ETA hand2mind®

Grades K-5

Getting started with
DAILY MATH FLUENCY

Fluency Strategies
MATH TALKS
54 + 23

Grade 2

Counting On

7 + 0	Mark 7 on the number path	**Teacher:** I had 7 cubes. I didn't get any more. How many cubes do I have now? **Goal:** 7. I stayed on 7 and didn't add any, so it is 7 + 0, which is 7.
7 + 1	Mark 7 on the number path	**Teacher:** I had 7 cubes. My friend gave me one more cube. How many cubes do I have now? **Goal:** 8. I started at 7 and I counted 7, 8.
7 + 2	Mark 7 on the number path	**Teacher:** I had 7 cubes. My friend gave me 2 more cubes. How many cubes do I have now? **Goal:** 9. I started at 7 and counted on 7, 8, 9.
2 + 7	Show number path	**Teacher:** I had 7 cubes. My friend gave me 2 cubes. How many cubes do I have now? **Goal:** 9. Instead of starting at 2, I started at 7 and counted 7, 8, 9 = 7 + 2 = 7 + 2.
6 + 2	Show number path.	**Teacher:** I had 6 cubes. My friend gave me 2 cubes. How many cubes do I have now? **Goal:** 8. I started at the 6 counted 6, 7, 8.

Fluency Strategies
NUMBER STRINGS
54 + 23

Grade 2

Cards 1–60

A step-by-step guide for any grade level

Table of Contents

❝Problem strings build relationships and connections in learners, so that strategies become a natural outcome.❞
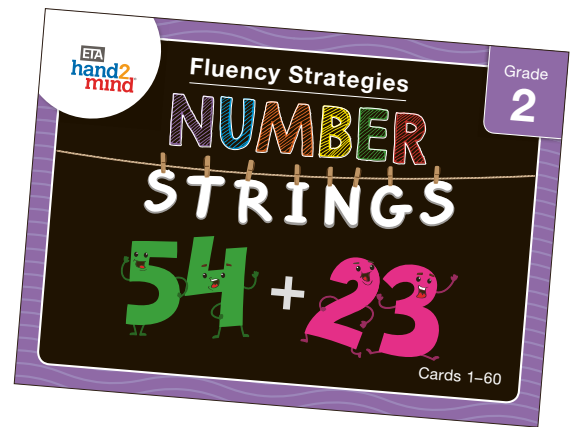
Pam Harris, **Author, Speaker**

❝Numeracy can't be taught. It **has to be caught**.❞
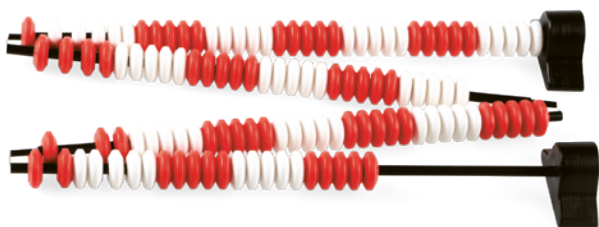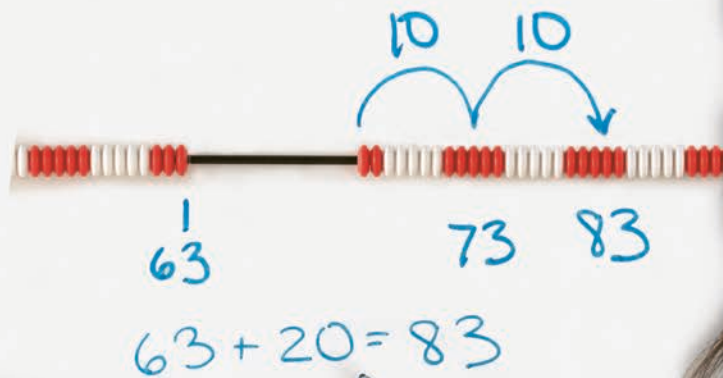
Christina Tondevold, **Author, Speaker**

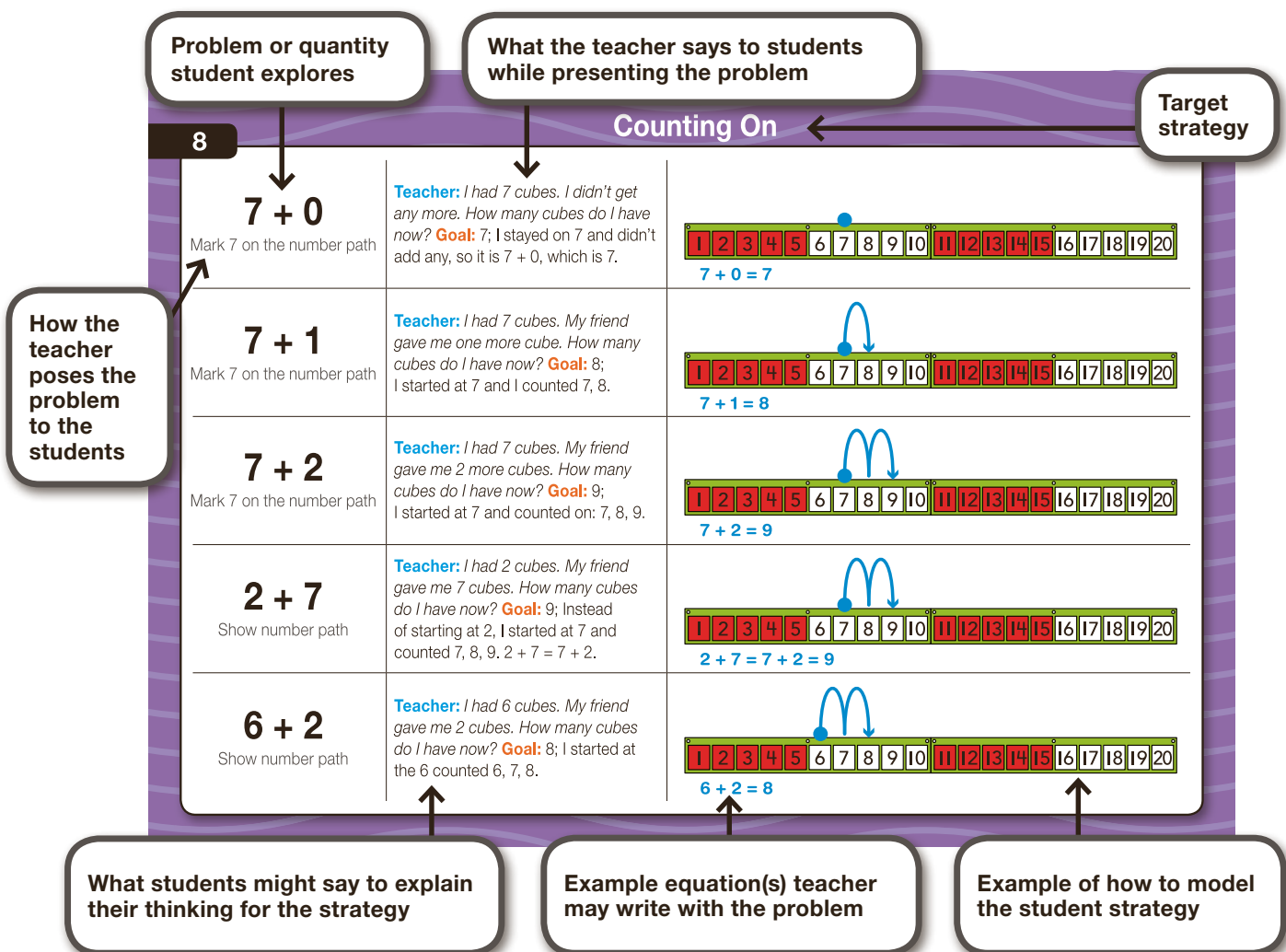*Daily Math Fluency Centers Kit, Grade 1*

What is Fluency?

