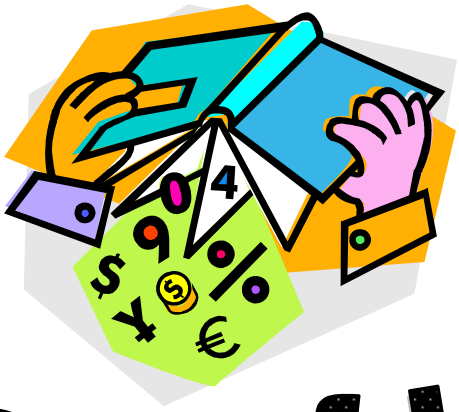
Mathematics:



A Story of Units

Parent Handbook

Grade 1

Module 1

Grade 1 • Module 1

Sums and Differences to 10

OVERVIEW

In this first module of Grade 1, students make significant progress towards fluency with addition and subtraction of numbers to 10 as they are presented with opportunities intended to advance them from counting all to counting on which leads many students then to decomposing and composing addends and total amounts. In Kindergarten, students have achieved fluency with addition and subtraction facts to 5. This means they can decompose 5 into 4 and 1, 3 and 2, and 5 and 0. They can do this without counting all. They perceive the 3 and 2 embedded within the 5.

In Topic A, we continue the work of developing this ability with all the numbers within 10 in *put together* situations, with a special focus on the numbers 6, 7, 8 and 9, since recognizing how much a number needs to make 10 is part of the Kindergarten standards and easier for most children. Students decompose numbers into 2 sets, or conceptually subitize, in Lessons 1 and 2 and record their decompositions as number bonds.

T: How many dots do you see?

S: 8!

T: What two parts do you see?

S: I see 5 and 3.

T: Did you need to count all the dots?

S: No! I could see the top row was a full five so I just said 6, 7, 8.

In Lesson 3, students see and describe *1 more* as + 1. They use the structure of the first addend rather than its cardinality just as the student speaking in the above vignette used the five. The number is a unit to which they can add one, or count on by one, without recounting. All three lessons are preparing the students to solve addition problems by counting on rather than counting all.

Topic B continues the process of having the students compose and decompose. They describe *put together* situations (pictured to the right) with number bonds and count on from the first part to totals of 6, 7, 8, 9, and 10. As they represent all the partners of a number, they reflect and see the decompositions, "Look at all these ways to make 8! I can see connections between them."

Through dialogue, they engage in seeing both the composition invited by the *put together* situation, and the decomposition invited by the number bonds. Expressions are another way to model both the stories and the bonds, the compositions and the decompositions.

In Topic C, students interpret the meaning of addition from *adding to with*

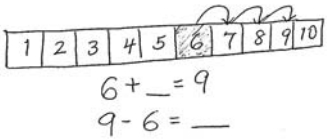
result unknown or *putting together with result unknown* story problems by drawing their own pictures and generating solution equations. Advancing beyond the kindergarten word problem types, students next solve *add to with change unknown* problems such as, "Ben has 5 pencils. He got some more from his mother. Now he has 9 pencils. How many pencils did Ben get from his mother?" These problems set the foundation early in the module for relating addition to subtraction in Topic G.

In Topic D, students work outside the context of stories for three days, to further their understanding of and skill with counting on using 5-group cards. The first addend is represented with a numeral, symbolizing the structure to count on from. The dot side is shown of the number to be added. Students count on from the first addend. They learn to replace counting the dots by tracking the count on their fingers to find the solution. In Lesson 16, they solve problems such as 4 + ___ = 7 by tracking the number of counts as they say, "5, 6, 7".

In Topic E, in the context of addition to 10, students expand their knowledge of two basic ideas of mathematics: equality and the commutativity of addition. The equal sign lesson precedes the lessons on commutativity in order to allow students to later construct true number sentences such as 4 + 3 = 3 + 4 without misunderstanding the equal sign to mean that the numbers are the same. The students apply their new generalization about the position of the addends to count on from the larger number. For example, "I can count on 2 from 7 when I solve 2 + 7!"

