hand2mind®

Math Fluency Intervention

Sample Lessons

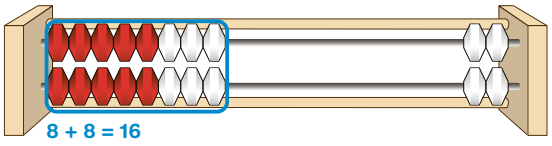
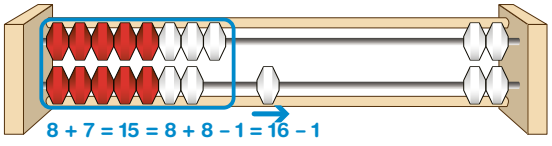
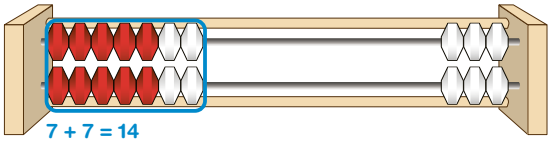
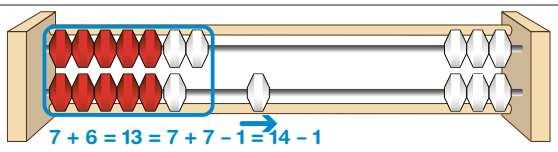
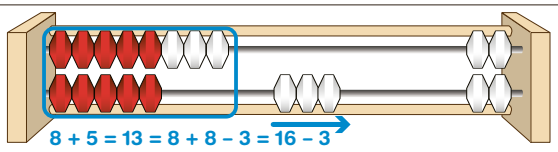
Build math fluency through Math Talks & Number Strings

Basic Addition/ Subtraction Facts

Number Strings

Use Doubles

17

8 + 8 Show 8 on top, 8 on the bottom	**Teacher:** *How many beads? How do you see them?* **Goal:** 16 beads; I know my doubles.	
8 + 7 Show 8 on top, 7 on the bottom	**Teacher:** *How many beads? How do you see them?* **Goal:** 15 beads; I know 8 + 8 = 16, but that is one too many. It is 15.	
7 + 7 Show 7 on top, 7 on the bottom	**Teacher:** *How many beads? How do you see them?* **Goal:** 14 beads; I know my doubles.	
7 + 6 Show 7 on top, 6 on the bottom	**Teacher:** *How many beads? How do you see them?* **Goal:** 13 beads; I know 7 + 7 is 14, and minus 1 is 13.	
8 + 5 Show 8 on top, 5 on the bottom	**Teacher:** *How many beads? How do you see them?* **Goal:** 13 beads; I know 8 and 8 is 16, but that is 3 too many. 16 – 3 = 13.	

Strategies Taught

- Counting On
- Counting Back
- Use the Five/Ten Structure
- Use Doubles
- Get to Ten
- Use Ten and Adjust
- Use Known Facts

Manipulatives included

- Picture and Dot Cards
- Ten-Frames
- Double Ten-Frames
- Rekenreks
- Open Number Lines
- Equations

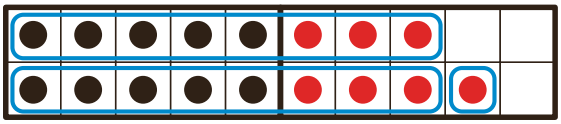
Basic Addition/ Subtraction Facts

Math Talks

8 + 9

Use Doubles

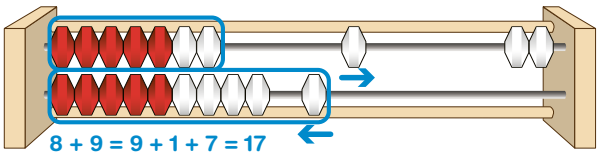
17; I know 9 is made up of 8 and 1, so I do 8 + 8, which is 16, and 1 more is 17.



8 + 9 = 8 + 8 + 1 = 17

Get to Ten

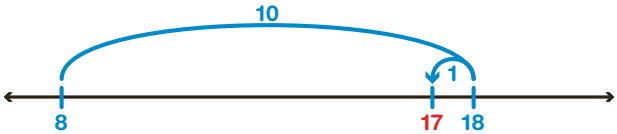
17; I take 1 from the 8 and give it to the 9. Then I do the problem 7 + 10, which is 17.



