{ ft } 6 \text{ in}$

<http://www.mathcoachscorner.com/>

Strategy Chart Doubles Plus One

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3 Steps to Fact Mastery

Arthur J. Baroody (2006)
Gina King & Jennifer M. Bay-Williams (2006, 2015)

- ◆ Modeling and/or counting to find the answer
- ◆ Deriving answers using reasoning strategies based on known facts
- ◆ Mastery (efficient production of answers)

Be intentional!

- ◆ Make your plan to use strategies (Pacing guide)
- ◆ Learning Centers
- ◆ Choose you numbers carefully
- ◆ Number talks
“IF I know... THEN I also know ... “
- ◆ Dice, dominoes, playing cards

Why is this important to me?

- ◆ My role as math leader
- ◆ Meet Max.



Math Anxiety

- ◆ Math has never been my favorite subject. To be honest, it is the subject that I cannot stand. My dislike with math began in my early years. Doing times test in school was never the highlight of my day, because I never could finish the tests and I always seemed to miss so many of the problems. B4 (opening statement)
- ◆ I remember in second grade I was terrified of the timed multiplication tests. These tests filled me with anxiety and fear. In second grade I was still using my fingers to help with simple addition and subtraction so the thought of having to memorize multiplication tables was horrifying. B20

What about timed tests?

- ◆ Accuracy rather than speed
- ◆ Track personal progress
- ◆ Highlighter compromise
- ◆ What is best for your students?

References

- ◆ Baroody, A. (2006). Why children have difficulty mastering the basic number combinations and how to help them. *Teaching Children Mathematics*, 13 (1), 22-31.
- ◆ Boaler, J. (2014). In my opinion: Research suggests that timed tests cause math anxiety. *Teaching Children Mathematics*, 20, (8), 467-474.
- ◆ Boaler, J. (2015). Fluency without fear. *YouCubed*. Retrieved from <http://www.youcubed.org/fluency-without-fear/>
- ◆ King, G. & Bay-Williams, J. (2015). Three steps to mastering multiplication facts. *Teaching Children Mathematics*, 21 (9), 548-559.
- ◆ mathcoachscorner.com
- ◆ The University of Arizona's Progressions Document <http://ime.math.arizona.edu/progressions/>