Fluency is the ability to apply strategies accurately, efficiently, and flexibly and to recognize when one strategy is more appropriate to apply than another.

ETA hand2mind

Fluency Strategies

NUMBER STRINGS

54 + 23

Grade 2

Cards 1–60

What are Number Strings?

Number Strings are a series of related problems focused on a particular strategy, a big idea in mathematics, and/or a model. They have been purposely designed to help students construct mental strategies and to systematically nudge them toward efficiency. The teacher guides students through a Number String by choosing who shares, asking questions, drawing out relationships from the students' explanations, and modeling student thinking.

Problem or quantity student explores

What the teacher says to students while presenting the problem

Target strategy

How the teacher poses the problem to the students

8

Counting On

7 + 0 Mark 7 on the number path	**Teacher:** *I had 7 cubes. I didn't get any more. How many cubes do I have now?* **Goal:** 7; I stayed on 7 and didn't add any, so it is 7 + 0, which is 7.	7 + 0 = 7
7 + 1 Mark 7 on the number path	**Teacher:** *I had 7 cubes. My friend gave me one more cube. How many cubes do I have now?* **Goal:** 8; I started at 7 and I counted 7, 8.	7 + 1 = 8
7 + 2 Mark 7 on the number path	**Teacher:** *I had 7 cubes. My friend gave me 2 more cubes. How many cubes do I have now?* **Goal:** 9; I started at 7 and counted on: 7, 8, 9.	7 + 2 = 9
2 + 7 Show number path	**Teacher:** *I had 2 cubes. My friend gave me 7 cubes. How many cubes do I have now?* **Goal:** 9; Instead of starting at 2, I started at 7 and counted 7, 8, 9. 2 + 7 = 7 + 2.	2 + 7 = 7 + 2 = 9
6 + 2 Show number path	**Teacher:** *I had 6 cubes. My friend gave me 2 cubes. How many cubes do I have now?* **Goal:** 8; I started at the 6 counted 6, 7, 8.	6 + 2 = 8

What students might say to explain their thinking for the strategy

Example equation(s) teacher may write with the problem

Example of how to model the student strategy

How do you do a Number String?

1. Prepare an area to use the number string by gathering students in an area where the whole class meets. This can be the students sitting on a rug or in chairs situated where everyone can see each other and the board where you pose problems and represent their thinking.

2. Start the number string

✔ Pose one problem at a time using Picture Cards, Dot Cards, Ten Frame Cards, a Number Path, a Rekenrek, or writing a problem on the board (determined by the number string). Use the provided context for the problems, if suggested.

3. Establish classroom norms for strings

✔ Explain to students that they are expected to use what they know to solve the problem.

✔ Establish a discrete signal students should use to let you know that they have an answer to the problem.

✔ Wait until you notice that most students are ready to provide an answer to the problem, based on the signal that you have established with them.

4. Encourage student strategies

✔ Write down answers students provide. It is important to avoid giving any indication at this point that the answer is correct or incorrect.

✔ Strategically choose students to share by asking leading questions or circulating to find what target strategy they used. This can be students who have a good start, who have made a typical error that can be analyzed by the class, who have an idea that will help active learning happen, or who have used a target strategy. This is not about calling on a student who can explain the best, but about helping create a community of learners.

✔ Have students explain their strategy to the class.

5. Model student thinking

✔ While students explain their strategy, decide if you are going to model the strategy. You are looking for efficient ways to solve the problem and will model about 2–3 different strategies, with one being the strategy the number string is designed to elicit and develop.

✔ Model the strategy using the manipulative or tool the number string suggests.

✔ If a number string's purpose is a certain strategy to be developed and that strategy is not emerging from students, then you may need to question students to help them consider the strategy.

*Remember, this is not intended for everyone to use the same strategy by the end of a particular number string. It is always about encouraging students to look at the numbers and determine what strategy is most helpful for them.

What is a Math Talk?

Math Talks are based on one problem that is given to students to compare strategies. They are designed to generate discussions about efficient, clever, and elegant strategies for the given problem and numbers. The teacher allows multiple students to share different ways of solving the problem. Math Talks are less focused on a particular strategy and more focused on choosing a strategy from already constructed strategies.
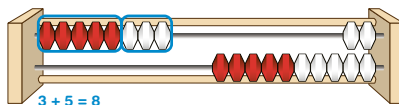
The problem, picture card, or dot card the teacher poses to the students to begin the math talk

5 + 3

Strategy name

Use the Five/Ten Structure

8; I think of a rekenrek with 5 red beads and 3 white beads.

3 + 5 = 8

Student dialogue of the named strategy

Use Doubles

8; I took 3 from the 5 and added it to the 3 to make 6 and 2 more is 8.

5 + 3 = 6 + 2 = 8

Example of a way to model a student strategy using a manipulative or tool

Use Known Facts

8; I took one from the 5 and gave it to the 3 to make 4 + 4 which is an easier problem for me because I know my doubles.

$$\begin{array}{r} 5 + 3 \\ -1 \ +1 \\ \hline 4 + 4 = 8 \end{array}$$

3 + 5 = 4 + 4 = 8

Example equation(s) teacher may write to represent the problem

Counting On

8; I started at 5 and counted 6, 7, 8.

Teacher Notes

Start the math talk by writing 5 + 3. Give students time to mentally solve problem. Write all answers on the board and then have the students explain their thinking. Teacher models student thinking using a manipulative that will help make the strategy clear for all students to access. Teacher writes an equation(s) that represents the strategy.

Facilitating Questions: 1. Can you find two strategies that are similiar? How are they the same? **2.** Is there a strategy(s) that is more efficient than an another? Why? **3.** After observing other strategies, did you revise your thinking? How?

Math Talks

4

Fluency Strategies

Grade 2

MATH TALKS

54 + 23

How do you do a Math Talk?

1. Prepare an area to conduct the Math Talk
✔ Gather students in an area where the whole class meets. This can be the students sitting on a rug or in chairs situated where everyone can see each other and the board you use to pose the problem and represent their thinking.

2. Start the Math Talk
✔ Pose the problem provided on the Math Talk to the class. You may pose a problem by displaying a Picture Card, Dot Card, or writing the problem on the board (determined by the Math Talk).

3. Establish classroom norms for Math Talks
✔ Explain to students that they are expected to use what they know to solve the problem.

✔ Establish a discrete signal students use to let you know that they have an answer to the problem.

✔ Wait until you notice that most students are ready to provide an answer to the problem, based on the signal that you have established with them.

4. Encourage student strategies
✔ Write down answers students provide. It is important to not lead on whether the student is correct or incorrect.

✔ Strategically choose students to share by asking questions or circulating and finding different strategies. Have students share in an order that the strategies build upon each other or from least efficient to most efficient.