8 + 9 = 9 + 1 + 7 = 17

Use Ten and Adjust

17; I notice that 9 is close to 10, so I think 8 + 10 = 18. Then I subtract 1 to get to 17.



8 + 9 = 8 + 10 – 1 = 17

Use the Five/Ten Structure

17; I think about 8 as 5 and 3, and 9 as 5 and 4. So, 5 + 5 = 10, and 3 + 4 = 7, then 10 + 7 = 17.

Teacher Notes

Start the Math Talk by writing 8 + 9. Give students time to mentally solve the problem. Write all answers on the board and then have the students explain their thinking. Model student thinking using a manipulative that will help make the strategy clear for all students to access. Write any equations that represent the strategy.

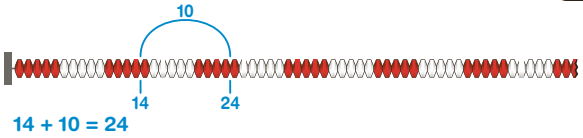
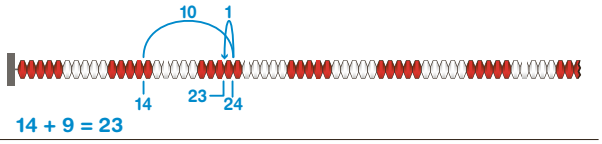
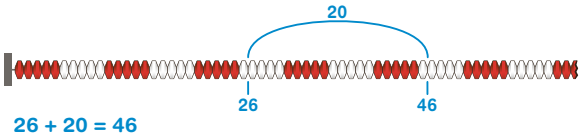
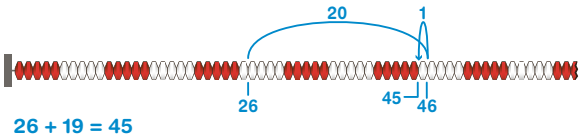
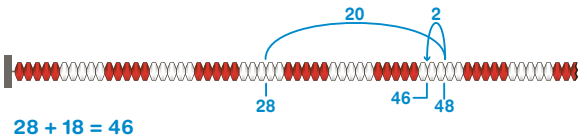
Facilitating Questions: **1.** Can you find two strategies that are similiar? How are they the same? **2.** Are there any strategies that are more efficient than another? Why? **3.** After observing other strategies, did you revise your thinking? How?

Multi-Digit Addition/ Subtraction Facts

Number Strings

Over and Adjust

19

14 + 10 Write problem	**Teacher:** *What is 14 + 10?* **Goal:** 24; I start at 14 and jump 10 to get to 24.	
14 + 9 Write problem	**Teacher:** *What is 14 + 9?* **Goal:** 23; I start at 14 and jump 10, which gets me to 24, but that is 1 too many, so I adjust 1 and land on 23.	
26 + 20 Write problem	**Teacher:** *What is 26 + 20?* **Goal:** 46; I start at 26 and jump 20 to get to 46.	
26 + 19 Write problem	**Teacher:** *What is 26 + 19?* **Goal:** 45; I start at 26 and jump 20 to get to 46, but I only need to go 19. I adjust 1 to get 45.	
28 + 18 Write problem	**Teacher:** *What is 28 + 18?* **Goal:** 46; I start at 28 and jump 20 to get to 48. Then I go back 2, which gets me to 46.	

Strategies Taught

- Counting On
- Counting Back
- Use the Five/Ten Structure
- Use Doubles
- Get to Ten
- Use Ten and Adjust
- Use Known Facts

Manipulatives included

- Picture and Dot Cards
- Ten-Frames
- Double Ten-Frames
- Rekenreks
- Open Number Lines
- Equations

