Drop the Timer and Step Away from the Flashcards

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Increasing Fact Fluency

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The Power of Strategies

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

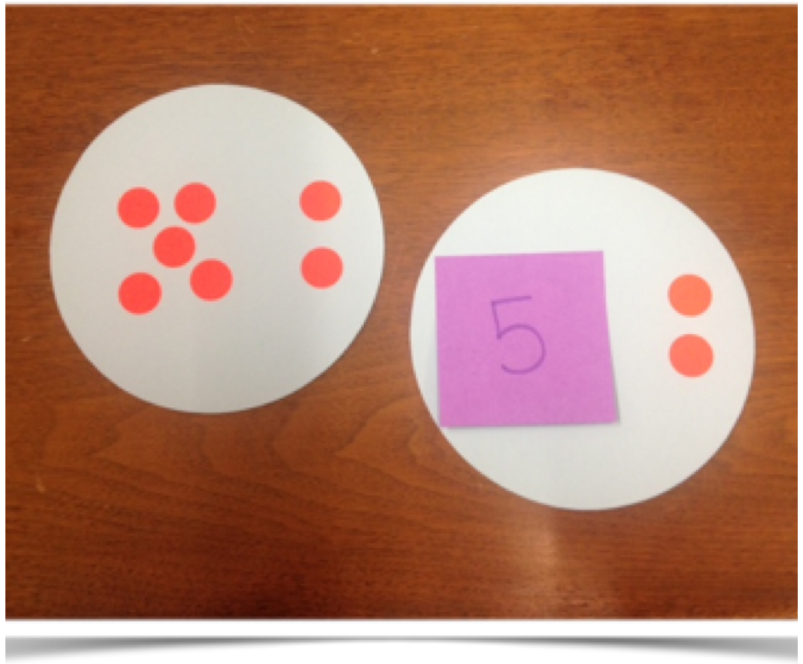
Let's look at each strategy!

Strategy Chart

	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	7	8	9	10	11	12	13
4	4	5	6	7	8	9	10	11	12	13	14
5	5	6	7	8	9	10	11	12	13	14	15
6	6	7	8	9	10	11	12	13	14	15	16
7	7	8	9	10	11	12	13	14	15	16	17
8	8	9	10	11	12	13	14	15	16	17	18
9	9	10	11	12	13	14	15	16	17	18	19
10	10	11	12	13	14	15	16	17	18	19	20

Counting On

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



Strategy Chart Counting Up

	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	7	8	9	10	11	12	13
4	4	5	6	7	8	9	10	11	12	13	14
5	5	6	7	8	9	10	11	12	13	14	15
6	6	7	8	9	10	11	12	13	14	15	16
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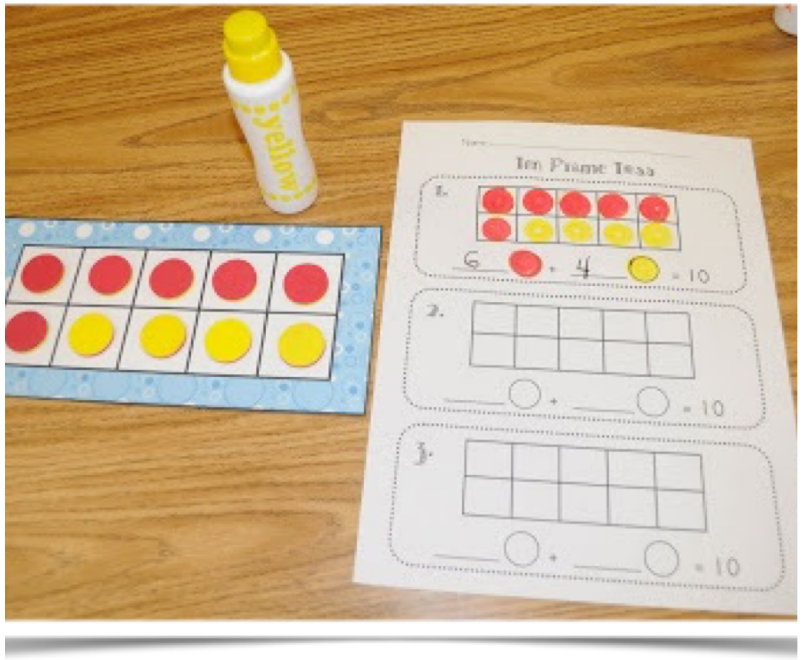
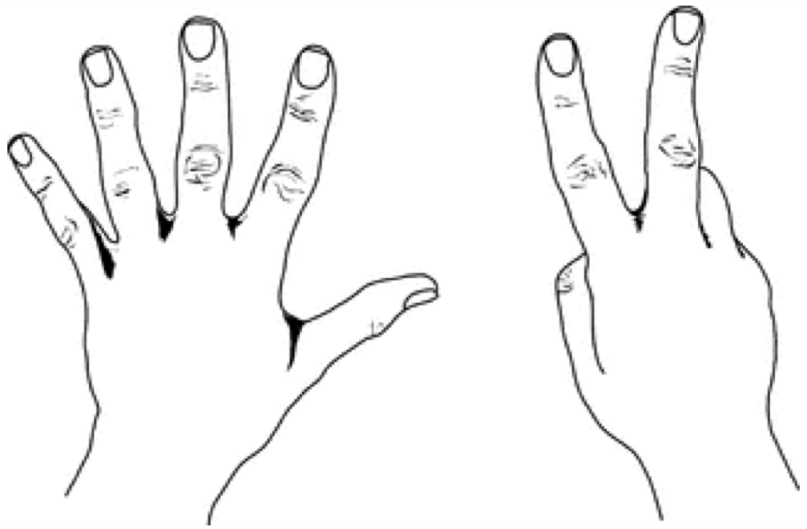
10	10	11	12	13	14	15	16	17	18	19	20