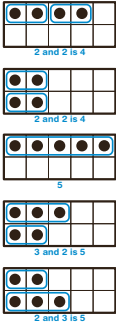✔ Have students explain their strategy to the class.
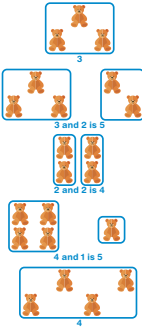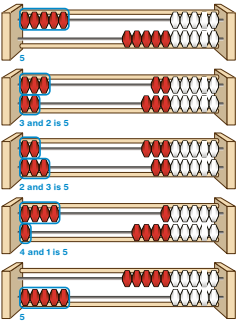
5. Model student thinking
✔ While students explain their strategy, model it using the manipulative or tool the student says they used to come up with the answer. This could include a Number Path, a Rekenrek, or ten frames.

6. Math discussion
✔ Provide opportunities for students to turn and talk about the strategies that have been modeled.

✔ Allow students opportunities to clarify understanding of someone else's strategy.

✔ Help students see their strategy in others and build towards efficiency.
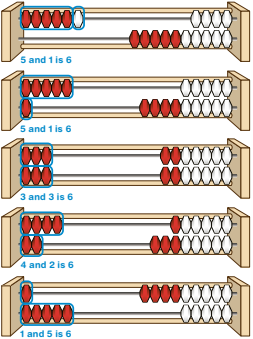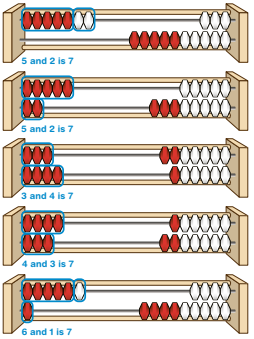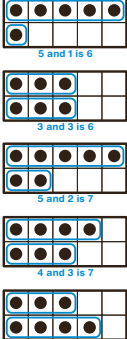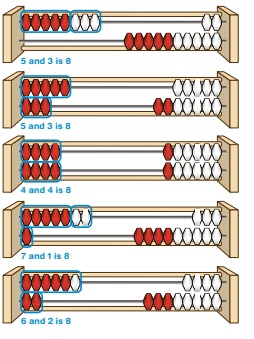
*Math Talks are designed to elicit multiple strategies, provide opportunities for students to reason about the relationships in the numbers, and make connections In mathematics.

Lesson Plan Example • Week 1

Monday	Tuesday	Wednesday	Thursday	Friday
Math Talk # 2 Show Card D-F	Number String: Card 7	Number String: Card 6	Number String: Card 8	Math Talk # 8 Show Rekenrek with 3 on top and 2 on bottom

Notes: Math Talk is used to see what strategies students use to solve the problem before any Number String working with 4 and 5 have been presented. Based on the Math Talk most students were counting all.. Number Strings 7, 6, and 8 are used to to help students begin to instantly recognize the numbers 4 and 5 by using a structured arrangement. Math Talk # 8 is used to see if students are beginning to instantly recognize the number 5 using more sophisticated strategies than what the student did on the first day.

Lesson Plan Example • Week 2

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 9	Number String: Card 10	Number String: Card 11	Math Talk # 13 Show Rekenrek with 4 on top and 2 on bottom	Number String: Card 12

Notes: Number Strings 9, 10, and 11 are used to to begin work on instantly recognizing 6 and 7 using structured arrangements. Math Talk 13 is used to help students begin to hear different strategies on how they see the number 6. Number String 12 begins to work on instantly recognizing the number 8.

Lesson Plan Example • Week 3

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 13	Number String: Card 14	Math Talk # 21 Show Rekenrek with 5 on top and 3 on bottom	Number String: Card 28	Number String: Card 29

Notes: Number Strings 13 and 14 are used to continue working on instantly recognizing 8 and 9 using structured arrangements. Math Talk 21 is used to help students hear different strategies on how they see the number 8. Number Strings 28 and 29 begin to connect the different ways to recognize numbers to addition.

Lesson Plan Example • Week 4

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 30	Number String: Card 33	Number String: Card 34	Math Talk # 25 Show Rekenrek with 7 on top and 2 on bottom	Number String: Card 35

Notes: Number Strings 30, 33, and 34 are continuing to connect the recognition of numbers to addition using joining language. Math Talk 25 to hear different ways to see the number 9 and using joining language as the students are explaining how they see the number. Number String 35 is beginning to work on connecting the addition symbols to the joining language.

Lesson Plan Example • Week 1

Monday	Tuesday	Wednesday	Thursday	Friday
Math Talk # 6 7 + 4	Number String: Card 61 5 + 5 4 + 6 3 + 7 2 + 8 1 + 9	Number String: Card 62 5 + __ = 10 7 + __ = 10 3 + __ = 10 8 + __ = 10 2 + __ = 10	Number String: Card 63 4 + __ = 10 6 + __ = 10 1 + __ = 10 9 + __ = 10 5 + __ = 10	Math Talk # 7 6 + 5

Notes: Math Talk #6 is used to see what strategies students use to solve the problem before any Number Strings working on making ten are presented. Based on the Math Talk most students were counting on or using five and 10. Number Strings 61, 62, and 63 are used to to help students begin to work on making 10 and seeing different combinations of ten. Math Talk #8 is used to see if students are beginning to see a way to get to ten in the fact.

Lesson Plan Example • Week 2

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 66 9 + 1 9 + 2 9 + 6 8 + 2 8 + 6	Number String: Card 67 8 + 2 8 + 3 8 + 8 9 + 1 9 + 9	Number String: Card 68 6 + 4 6 + 7 7 + 3 3 + 7 7 + 7	Number String: Card 69 8 + 2 8 + 5 7 + 4 7 + 3 7 + 8	Math Talk # 8 4 + 9

Notes: Number Strings 66, 67, 68, and 69 are beginning to work with students constructing Get to Ten strategy. Math Talk #8 is used so students can hear all of the different strategies used to solve the problem with a focus on using the Get to Ten strategy.

Lesson Plan Example • Week 3

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 70	Number String: Card 71	Number String: Card 72	Number String: Card 73	Math Talk # 14
6 + 4	5 + 5	10 + 2	10 + 7	5 + 9
6 + 9	6 + 5	9 + 3	9 + 8	
7 + 8	8 + 2	10 + 4	6 + 10	
7 + 3	8 + 3	9 + 5	7 + 9	
6 + 7	8 + 4	9 + 8	6 + 8	

Notes: Number Strings 70, 71, 72, and 73 are used to continue helping students construct Get to Ten strategy. Math Talk # 14 is used so students can hear all of the different strategies used to solve the problem with a focus on using the Get to Ten strategy.

Lesson Plan Example • Week 4

Monday	Tuesday	Wednesday	Thursday	Friday
Math Talk # 45	Number String: Card 79	Number String: Card 80	Number String: Card 81	Math Talk # 48
12 – 3	15 – 5	12 – 2	14 – 4	12 – 8
	15 – 6	12 – 4	14 – 9	
	11 – 4	13 – 8	15 – 5	
	11 – 1	13 – 3	15 – 7	
	13 – 5	11 – 5	12 – 7	

Notes: Math Talk # 45 is used to see what strategies students use to solve the problem. Based on how the students solved the problem they were mainly counting back. Number Strings 79, 80 , and 81 are used to construct using Get to Ten strategy with subtraction. Math Talk #48 is used so students can hear different strategies used to solve the problem.