Multi-Digit Addition/ Subtraction Facts

Math Talks

62 + 59

Give and Take

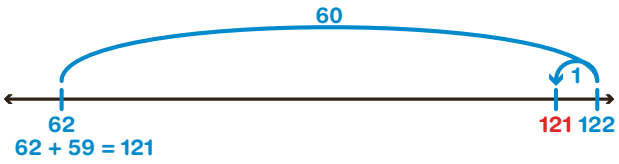
121; I notice that 59 is 1 away from 60. I take 1 from 62 and give it to 59 to make a new problem. I solve the problem 61 + 60, which is 121.

$$\begin{array}{r} 62 \\ -\ 1 \\ \hline 61 \end{array} \quad + \quad \begin{array}{r} 59 \\ +\ 1 \\ \hline 60 \end{array}$$

62 + 59 = 121

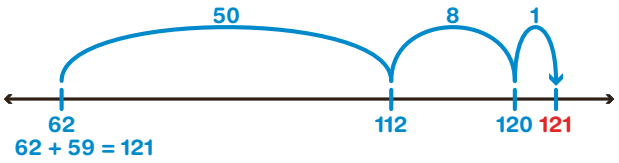
Over and Adjust

121; I think about 59 as 60. I start at 62 and jump 60 to get to 122. Then I have to adjust back 1 to get to 121.



Add a Friendly Number

121; I start at 62 and jump 50 to get to 112. Then I jump 8 to get to 120 and 1 more to get to 121.



Splitting

121; I think about 62 as 60 + 2, and 59 as 50 + 9. So, 60 + 50 = 110, and 2 + 9 = 11. Then, 110 + 11 = 121.

Teacher Notes

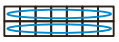
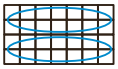
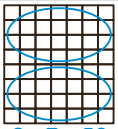
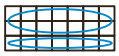
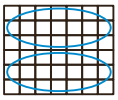
Start the Math Talk by writing 62 + 59. Give students time to mentally solve the problem. Write all answers on the board and then have the students explain their thinking. Model student thinking using a manipulative that will help make the strategy clear for all students to access. Write any equations that represent the strategy.

Facilitating Questions: **1.** Can you find two strategies that are similiar? How are they the same? **2.** Are there any strategies that are more efficient than another? Why? **3.** After observing other strategies, did you revise your thinking? How?

Basic Multiplication/ Division Facts

Number Strings

Double

2 x 7 Show a 2 x 7 array	**Teacher:** *How many squares? How do you know?* **Goal:** 14; I see 7 squares on the top row, and I just double it. So, 7 and 7 is 14.	 **7 + 7 = 14 = 2 x 7**
4 x 7 Show a 4 x 7 array	**Teacher:** *How many squares? How do you know?* **Goal:** 28; I know 2 rows of 7 is 14, and I just double it. So, 14 and 14 is 28.	 **4 x 7 = 28**
8 x 7 Show an 8 x 7 array	**Teacher:** *How many squares? How do you know?* **Goal:** 56; I know 4 rows of 7 is 28, and I just double it. So, 28 and 28 is 56.	 **8 x 7 = 56**
3 x 7 Show a 3 x 7 array	**Teacher:** *How many squares? How do you know?* **Goal:** 21; I know 2 rows of 7 is 14, so I just add another 7 to get 21.	 **3 x 7 = 21**
6 x 7 Show a 6 x 7 array	**Teacher:** *How many squares? How do you know?* **Goal:** 42; I know 3 rows of 7 is 21, so I just double it to get 42.	 **6 x 7 = 42**

Strategies Taught

- Double
- Use Partial Products
- Use Five Times
- Use Ten Times
- Double and Halve
- Multiply Up
- Partial Quotients
- Use Relationships

Manipulatives included

- Picture and Dot Cards
- Equations
- Open Number Lines
- Flexitable Grid Arrays
- Open Arrays
- Ratio Tables

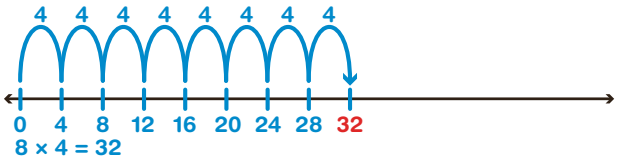
Basic Multiplication/ Division Facts

Math Talks

8 x 4

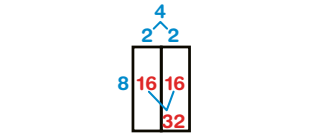
Skip Counting

32; I skip count 4, 8, 12, 16, 20, 24, 28, 32.