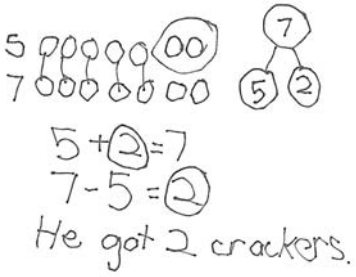
Like Topic E, Topic F leads the students to make more generalizations that support their deepening understanding of addition within 10. They learn to recognize doubles and doubles plus 1. They analyze the addition chart for repeated reasoning and structures (such as 5-groups, plus ones, doubles, sums equal to 10, etc.) that can help them to better understand relationships and connections between different addition facts.

Following the mid-module assessment, Topic G relates addition to subtraction. Since Module 4 in Kindergarten, students are very familiar with subtraction as "take away." During the fluency portion of the lesson in Topics A through F, students have had opportunities to remember their Kindergarten work with subtraction. Therefore, Topic G can start immediately with the concept of subtraction as a missing addend, just as in Grade 3 students learn division as a missing factor in a multiplication problem.



Having already worked with *add to with change unknown* problems earlier in the module, students return to revisit this familiar problem type, reinterpreting it as subtraction. The topic then uses the strategy of counting with both 5-group cards and the number path to solve subtraction problems.

"Ben had 5 crackers. He got some more. Now he has 7. How many crackers did Ben get?"



Topic H is analogous to Topic C. Students interpret the meaning of subtraction as they solve different problem types involving subtraction. Rather than using formal drawings or tape diagrams, throughout Module 1 students are encouraged to make math drawings that flow from their understanding of the stories. They engage in dialogue to relate their drawings to number sentences and explain the meaning of the subtraction symbol.

Topic I follows a week of intensive work with story problems to work on a more abstract level by visiting methods for subtraction involving special cases, subtracting 0 and 1, subtracting the whole number, and subtracting one less than the whole number. These two lessons are followed by three lessons in which students use familiar decompositions (5-groups and partners of 10) to conceptualize subtraction as finding a missing part.

Finally, in Topic J, students analyze the addition chart for repeated reasoning and structures that support their journey towards fluency with subtraction within 10. The module closes with a lesson wherein students create sets of related addition and subtraction facts and use dialogue to explain their found connections ($7 = 4 + 3$, $7 – 4 = 3$, $4 + 3 = 3 + 4$,
$4 = 7 – 3$, etc.) They began the module with very basic counting on, and end the module both with the skill to count on and significant movement towards the goal of fluency, achieved as the second addend does not need to be counted or can be counted very quickly.

Please note that the assessments should be read aloud to the Grade 1 students.

Terminology

New or Recently Introduced Terms

Count on (Students count up from one addend to the total.)

Track (Students use different objects to track the count on from one addend to the total.)

Expression (e.g., 2 + 1 or 5 + 5.)

Addend (One of the numbers being added.)

Doubles (e.g., 3 + 3 or 4 + 4.)

Doubles plus 1 (e.g., 3 + 4 or 4 + 5.)

Familiar Terms and Symbols

Part (e.g., "What is the unknown part? 3 + ___ = 8")

Total and whole ("What is the total when we add 3 and 5?" Use interchangeably instead of sum.)

Label (Students label math drawings using letters or words to indicate the referents from the story's context.)

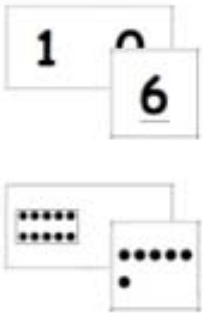
Addition, equal, and subtraction signs

Equation and number sentence (Use interchangeably throughout the module.)

Number Bond, a graphic showing part/part/whole

Equal sign (=)