Lesson Plan Example • Week 1

Monday	Tuesday	Wednesday	Thursday	Friday
Math Talk: 12 + 34	Number String: 31 Splitting- Two-Digit	Number String: 32 Splitting- Two-Digit	Number String: 33 Splitting- Two-Digit	Math Talk: 26 + 22
	10 + 10	10 + 20	10 + 30	
	2 + 4	4 + 4	6 + 3	
	12 + 14	14 + 24	16 + 33	
	5 + 4	3 + 6	7 + 1	
	15 + 14	13 + 26	17 + 31	

Notes: Math Talk is used to see what strategies students use to solve the problem before any two-digit Number Strings have been presented. Based on the Math Talk most students were drawing pictures and counting on. Number Strings 31, 32, and 33 are used to provide students with a more efficient strategy based on place value understanding. Math Talk is used to see if students are beginning to use different strategies than what they did on the first day.

Lesson Plan Example • Week 2

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: 41 Add a Friendly Number	Number String: 42 Add a Friendly Number	Number String: 43 Add a Friendly Number	Number String: 44 Add a Friendly Number	Math Talk: 36 + 42
15 + 10	24 + 10	54 + 20	58 + 30	
15 + 14	24 + 16	54 + 27	58 + 35	
16 + 10	38 + 20	67 +30	75 + 20	
16 + 12	38 + 22	67 + 36	75 + 28	
16 + 22	27 + 23	58 + 44	64 + 37	

Notes: Number Strings 41, 42, 43, and 44 are used to introduce a new strategy using the 120 Bead Rekenrek as a model of student thinking to begin bridging the students to an open number line. Math Talk is used to help students begin to hear different strategies and have discussions about what strategies are efficient.

Lesson Plan Example • Week 3

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: 51	Number String: 52	Number String: 53	Math Talk: 75 + 14	Number String: 46
Get to a Friendly Number	Get to a Friendly Number	Get to a Friendly Number		Add a Friendly Number
29 + 1	36 + 4	56 + 4		46 + 30
29 + 11	36 + 24	56 + 34		46 + 38
38 + 2	28 + 2	7 + 68		43 + 48
38 + 12	28 + 23	37 + 68		67 + 50
37 + 23	37 + 15	26 + 77		67 + 57

Notes: Number Strings 51, 52, 53 are used to introduce a new strategy using the 120 Bead Rekenrek as a model of student thinking to continue bridging the students to an open number line. Math Talk is used to help students begin to hear different strategies and have discussions about what strategies are efficient. Number String 46 is used to begin modeling student thinking on an open number line and continue working on the strategy Add a Friendly Number.

Lesson Plan Example • Week 4

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: 56	Number String: 47	Number String: 57	Math Talk: 53 + 46	Number String: 61
Get to a Friendly Number	Get to a Friendly Number	Get to a Friendly Number		Remove a Friendly Number
48 + 2	36 + 30	57 + 3		32 – 10
22 + 48	36 + 38	57 + 35		32 – 20
34 + 48	53 + 20	66 + 4		32 – 22
37 + 3	53 + 29	66 + 74		46 – 30
37 + 53	78 + 39	85 + 57		46 – 39

Notes: Number Strings 56, 47, and 57 are used to continue modeling student thinking on an open number line and help students begin to solidify the strategies Add a Friendly Number and Get to a Friendly Number with a Two-Digit Number. Math Talk is used as time for students to look at the numbers and determine what they think is the best strategy for those numbers. The teacher facilitates this discussion with a focus towards efficiency. Number String 61 is used as the beginning of looking at how these strategies work with subtraction.

Lesson Plan Example • Week 1

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 77	Number String: Card 78	Number String: Card 79	Math Talk # 31 4 x 3	Number String: Card 81
2 x 2	2 x 3	2 x 4		2 x 7
2 x 4	4 x 3	4 x 4		4 x 7
2 x 3	3 x 4	8 x 4		8 x 7
2 x 6	8 x 3	2 x 6		3 x 7
2 x 5	6 x 4	8 x 6		6 x 7

Notes: Number Strings 77, 78, and 79 are used to begin working on constructing Using Doubles strategy. Math Talk #31 is presented to students after they have had a few days to construct some strategies to solve the problem. The discussion will focus on the use of the Double strategy. Number String 81 is used to continue working on doubling.

Lesson Plan Example • Week 2

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 83	Number String: Card 84	Math Talk # 33 3 x 8	Number String: Card 90	Number String: Card 92
2 x 4	2 x 7		10 x 4	10 x 3
3 x 4	3 x 7		9 x 4	11 x 3
2 x 6	2 x 9		10 x 6	9 x 3
3 x 6	3 x 9		9 x 6	10 x 4
3 x 8	3 x 5		9 x 8	9 x 4

Notes: Number Strings 83 and 84 are used to work on the use of partial products. These two strings help students build upon the idea of doubling, by using what they know about the Double Strategy and then adding another group. Math Talk #33 is given to students so they can hear other students strategies and discussions can be about different efficient strategies to solve 3 x 8.. Number Strings 90 and 92 begin working with students on constructing the Ten Times strategy to help them know the nine's and 11's.

Lesson Plan Example • Week 3

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 93	Math Talk # 37	Number String: Card 91	Number String: Card 94	Math Talk # 34
10 x 7	7 x 9	10 x 6	10 x 8	9 x 5
11 x 7		5 x 6	5 x 8	
9 x 7		10 x 7	10 x 4	
10 x 9		5 x 7	5 x 4	
9 x 9		5 x 8	5 x 6	

Notes: Number String 93 is used to continue work on constructing the Ten Times strategy. Math Talk #37 is given to provide students an opportunity to hear different ways to solve 7 x 9. The teacher will focus on efficient, elegant and clever strategies. Number Strings 91 and 94 are used to continuing constructing using the Ten Times strategy, but this time for solving the five facts. Math Talk # 34 is used to provide the teacher with information about what strategies the students have constructed or are beginning to construct.

Lesson Plan Example • Week 4

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 96	Number String: Card 97	Number String: Card 99	Math Talk # 36	Number String: Card 88
10 x 4	5 x 5	5 x 8	6 x 7	2 x 9
5 x 4	2 x 5	1 x 8		4 x 9
6 x 4	7 x 5	6 x 8		6 x 9
7 x 4	5 x 4	5 x 9		4 x 5
6 x 8	7 x 4	6 x 9		6 x 5

Notes: Number Strings 96, 97, and 99 are used to construct the Using Five Times strategy to help remember their six and seven facts. Math Talk #36 is used for the students and teacher to hear all of the different strategies they can use to solve the problem The teacher will focus on the efficient strategies. Number String 88 is used to continue working the idea that students can use the strategy of Partial Products by using facts they know to help them with unknown facts.

Lesson Plan Example • Week 1

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 61	Number String: Card 62	Number String: Card 63	Math Talk # 31

12 x 4 | Number String: Card 64 |
3 x 10	4 x 10	70 x 6		70 x 6
3 x 4	4 x 6	6 x 6		6 x 6
3 x 14	4 x 16	76 x 6		76 x 6
3 x 20	4 x 20	7 x9		7 x9
3 x 24	4 x 26	47 x 9		47 x 9

Notes: Number Strings 61, 62, and 63 are used to begin working on constructing Using Partial with two digit by one digit multiplication. Math Talk #31 is presented to students after they have had a few days to construct some strategies to solve the problem. The discussion will focus on the use of Using Partial Products as an efficient way to solve the problem. Number String 64 is used to continue working on Using Partial Products.