Double

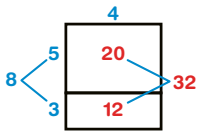
32; I know 8 x 2 is 16, so I just double it to get 32.



(8 x 2) + (8 x 2) = 16 + 16 = 32

Use Partial Products

32; I know 5 x 4 is 20 and 3 x 4 is 12, so 20 and 12 is 32.



(5 x 4) + (3 x 4) = 20 + 12 = 32

Double and Halve

32; I double 8 to get 16 and halve 4 to get 2. Then I solve the problem 16 x 2, which is 32.

Teacher Notes

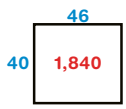
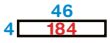
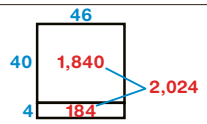
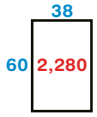
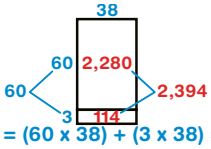
Start the Math Talk by writing 8 x 4. Give students time to mentally solve the problem. Write all answers on the board and then have the students explain their thinking. Model student thinking using a manipulative that will help make the strategy clear for all students to access. Write any equations that represent the strategy.

Facilitating Questions: **1.** Can you find two strategies that are similiar? How are they the same? **2.** Are there any strategies that are more efficient than another? Why? **3.** After observing other strategies, did you revise your thinking? How?

Multi-Digit Multiplication/ Division Facts

Number Strings

Use Partial Products

40 x 46 Write problem	**Teacher:** *What is 40 x 46?* **Goal:** 1,840; I think about 40 as 10 + 10 + 10 + 10. I know 46 x 10 is 460. I double it to get 920 and double again to get 1,840.	 40 x 46 = 1,840
4 x 46 Write problem	**Teacher:** *What is 4 x 46?* **Goal:** 184; I double 46 to get 92 and double 92 to get 184.	 4 x 46 = 184
44 x 46 Write problem	**Teacher:** *What is 44 x 46?* **Goal:** 2,024; I notice I could use the two problems from before. I think about 44 as 40 and 4. So, 40 x 46 and 4 x 46 is 1,840 + 184 = 2,024.	 44 x 46 = (40 x 46) + (4 x 46) = 2,024
60 x 38 Write problem	**Teacher:** *What is 60 x 38?* **Goal:** 2,280; I know 38 x 10 is 380. I need 6 of them to get to 2,280.	 60 x 38 = 2,280
63 x 38 Write problem	**Teacher:** *What is 63 x 38?* **Goal:** 2,394; I think about the 63 as 60 and 3. I know 60 x 38 is 2,280, and 3 x 38 is 114. 2,280 + 114 = 2,394.	 63 x 38 = (60 x 38) + (3 x 38) = 2,394

Strategies Taught

- Use Partial Products
- Double and Halve
- Factor and Group Flexibility
- Multiply Up
- Partial Quotients
- Use Relationships

Manipulatives included

- Equations
- Flexitable Grid Arrays
- Open Arrays
- Ratio Tables

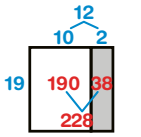
Multi-Digit Multiplication/ Division Facts

Math Talks

19 x 12

Use Partial Products

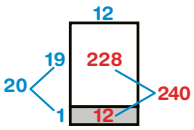
228; I think about 12 as 10 and 2. I multiply 19 x 10 to get 190 and 19 x 2 to get 38. So, 190 + 38 = 228.



19 x 12 = 228

Use Partial Products

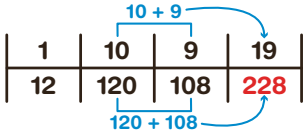
228; I think about 19 as 20. I multiply 20 x 12 to get 240. Then I subtract a group of 12 to get to 228.



19 x 12 = 228

Use Partial Products

228; I multiply 10 x 12 to get 120 and 9 x 12 to get 108. So, 120 and 108 is 228.



