

# Mathematics Fluency for Grades K-2



Inspired Instruction, LLC



# Agenda

- Admit Ticket
- Fluency Expectations
- Fluency vs. Knowing from Memory
- Fluency – Conceptual, Procedural and Fact
- Strategies for Accomplishing Fluency
- Assessing Fluency
- Debrief and Discuss



# Fluency Expectations

Grade	Standard	Expected Fluency
K	K.OA.A.5	Add/Subtract within 5
1	1.OA.C.6	Add/Subtract within 10
2	2.OA.B.2 2.NBT.B.5	Add/Subtract within 20 (Know single digit sums from memory) Add/Subtract within 100
3	3.OA.C.7 3.NBT.A.2	Multiply/Divide within 100 (Know single digit products from memory) Add/Subtract within 1000
4	4.NBT.B.4	Add/Subtract within 1,000,000
5	5.NBT.B.5	Multi-digit multiplication



# Brainstorming Session



How do you incorporate fluency development in your classroom?

*Share your thoughts with a partner or partners.*

Group discussion will follow.





# Subitizing

- Buttons
- Subitizing Cards
- Dominoes



<https://www.youtube.com/watch?v=TZvITXVqwtS>



# Decomposing Ten

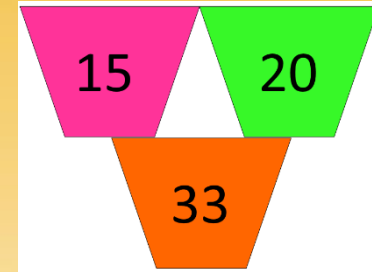
A rainbow diagram is an excellent way to identify all the number facts that make 10. Students make the facts by adding the numbers at opposite ends of each rainbow colour. This strategy is sometimes called 'make 10' or 'addition facts to 10'.



Making Ten <https://www.youtube.com/watch?v=A7bEhBCebOY>



# Find the Missing Number



Name \_\_\_\_\_ Date \_\_\_\_\_

Gr. 2 Activity - Find the Missing Number - Side 1  
Choose an "Answer Card" from the bag. Write that answer on the line for each equation. Hint: Use inverse operation.

$15 + \square = \underline{\quad}$	$6 + \square = \underline{\quad}$
$55 - \square = \underline{\quad}$	$93 - \square = \underline{\quad}$
$11 + \square = \underline{\quad}$	$9 + \square = \underline{\quad}$
$65 - \square = \underline{\quad}$	$100 - \square = \underline{\quad}$
$13 + \square = \underline{\quad}$	$5 + \square = \underline{\quad}$

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Activity - Find the Missing Number - Side 2

$1 + \square = \underline{\quad}$	$4 + \square = \underline{\quad}$
$85 - \square = \underline{\quad}$	$50 - \square = \underline{\quad}$
$2 + \square = \underline{\quad}$	$7 + \square = \underline{\quad}$
$14 + \square = \underline{\quad}$	$12 + \square = \underline{\quad}$
$75 - \square = \underline{\quad}$	$8 + \square = \underline{\quad}$

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Activity



# Interviews

## Protocols to quickly assess fluency:

### Protocol A. Assess fluency

1. Write  $4 \times 5$  on a card [*point at card*].  
What does  $4 \times 5$  mean?
2. What is the answer to  $4 \times 5$ ?
3. How did you find the answer to  $4 \times 5$ ?  
Could you find it another way?
4. If your friend was having trouble remembering this fact, what strategy might you suggest to him or her?

### Protocol B. Assess flexibility and strategy selection

1. What is  $8 + 5$ ?
  2. How can you use  $8 + 2$  to help you solve  $8 + 5$ ?
- OR
1. How can you use  $3 \times 7$  to solve  $6 \times 7$ ?

### Protocol C. Assess use of appropriate strategy (adapted from Henry and Brown 2008)

#### Probes

What is  $7 + 8$ ?

How did you figure it out? [*Ask regardless of how quickly or accurately they solve the fact.*]

#### Codes

- R = Recall
- A = Automatic (within 3 seconds)
- M10 = Making 10 Strategy
- ND = Near Doubles Strategy
- D = Some other derived fact strategy
- CO = Counting on
- CA = Counting all
- MCA = Modeling and counting all

From Assessing Basic Fact Fluency By Gina Kling and Jennifer M. Bay-Williams



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# Sprints – Grade 1

NYS COMMON CORE MATHEMATICS CURRICULUM

Lesson 2 Number Bond Dash 1•1

Name \_\_\_\_\_ Date \_\_\_\_\_

Directions: Do as many as you can in 60 seconds. Write the amount you finished here: \_\_\_\_\_

Number Bond Dash!