Lesson Plan Example • Week 2

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card A	Number String: Card B	Number String: Card C	Math Talk # 31

6 x 32 | Number String: Card D |
31 x 10	22 x 30	40 x 46		12 x 10
31 x 4	22 x 3	4 x 46		12 x 5
31 x 14	22 x 33	44 x 46		12 x 15
20 x 17	56 x 20	60 x 38		10 x 15
22 x 17	56 x 24	63 x 38		15 x 15

Notes: Number Strings A, B and C are used to continue working on the strategy Using Partial Products with two-digit by two-digit. These strings help build upon the idea that was used with two-digit by one-digit to also work with two-digit by two-digit.Math Talk #33 is given to students so they can hear other students strategies and discussions can be about different efficient strategies to solve 6 x 32.. Number Strings D continues work on Using Partial Products.

Lesson Plan Example • Week 3

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card E	Number String: Card F	Math Talk # 44 19 x 12	Number String: Card G	Number String: Card H
7 x 6	20 x 20		2 x 365	2 x 144
70 x 6	20 x 18		3 x 365	3 x 144
69 x 6	30 x 30		5 x 365	5 x 144
30 x 8	28 x 30		6 x 365	10 x 144
29 x 8	38 x 40		9 x 365	9 x 144

Notes: Number String E and F are used to continue work on constructing the Using Partial Product Strategy.. Math Talk #44 is given to provide students an opportunity to hear different ways to solve 19 x 12.. The teacher will focus on efficient, elegant and clever strategies. Number Strings G and H are used to begin constructing Using Partial Products with three-digit by one-digit.

Lesson Plan Example • Week 4

Monday	Tuesday	Wednesday	Thursday	Friday
Math Talk # 36 425 x 4	Number String: Card I	Number String: Card J	Number String: Card K	Math Talk # 38 4 x 3,995
	7 x 40	3 x 25	4 x 300	
	7 x 39	3 x 300	4 x 32	
	7 x 400	3 x 325	4 x 332	
	7 x 399	3 x 4,000	5 x 2,000	
	6 x 299	3 x 4,325	5 x 2,332	

Notes: Math Talk #36 is used for the students and teacher to hear all of the different strategies they can use to solve the problem. The teacher will focus on the efficient strategies. Number String used I, J, and K are used to continue and begin working on the idea that students can use the strategy of Partial Products with 3-digit by 1-digit and 4-digit by 1 digit. Math Talk # 38 is for teachers to present to students to see what strategies they will use and for the students to hear all of the different ways to solve the problem.

Lesson Plan Example • Week 1

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 3	Number String: Card 4	Number String: Card 5	Math Talk # 11	Number String: Card 6
368 + 100	2.7 + 3	10 + 20	8.9 + 30	$\frac{1}{2} + \frac{1}{4}$
368 + 140	2.7 + 3.4	4 + 4		$\frac{3}{4} + \frac{1}{2}$
4.6 + 2	7.38 + 0.2	14 + 24		$\frac{1}{10} + \frac{1}{20}$
4.6 + 2.7	7.38 + 0.26	3 + 6		$\frac{3}{20} + \frac{1}{2}$
3.8 + 4.5	7.38 + 0.43	13 + 26		$\frac{3}{4} + \frac{3}{20}$

Notes: Number Strings 3, 4, and 5 are used to review the strategy Adding a Friendly Number with decimals.. Math Talk #11 is presented to students after they have had a few days to work with decimals. The students will be able to hear different strategies used to the solve the same problem. The teacher will focus on efficient strategies. Number String 6 is to begin working with students using the money model to add fractions with unlike denominators.

Lesson Plan Example • Week 2

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 7	Math Talk # 22	Number String: Card 8	Number String: Card 9	Math Talk # 23
$\frac{1}{2} + \frac{1}{5}$	$\square + \frac{1}{2}$	$\frac{1}{2} + \frac{1}{3}$	$\frac{2}{3} + \frac{1}{2}$	$\square + \frac{2}{3}$
$1\frac{1}{2} + 2$		$\frac{1}{4} + \frac{1}{2}$	$1\frac{2}{3} + 2$	
$1\frac{1}{2} + 2\frac{1}{5}$		$\frac{3}{4} + \frac{1}{6}$	$1\frac{2}{3} + 2\frac{1}{2}$	
$3\frac{3}{4} + 1\frac{1}{2}$		$\frac{2}{3} + \frac{4}{6}$	$\frac{1}{12} + \frac{1}{6}$	
$4\frac{1}{4} + 5\frac{1}{10}$		$\frac{3}{4} + \frac{2}{3}$	$2\frac{3}{12} + 2\frac{2}{6}$	

Notes: Number String 7 is used to continue working on adding fractions with unlike denominators using the money model. .Math Talk #22 is given to students so they can hear other students strategies and discussions can be about different efficient strategies to solve   + ½. The teacher will model students thinking and can focus on why the money model might be a good model for these numbers. Number Strings 8 and 9 are used to work with students on using the clock model when adding fractions with unlike denominators. Math Talk #23 is presented for students to solve and discuss efficient strategies and models that work well with these numbers.

Lesson Plan Example • Week 3

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 10	Number String: Card 11	Number String: Card 13	Math Talk # 25	Number String: Card 33
$\frac{1}{4} + \frac{1}{4}$	$\frac{2}{10} + \frac{2}{10}$	$\frac{1}{5} + \frac{1}{7}$	$38 \square + 27\frac{9}{10}$	$\frac{3}{4} - \frac{1}{2}$
$\frac{1}{4} + \frac{1}{2}$	$\frac{2}{5} + \frac{3}{10}$	$\frac{2}{5} + \frac{1}{7}$		$\frac{1}{2} - \frac{1}{10}$
$\frac{1}{8} + \frac{1}{8}$	$\frac{1}{6} + \frac{1}{6}$	$\frac{2}{5} + \frac{3}{7}$		$\frac{7}{20} - \frac{1}{5}$
$\frac{2}{8} + \frac{1}{4}$	$\frac{2}{3} + \frac{4}{6}$	$\frac{1}{3} + \frac{1}{8}$		$\frac{9}{10} - \frac{1}{4}$
$\frac{3}{4} + \frac{1}{8}$	$1\frac{1}{2} + 1\frac{1}{3}$	$\frac{2}{3} + \frac{3}{8}$		$\frac{4}{5} - \frac{3}{4}$

Notes: Number Strings 10, 11, and 13 are used to work with a new model to add fractions with unlike denominators. Math Talk #25 is used for students to hear different strategies and models used to solve the problem. The teacher will focus on efficient strategies. Number String 33 is used to begin work with the same models used for addition but this time for subtraction.