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



http://etc.usf.edu/clipart/

Strategy Chart
Make a Ten

	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	7	8	9	10	11	12	13
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8	8	9	10	11	12	13	14	15	16	17	18
9	9	10	11	12	13	14	15	16	17	18	19
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Add with Zero

- Zero is more abstract
- Empty containers
- Identity Property of Addition

Add with Zero

	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	7	8	9	10	11	12	13
4	4	5	6	7	8	9	10	11	12	13	14
5	5	6	7	8	9	10	11	12	13	14	15
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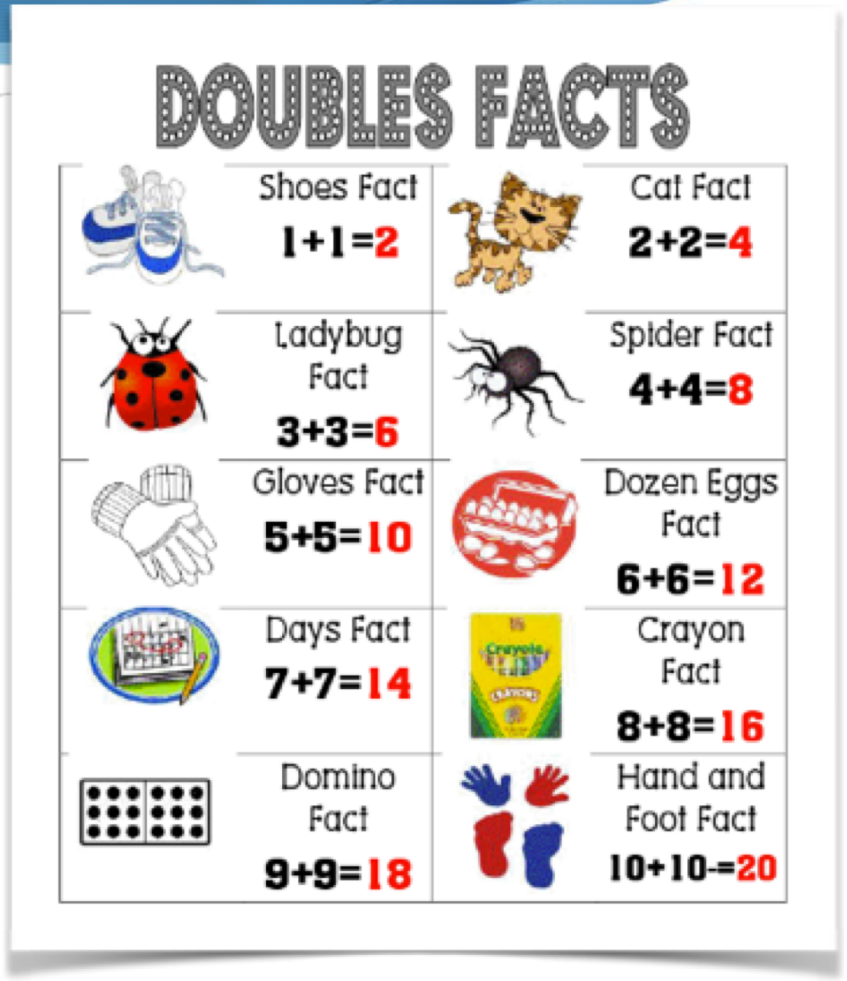
Doubles