19 x 12 = 228

Double and Halve

228; I double 19 to get 38 and halve 12 to get 6. Then I double 38 to get 76 and halve 6 to get 3. Then I solve the problem 76 x 3, which is 228.

Teacher Notes

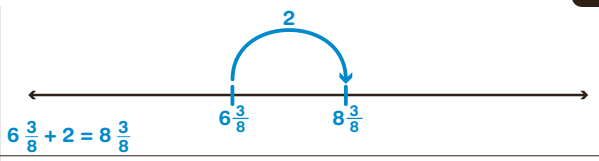
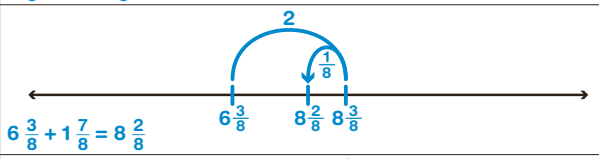
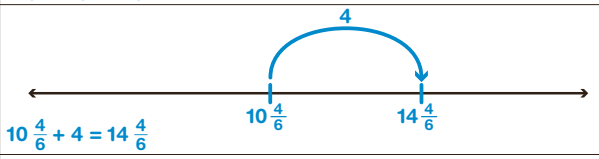
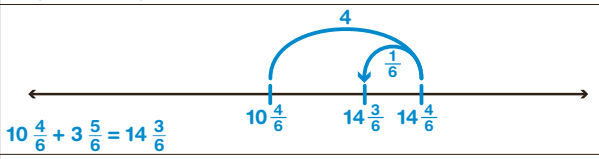
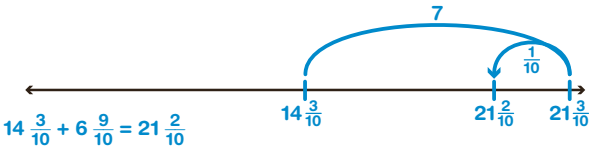
Start the Math Talk by writing 19 x 12. Give students time to mentally solve the problem. Write all answers on the board and then have the students explain their thinking. Model student thinking using a manipulative that will help make the strategy clear for all students to access. Write any equations that represents the strategy.

Facilitating Questions: **1.** Can you find two strategies that are similiar? How are they the same? **2.** Are there any strategies that are more efficient than the others? Why? **3.** After observing other strategies, did you revise your thinking? How?

Fraction/ Decimal Operations

Number Strings

Over and Adjust

$6\frac{3}{8} + 2$ Write problem	**Teacher:** *What is 6 3/8 + 2?* **Goal:** 8 3/8; I start at 6 3/8 and jump 2 to get to 8 3/8.	
$6\frac{3}{8} + 1\frac{7}{8}$ Write problem	**Teacher:** *What is 6 3/8 + 1 7/8?* **Goal:** 8 2/8; I notice that 1 7/8 is close to 2. I start at 6 3/8 and jump 2 to get to 8 3/8. Then I adjust back 1/8 to get to 8 2/8.	
$10\frac{4}{6} + 4$ Write problem	**Teacher:** *What is 10 4/6 + 4?* **Goal:** 14 4/6; I start at 10 4/6 and jump 4 to get to 14 4/6.	
$10\frac{4}{6} + 3\frac{5}{6}$ Write problem	**Teacher:** *What is 10 4/6 + 3 5/6?* **Goal:** 14 3/6; I notice that 3 5/6 is close to 4. I start at 10 4/6 and jump 4 to get to 14 4/6. Then I adjust back 1/6 to get to 14 3/6.	
$14\frac{3}{10} + 6\frac{9}{10}$ Write problem	**Teacher:** *What is 14 3/10 + 6 9/10?* **Goal:** 21 2/10; I notice that 6 9/10 is close to 7. I start at 14 3/10 and jump 7 to get to 21 3/10 and adjust back 1/10 to get to 21 2/10.	