5-groups (as pictured in the dot cards to the right), 2 rows of 5



Hide Zero Cards

Suggested Tools and Representations

Number Bonds

Addition Chart

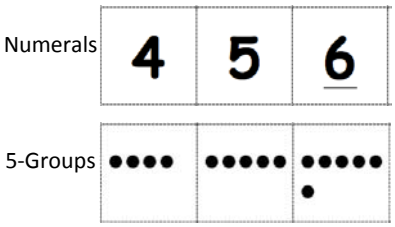
Rekenrek

Counters

Number Path

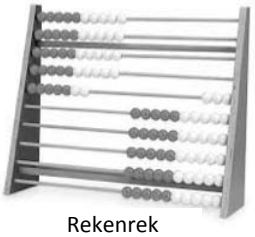
5-Group Cards

Hide Zero Cards

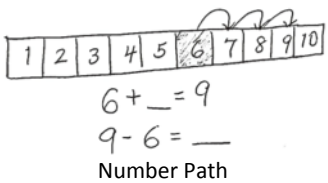


5-Group Cards

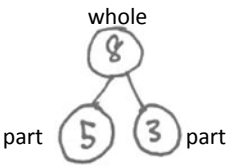
1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9
2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8	
3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7		
4+0	4+1	4+2	4+3	4+4	4+5	4+6			
5+0	5+1	5+2	5+3	5+4	5+5				
6+0	6+1	6+2	6+3	6+4					
7+0	7+1	7+2	7+3						
8+0	8+1	8+2							
9+0	9+1								
10+0									



Rekenrek



Number Path



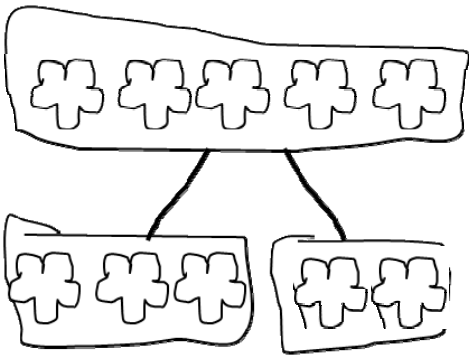
Number Bond

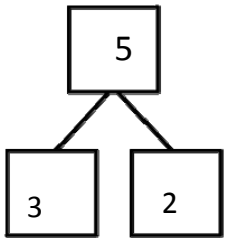
Lesson 30

Objective: Solve *add to with change unknown* math stories with drawings, relating addition and subtraction.

Solve the math stories. Complete and label the number bond and the picture number bond. Lightly shade in the solution.

Jill was given a total of 5 flowers for her birthday. She put 3 in one vase and the rest in another vase. How many did she put in the other vase?





3 + 2 = 5

5 - 3 = 2

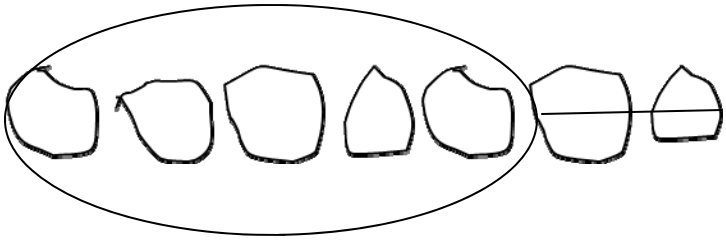
Lesson 31

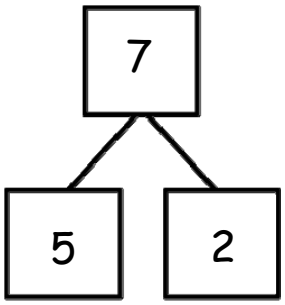
Objective: Solve *take from with change unknown* math stories with drawings.

Make a math drawing and circle the part you know. Cross out the unknown part.

Complete the number sentence and number bond.

Kate made 7 cookies. Bill ate some. Now Kate has 5 cookies. How many cookies did Bill eat?





Bill ate ___2_____ cookies.

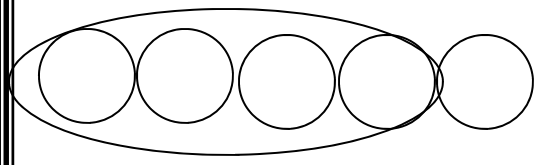
7 - 5 = 2

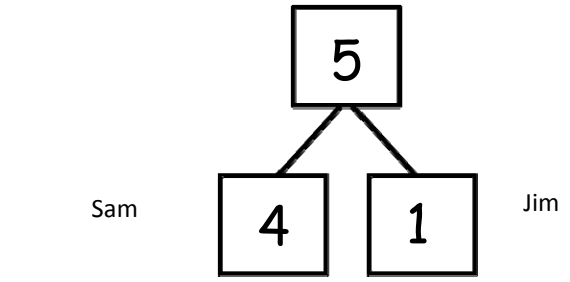
Lesson 32

Objective: Solve put together/take apart with addend unknown.