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



Strategy Chart
Doubles

	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
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4	4	5	6	7	8	9	10	11	12	13	14
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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

	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
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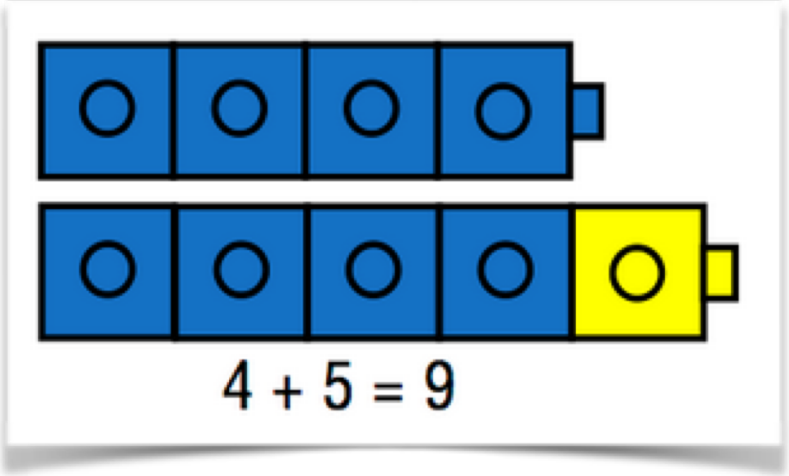
Doubles Plus/Minus One (Neighbor Numbers)

- 4 + 5 = ? Think 4 + 4, and 1 more
- Linking Cubes
- Number Talks
  IF 6 + 6 = 12
  THEN 6 + 7 = 13



Strategy Chart
Doubles Plus/Minus One

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0	0	1	2	3	4	5	6	7	8	9	10
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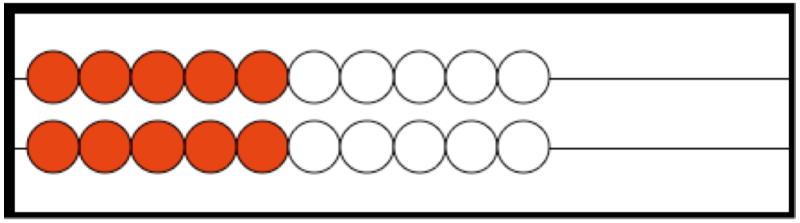
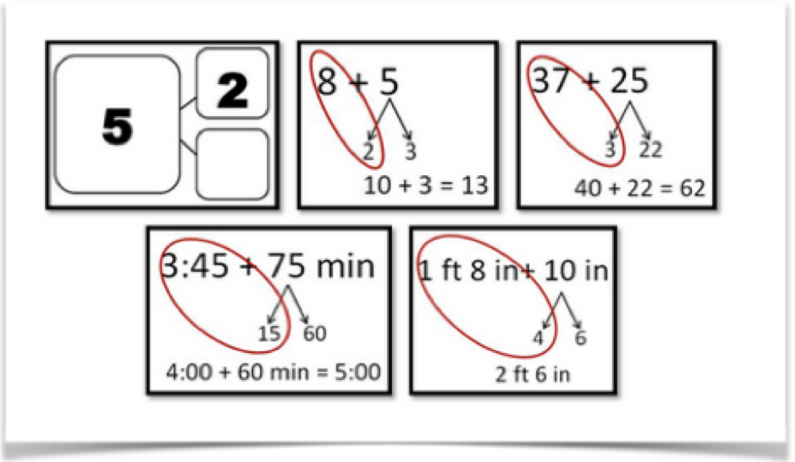
Add With Ten (Complete a Ten)

- 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.

Add With Ten (Complete a Ten)





http://www.mathcoachscorner.com/

Strategy Chart
Add With Ten (Complete a Ten)

	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
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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

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
- What is best for your students?

References

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