Strategies Taught

- Splitting
- Use a Friendly Number
- Get to a Friendly Number
- Give and Take
- Over and Adjust
- Find the Distance
- Keep the Same Distance
- Use Partial Products
- Double and Halve
- Facto and Group Flexibility
- Multiply Up
- Partial Quotients
- Use Relationships

Manipulatives included

- Equations
- Open Number Lines
- Open Arrays
- Ratio Tables
- Cuisenaire® Rods
- Two-Color Counters
- Fraction Circles

Fraction/ Decimal Operations

Math Talks

5/6 + 2/3

Add a Friendly Number

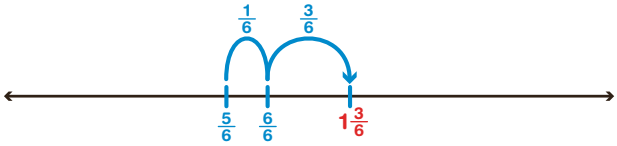
1 1/2; I think about a clock. I know 1/6 of an hour is 10/60, so 5/6 is 50/60. Then, 1/3 of an hour is 20/60, so 2/3 is 40/60. So, 50/60 + 40/60 = 90/60 = 1 30/60 = 1 1/2.

$$\frac{50}{60} + \frac{40}{60} = \frac{90}{60} = 1\frac{30}{60} = 1\frac{3}{6} = 1\frac{1}{2}$$

$$\frac{5}{6} + \frac{2}{3} = 1\frac{1}{2}$$

Get to a Friendly Number

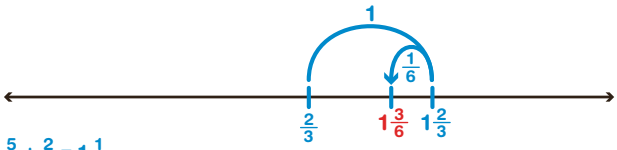
1 1/2; I think about 2/3 as 4/6. I start at 5/6 and jump 1/6 to get to 1 and 3/6 to get to 1 3/6 or 1 1/2.



$$\frac{5}{6} + \frac{2}{3} = (\frac{5}{6} + \frac{1}{6}) + \frac{3}{6} = 1 + \frac{3}{6} = 1\frac{3}{6} = 1\frac{1}{2}$$

Over and Adjust

1 1/2; I notice that 5/6 is close to 1. I start at 2/3 and jump 1 to get to 1 2/3, which is same as 1 4/6. Then I jump back 1/6 to get to 1 3/6 or 1 1/2.



$$\frac{5}{6} + \frac{2}{3} = 1\frac{1}{2}$$

Give and Take

1 1/2; I want to make an easier problem. I take 1/6 from 2/3 or 4/6 and give it 5/6. Then I solve the problem 1 + 3/6, which is 1 3/6 or 1 1/2.

Teacher Notes

Start the Math Talk by writing 5/6 + 2/3. Give students time to mentally solve the problem. Write all answers on the board and then have the students explain their thinking. Model student thinking using a manipulative that will help make the strategy clear for all students to access. Write any equations that represent the strategy.

Facilitating Questions: **1.** Can you find two strategies that are similiar? How are they the same? **2.** Are there any strategies that are more efficient than another? Why? **3.** After observing other strategies, did you revise your thinking? How?

Recommended by Teachers

"I believe Daily Math Fluency is an engaging routine that all math teachers should be implementing. I already did Number Talks, following the book by Sherry Parrish, which is very similar to Daily Math Fluency routines. **One of these programs should be followed everyday in a math classroom!** I enjoyed the materials that came with the Daily Math Fluency kit, especially the flexible grid arrays. My students love these routines and is a wonderful way for students to share their math thinking in a safe environment."

—3rd grade teacher, Alabama

"There are many reasons I love hand2mind's Daily Math Fluency Kits, but one of my top reasons is the combination of Concrete-Representation-Abstract. The kits have my favorite manipulatives, but the guides included in the kits help teachers build the connections. **It's the perfect mix to help students build their fluency."**

—Christina Tondevold, teacher educator & former middle school math teacher

"Daily Math Fluency from hand2mind **helps educators easily and effectively guide math talks with students.** This allowed our teachers the framework they were looking for to be intentional about math talks in their classrooms."

—Catherine Castillo, coordinator of 21st century numeracy, Springfield (MO) Public Schools

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