Solve. Use simple math drawings to show how to solve with addition and subtraction. Label the number bond.

There are 5 apples.
4 are Sam's. The rest are Jims.
How many are Jim's?





4 + 1 = 5

5 - 4 = 1

Lesson 33

Objective: Model *0 less and 1 less* pictorially and as subtraction number sentences

Cross off, when needed, to subtract.

6 – 1 = _5__

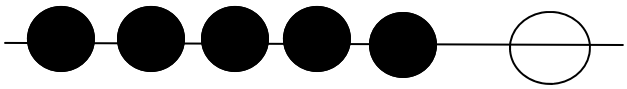
6 – 0 = __6_

8 – 1 = _7__

Lesson 34

Objective: Model n-n and n-(n-1) pictorially and as subtraction sentences.

Cross off to subtract.



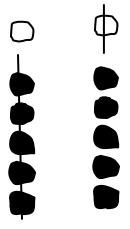
6—6 = 0

9—8 = 1

Lesson 35

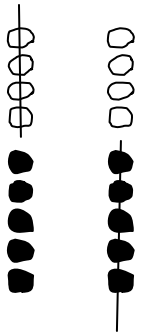
Objective: Relate subtraction facts involving *fives and doubles* to corresponding decompositions.

Solve the sets of number sentences. Look for "easy groups" to cross off.



6—5 = 1

6—1 = 5



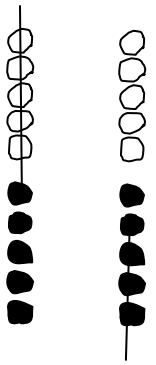
9—4 = 5

9—5 = 4

Lesson 36

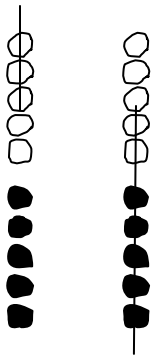
Objective: Relate subtraction from ten to corresponding decompositions.

Solve the sets. Cross off on the 5-groups.
Use the first number sentence to help you solve10 the next.



10—6 = 4

10—4 = 6



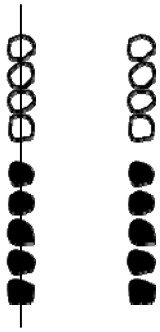
10—3 = 7

10—7 = 3

Lesson 37

Objective: Relate subtraction from nine to corresponding decompositions.

Solve the sets. Cross off on the 5-groups. Write the related subtraction sentence that would have the same number bond.



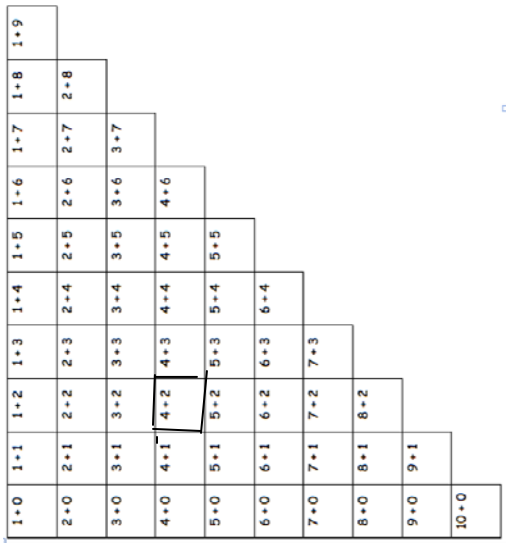
9—9 = 0

9—0 = 9

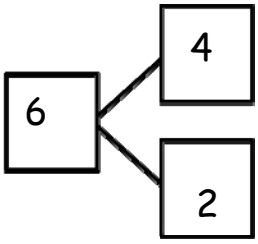
Lesson 38

Objective: Look for and make use of repeated reasoning and structure using the addition chart to solve subtraction problems.

Directions: On your addition chart shade a square orange. Write the related subtraction fact in a space below with its number bond. Color all the totals orange



6—4 = 2



Lesson 39:

Objective: Analyze the addition chart to create sets of related addition and subtraction facts.

Directions: Choose an expression card and write 4 problems that use the same parts and totals.

9—1 = 8

8 + 1 = 9

9—8 = 1

1 + 8 = 9

7—5 = 2

2 + 5 = 7

7—2 = 5

5 + 2 = 7