Lesson Plan Example • Week 4

Monday	Tuesday	Wednesday	Thursday	Friday
Number String: Card 34	Math Talk # 27	Number String: Card 35	Number String: Card 36	Math Talk # 28
$3\frac{1}{2} - 1$	$14\frac{3}{4} - 5\frac{1}{2}$	$\frac{3}{4} - \frac{1}{2}$	$2\frac{3}{4} - 1$	$22\frac{3}{4} + 9\frac{4}{6}$
$3\frac{1}{2} - 1\frac{1}{4}$		$\frac{1}{2} - \frac{1}{3}$	$2\frac{3}{4} - 1\frac{1}{3}$	
$10\frac{3}{20} - 9$		$\frac{2}{3} - \frac{1}{6}$	$4\frac{1}{2} - 2$	
$10\frac{3}{20} - 9\frac{3}{10}$		$\frac{5}{6} - \frac{1}{12}$	$4\frac{1}{2} - 2\frac{1}{12}$	
$101\frac{4}{5} - 99\frac{3}{4}$		$\frac{7}{12} - \frac{1}{4}$	$4\frac{3}{4} - 3\frac{2}{3}$	

Notes: Number String 34 is used to continue working on the money model with subtraction. Math Talk #27 is used for students to discuss the different ways they solved the problems with a discussion about the models. Number Strings 35 and 36 is used to work using the clock model with subtraction of fractions with unlike denominators. Math Talk #28 is used for students to solve in a way that makes sense to them. The discussion will focus on efficient strategies and models that work well with the numbers.
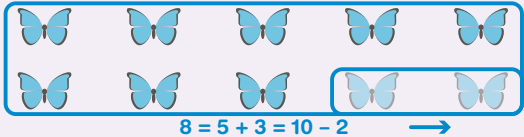
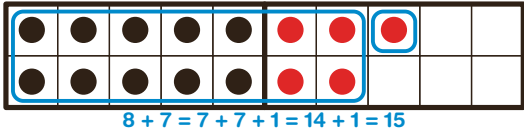# Strategies & Models by Grade Level
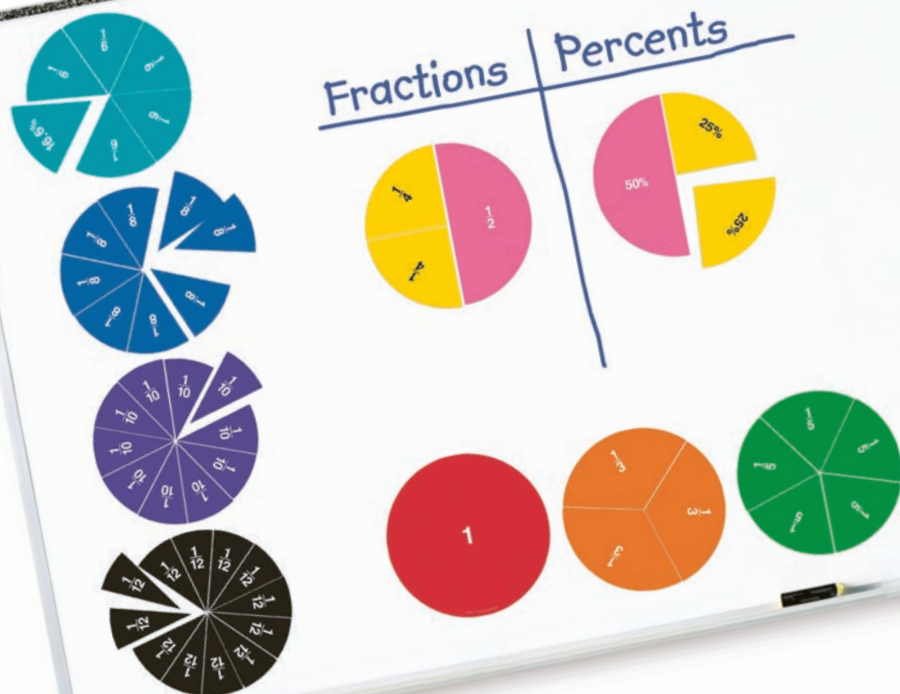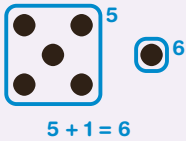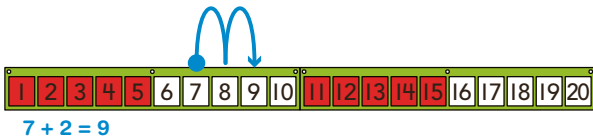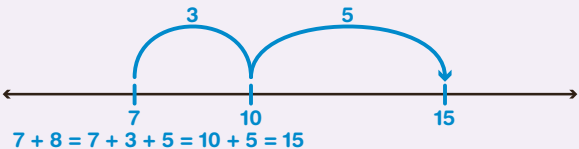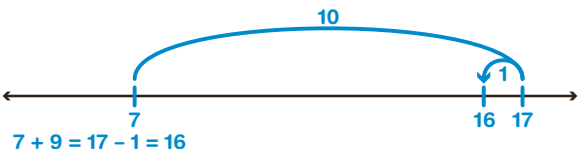
Hands-On Models						
Models	**Grade K**	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**	**Grade 5**
Demonstration Rekenrek	✓	✓	✓			
Number Path Pocket Chart	✓	✓				
Picture/Dot Cards	✓	✓		✓	✓	
Five/Ten/Double Ten-Frame Cards	✓	✓	✓			
Demonstration Open Number Line Poster		✓	✓	✓	✓	✓
Magnetic Demonstration 120-Bead Rekenrek Line			✓	✓		
Ratio Table Poster				✓	✓	✓
Flexitable Grid Array				✓	✓	
Two-Color Magnetic Counters						✓
Magnetic Demonstration Cuisenaire® Rods						✓
Magnetic Demonstration Fraction Circles						✓
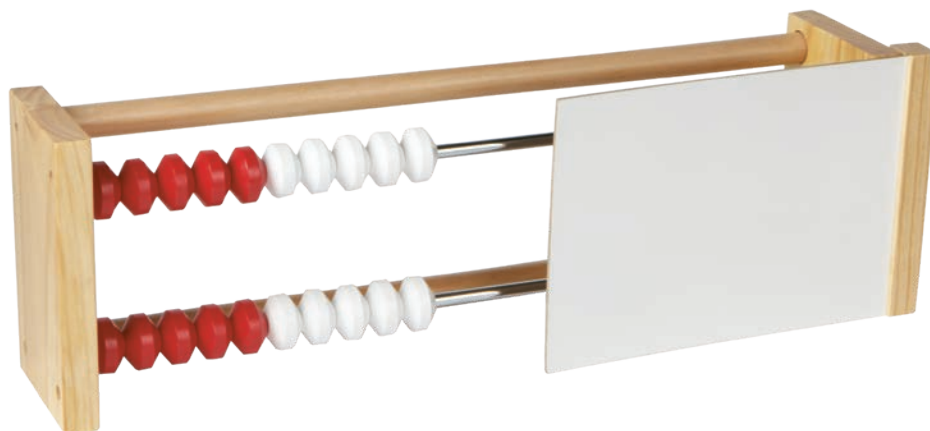
Grades K–2 Strategies

