From Models to Meaning:
Using Models to Make Sense of Addition and Subtraction Math Facts

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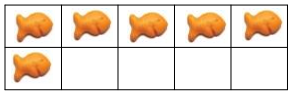
How can we be sure our students acquire more than memorized facts?
How might models play a role?

Exploring +1

Read *Fish Eyes* by Lois Ehlert

5 + 1 = 6

Show 5.



Record and discuss results.

5 + 1 = 6
3 + 1 = 4
7 + 1 = 8
2 + 1 = 3

What do you notice?
What is 4 + 1? How do you know?
Try it. Were you right?
Could you add 1 without using the counters? How?
What happens when you add 1 to a number?

MATH PRACTICE

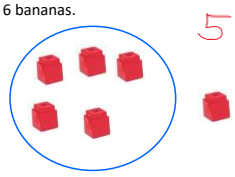
From *Math in Practice* for Grade 1 (Heinemann, 2016)

Exploring -1

Read *Baby Goes to Market* by Angela Brooksbank

Investigate: 1 for Baby

Show Baby's 6 bananas.



Baby ate 1.
How many did Baby have left to put in the basket?

Record Students' Ideas

Drawing	Number baby was given	Number baby put in the basket
	6	5
	3	2
	4	3

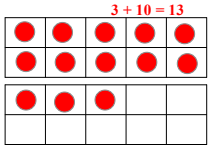
What do you notice?
What if Baby was given 7 mangos and ate 1? How many would Baby have left?
Try it. Were you right?
What happens to a number when we subtract 1?

Adapted from *Math by the Book* for Grade 1 (Heinemann, 2021)

Exploring +/-10 Facts

Read *Thanking the Moon: Celebrating the Mid-Autumn Moon Festival* by Grace Lin

What if Mama put 10 more mooncakes on the plate? How many mooncakes would be on the plate then?



MATH BOOK

Share your answers.

3 + 10 = 13
5 + 10 = 15
6 + 10 = 16
8 + 10 = 18

Turn and talk:
What do you notice?
Does it make sense?
Predict the sum of 4 + 10.
Were you right? Try it and see.
Could you add 10 to a number without using the ten frames and counters? How?

MATH BOOK

Exploring Subtraction with Lanterns on a Windy Night

The children had 13 lanterns. 10 blew away. How many were left?

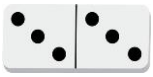
Exploring Doubles

Towers of Doubles

Spin a 1-10 spinner.
Build a tower to show the number.
Build the doubles model.
Say and write the equation.
5 + 5 = 10
Roll again and repeat.

Find the Doubles Dominoes

Finish each equation.
1 + 1 = ___
2 + 2 = ___
3 + 3 = ___



Hole Punch Doubles

Fold a paper.
Punch 3 holes.

From *Mastering the Basic Math Facts in Addition and Subtraction* (Heinemann, 2011)

Exploring Near Doubles

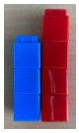
Read *Fish Eyes* by Lois Ehlert
Pick any two consecutive pages.
How many fish altogether?

Try a few more and record the math facts.

3 + 4 = 7
2 + 3 = 5
6 + 7 = 13
4 + 5 = 9
What do you notice about the models?
What do you notice about the equations?
Predict the sum of 5 + 6.
Try it. Were you right?

Big idea: How could you find the total without counting all of the cubes?

Models help students make sense of the big idea!



3 + 4 = __ 3 + 3 + 1 = 7

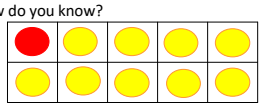
From *Mastering the Basic Math Facts in Addition and Subtraction* (Heinemann, 2011)

Exploring Facts with a Sum of 10

Read *Ten Flashing Fireflies* by Philomen Sturges

Fireflies in the Jar

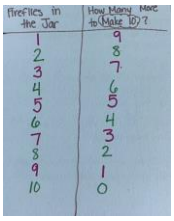
How many fireflies are in the jar?
How many more would they need to make 10 in the jar?
How do you know?



Put 2 fireflies in the jar.
How many more fireflies to have 10 in the jar?
Try more and record the findings.

MATH BOOK

Observing Our Data



What do you notice?
What patterns do you see?

MATH BOOK

Continued Work on Understanding
Bead Counters

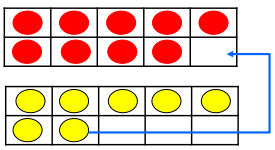
6+4=10

From *Math by the Book* for Kindergarten (Heinemann, 2021)

Exploring Using Tens

Read *Dinner at the Panda Palace* by Stephanie Calmenson
The 9 bears and 7 hyenas decide to sit at the same table. How many seats will they need?

9 + 7 = ___



MATH BOOK

9 + 7 = 16
9 + 5 = 14
9 + 8 = 17
9 + 6 = 15
What do you notice?
Does it make sense? Why or why not?
Predict: How many seats will they need for groups of 9 and 4 animals to sit together?
Try it. Were you right?
How can you find the sum of 9 + __ without using the counters?

MATH BOOK

From *Math by the Book* for Grade 2 (Heinemann, 2021)

For more resources to explore hands-on tasks, see:

Math in Practice **(Heinemann, 2016)**
This series is filled with lesson ideas, instructional strategies, sample teacher questions, practice tasks, and many online printable resources to make teaching K-5 math more meaningful and more fun. There is a book for each grade level K-5 that contains a wealth of grade-specific activities, as well as a *Guide for Teachers* filled with instructional strategies and an *Administrator's Guide* for math coaches and district math leaders. Visit the website at **www.mathinpractice.com** to view the materials. *Math in Practice* is PD in a book - like having a math coach for every teacher!

Math by the Book **(Heinemann, 2021)**
This k-5 series shows ways to teach mathematics through the context of children's literature. It is filled with lessons, games to practice skills, word problems, and lots of talk/writing prompts. Visit the website at **www.mathbythebook.com** to learn more.

Mastering the Basic Math Facts for Addition and Subtraction
Mastering the Basic Math Facts for Multiplication and Division
with John SanGiovanni (Heinemann)
Through investigations, teacher questioning, student discussions, visual models, children's literature, and hands-on explorations, students explore math operations, and through engaging, interactive practice achieve fluency with basic facts. Online resources contain customizable activities, templates, recording sheets, and teacher tools to simplify your planning and preparation. Reproducibles can be downloaded in English or Spanish.

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