1. 5  
4 □

2. 5  
5 □

3. 5  
4 □

4. 5  
3 □

5. 5  
4 □

6. 5  
□ 3

7. 5  
□ 2

8. 5  
□ 4

9. 5  
□ 1

10. 5  
□ 2

11. 5  
□ 0

12. 5  
□ 1

13. 5  
2 □

14. 5  
□ 3

15. 5  
□ 4

16. 5  
□ 5

17. 5  
□ 4

18. 5  
□ 3

19. 5  
□ 2

20. 5  
□ 1

21. 5  
5 □

22. 5  
□ 0

23. 5  
1 □

24. 5  
3 □

25. 5  
2 □

engage ny

COMMON CORE

Lesson 2: \_\_\_\_\_  
Date: \_\_\_\_\_

Review about unranked numbers in varied configurations using number bonds. 6/24/13

NYS COMMON CORE MATHEMATICS CURRICULUM

Lesson 3 Number Bond Dash 1•1

Name \_\_\_\_\_ Date \_\_\_\_\_

Directions: Do as many as you can in 60 seconds. Write the amount you finished here: \_\_\_\_\_

Number Bond Dash!

1. 5  
4 □

2. 5  
5 □

3. 5  
4 □

4. 5  
3 □

5. 5  
4 □

6. 5  
□ 3

7. 5  
□ 2

8. 5  
□ 4

9. 5  
□ 1

10. 5  
□ 2

11. 5  
□ 0

12. 5  
1 □

13. 5  
2 □

14. 5  
3 □

15. 5  
4 □

16. 5  
□ 5

17. 5  
□ 4

18. 5  
□ 3

19. 5  
□ 2

20. 5  
□ 1

21. 5  
5 □

22. 5  
□ 0

23. 5  
1 □

24. 5  
3 □

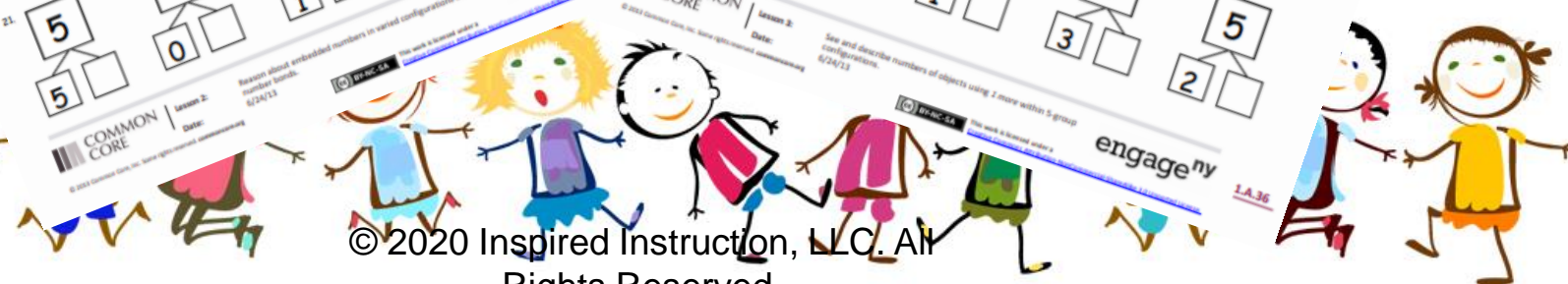
25. 5  
2 □

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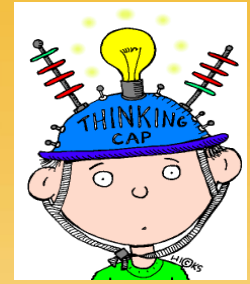
COMMON CORE

Lesson 3: \_\_\_\_\_  
Date: \_\_\_\_\_

See and describe numbers of objects using 1 more within 5 group configurations. 6/24/13



# Brainstorming Session



## Next Day Plan

**How will the types of strategies discussed in today's workshop affect your planning and delivery of instruction?**

*Share your thoughts with a partner or partners.*

Group discussion will follow.



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