Grades K–2				
Strategies		**Grade K**	**Grade 1**	**Grade 2**
Subitizing	$5 + 1 = 6$	✓	✓	✓
Counting On and Counting Back	$7 + 2 = 9$	✓	✓	✓
Use Five/Use Ten	$8 = 5 + 3 = 10 - 2$	✓	✓	✓
Use Doubles	$8 + 7 = 7 + 7 + 1 = 14 + 1 = 15$	✓	✓	✓
Get to Ten	$7 + 8 = 7 + 3 + 5 = 10 + 5 = 15$	✓	✓	✓
Use Ten and Adjust	$7 + 9 = 17 - 1 = 16$		✓	✓
Use Known Facts	$6 + 8 =$ $\underline{+1 \quad -1}$ $7 + 7 = \mathbf{\color{red}{14}}$		✓	✓
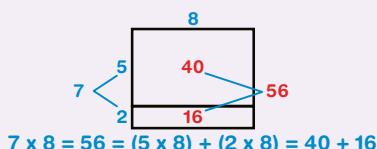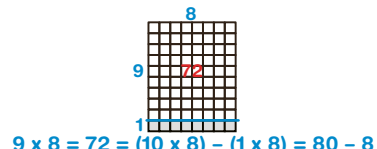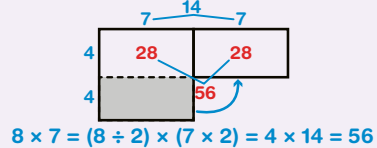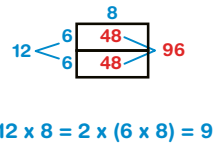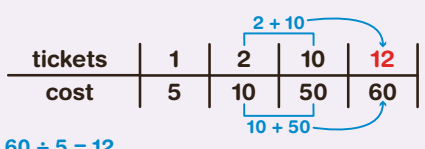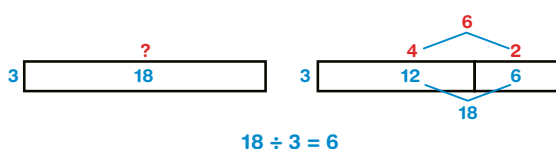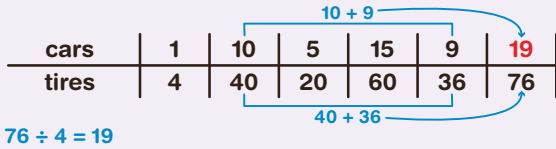
Grades K–2 Strategies (continued)

Grades K–2				
Strategies		**Grade K**	**Grade 1**	**Grade 2**
Splitting	43 + 15 40 + 3 + 10 + 5 50 + 8 43 + 15 = 58 50 + 8 = 58			✔
Use a Friendly Number	100 30 2 226 326 356 358 226 + 132 = 358			✔
Get to a Friendly Number	5 100 43 195 200 300 343 343 – 148 = 195			✔
Give and Take	386 + 218 + 14 – 14 400 + 204 = 604			✔
Over and Adjust	600 2 267 269 867 867 – 598 = 269			✔
Find the Distance	3 2 697 700 702 702 – 697 = 5			✔
Keep the Same Distance	146 178 22 200 324 22 346 324 – 178 = 146			✔

Grades 3–5 Strategies

Grades 3–5				
Strategies		**Grade 3**	**Grade 4**	**Grade 5**
Splitting	43 + 15 40 + 3 + 10 + 5 50 + 8 43 + 15 = 58 50 + 8 = **58**	✔	✔	✔
Use a Friendly Number	100 30 2 226 326 356 **358** 226 + 132 = 358	✔	✔	✔
Get to a Friendly Number	5 100 43 **195** 200 300 343 343 – 148 = 195	✔	✔	✔
Give and Take	386 + 218 + 14 – 14 400 + 204 = **604**	✔	✔	✔
Over and Adjust	600 2 267 **269** 867 867 – 598 = 269	✔	✔	✔
Find the Distance	3 2 697 700 702 702 – 697 = 5	✔	✔	✔
Keep the Same Distance	146 178 22 200 324 22 346 324 – 178 = 146	✔	✔	✔
Double	1 + 2 bags | 1 | 2 | 4 | 8 | 3 pens | 8 | 16 | 32 | 64 | **24** 8 + 16 3 x 8 = 24	✔	✔	✔
Use Partial Products	7 10 **70** **98** 4 **28** 14 × 7 = 98 = (10 × 7) + (4 × 7) = 70 + 28	✔	✔	✔

Grades 3–5 Strategies (continued)

Grades 3–5		Grade 3	Grade 4	Grade 5
Strategies				
Use Five Times	$7 \times 8 = 56 = (5 \times 8) + (2 \times 8) = 40 + 16$	✔	✔	✔
Use Ten Times	$9 \times 8 = 72 = (10 \times 8) - (1 \times 8) = 80 - 8$	✔	✔	✔
Double and Halve	$8 \times 7 = (8 \div 2) \times (7 \times 2) = 4 \times 14 = 56$	✔	✔	✔
Factor and Group Flexibility	$12 \times 8 = 2 \times (6 \times 8) = 96$	✔	✔	✔
Multiply Up	$60 \div 5 = 12$	✔	✔	✔
Partial Quotients	$18 \div 3 = 6$	✔	✔	✔
Use Relationships	$76 \div 4 = 19$	✔	✔	✔

Tips & Tricks

How many Number Strings should you do before doing a Math Talk?

You do not have to do a set amount of Number Strings before you do a Math Talk; however, students need to have at least a couple of different strategies to use before you do a Math Talk. If you have only done one type of Number String with students, then that may be the only strategy they use during a Math Talk. You can also do a Math Talk first as a way to assess what strategies your students already know. This would help you determine what Number Strings you might want to do with students. If all students are splitting, then you are probably not going to choose a Splitting Number String. You might do a Use a Friendly Number or Get to a Friendly Number.

When you are doing a Number String how do you handle a wrong answer?

When a student gives a wrong answer, go ahead and write the answer on the board. Once you have a few answers, have the first student who gave you an answer explain his/her thinking. If that's the student who answered incorrectly, s/he may correct the answer as s/he explains it. If it's not the student with the incorrect answer, check back with that student before you move to the next problem to make sure s/he agrees with the correct answer.
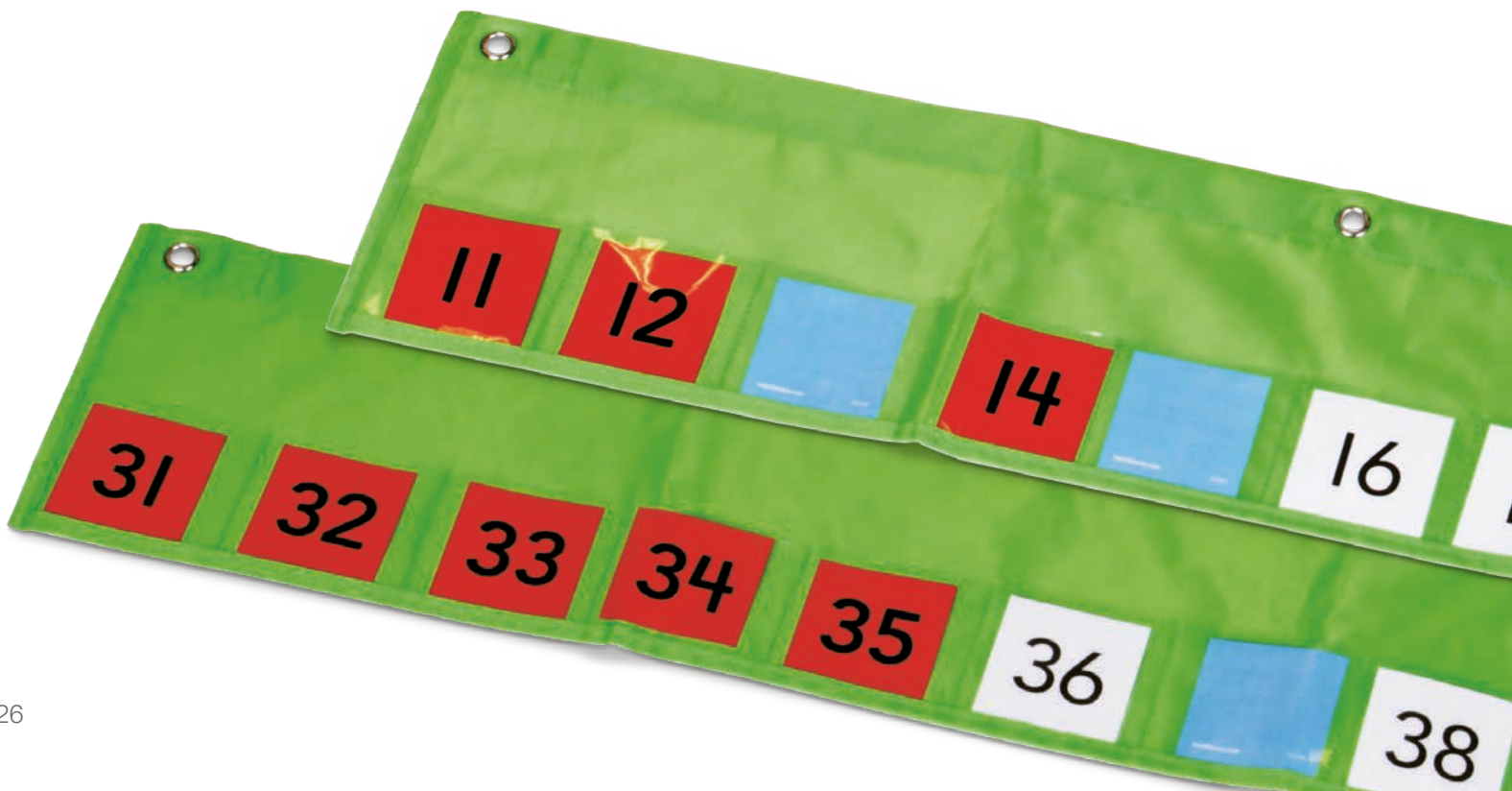
Tips & Tricks

(continued)

## Is there an order you should do the Number Strings?

There are definitely some strategies that are less sophisticated than others and some strategies that really help build to others. For multidigit addition, you can start with Splitting, move to Use a Friendly Number, then to Get a Friendly Number, and finally to Give and Take for Addition. For subtraction, start with Use a Friendly Number, move to Get a Friendly Number, then to Find the Distance, and finally to Keep the Same Distance. However, you can adapt these suggestions to fit your curriculum and what works best for your students.

What do students hold or use when you are doing Number Strings and Math Talks?

In most cases students are doing the math in their heads. They should not have anything in their hands, unless the problems are more complicated and you want them to keep up with their mental steps. The manipulatives used in the strings should only be demonstration ones. The students should not have these in their hands during a string. The only thing they might use is paper and pencil.

Is Daily Math Fluency aligned to state standards?

Daily Math Fluency is aligned to the fluency standards. This means that not all state standards are covered. For example, there are no geometry standards. However, you may get a few extra standards from another state in certain grades. Other concepts may seem to be missing from a grade level. Fractions are only in 5th grade, because fluency standards for fractions are only in grade 5.

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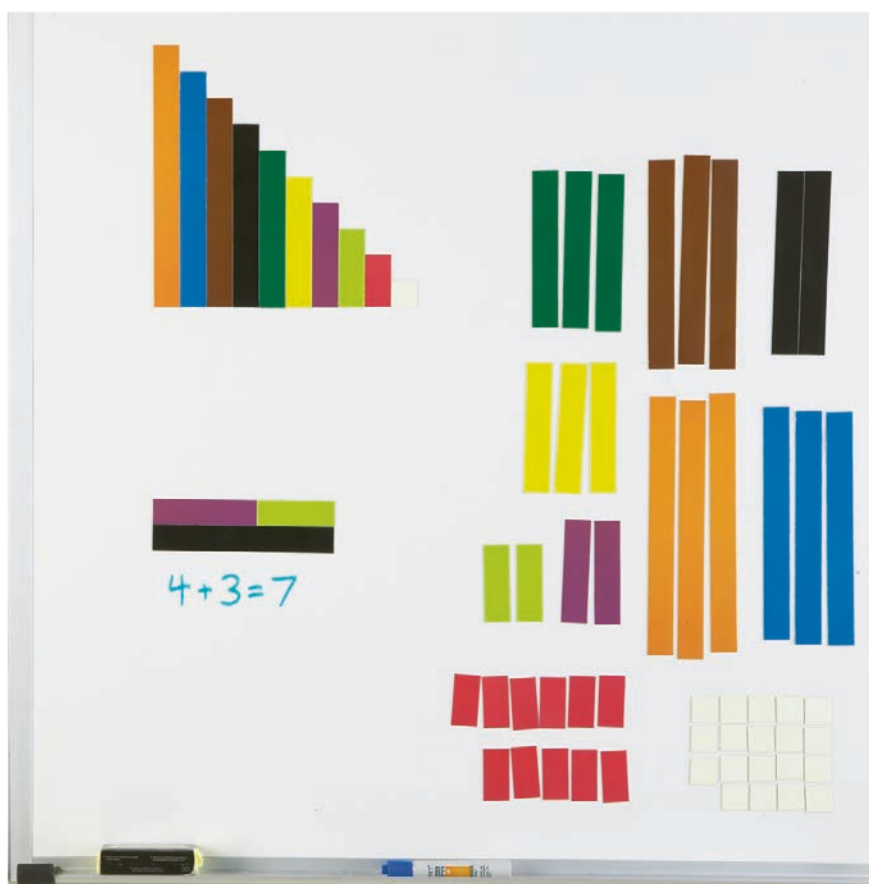
Daily Math Fluency

Targeted problems designed to teach strategies
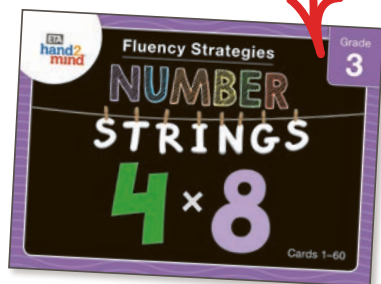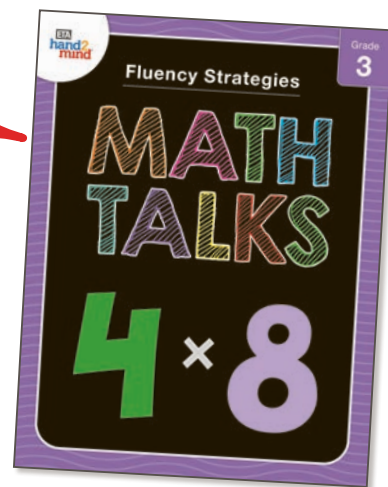

Daily Math Fluency Number Strings, Grade 3

Daily Math Fluency, Grade 3

Elicit multiple strategies

Daily Math Fluency Math Talks, Grade 3

Available Configurations

Daily Math Fluency Kit, Grade 1

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Teach your students how to master math strategies using Number Strings and Math Talks. Includes Teacher Guide, Math Talks Book with 60 talks, 120 Number String Cards, Anchor Charts, and Demonstration Manipulatives.

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