Grade 1

Critical concept: Number concepts to 20

<table>
<tr>
<td>Curricular content

Number concepts to 20
-counting on and back
-skip counting by 2’s and 5’s
-sequencing
-comparing

Ways to make 10- then 20
-recomposing and decomposing</td>
<td>Examples and Strategies

Ten frames: subitizing to 10
-recognizing quantity to 20 using ten frames

-Sets: being able to build sets of a given quantity. We aim to get students to be able to do this without “erasing” their pile. For example, if they have built a set of 8, can they then just add to it to make a set of 12? Or remove counters if you want a set of 5?

<u>Sequencing</u>: being able to put the numeral cards into a number line without having to do so in order: for example, if the first card you get is an “8” then put it somewhere a little less than half way if you are making a number line from 0-20. If the next number is 19, then it goes very close to the end. Watch for students being able to do this without having to find each card in order (that’s the goal). We are looking for students making connections about the magnitude of the difference between two numbers (or numbers in relation to each other).

Example 2 8 10 19

<u>Decomposing and recomposing numbers to 10- then to 20</u>.
-splitting a number into its parts: for example to decompose 8 you may have 5 and 3; 7 and 1 etc
To decompose 14 you may have 10 and 4; 12 and 2, 8 and 6; 7 and 7</td>
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<tr>
<td rowspan="2">Language
Subitizing: to know a quantity at a glance without having to count

Decomposing: breaking the number into parts

Recomposing; put parts together to make a whole

Complement: amount you must add to something to make it “whole”
e.g. complements to 10: 8 and 2</td>
<td>Recomposing is putting the parts back together. For example if you are adding 8 + 5 you could decompose 5 into 3 and 2. Then you have 8 + 2 is 10 + 3 You recompose by adding 10 and 3 to make the final total of 13.

-<u>Important to develop the benchmark of 10.</u> How many more would be needed to make 10? How many more than 10 is this number?
-<u>Complements</u> to 10: example 7 and 3 make 10; 6 and 4 make 10
-many students will have troubles with finding the complement if the number given is the smaller of the two. For example 3 and ? make 10. Make sure to do it both ways.</td>
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<td>Where does this lead?
Addition and subtraction initially to 18 then higher</td>
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Grade 1

Critical concept: Addition and Subtraction to 20

Curricular content

Addition and Subtraction to 20

Language

Compensation: taking one number to the nearest 10 (or 100 etc).
Watch for the difference between compensation in addition and compensation in subtraction.

In **addition** you keep the total quantity the same by moving some from one number to the other in order to make the numbers easier to work with.

In **subtraction** you must keep the magnitude of the difference between the two numbers the same, so if you add some to one, you do the same to the other.

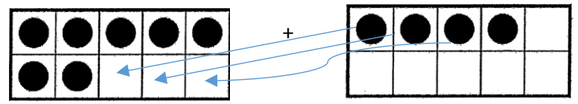
Decomposition: taking apart a number. A number can be expressed as a sum of its parts. Sometimes it means by place value, and sometimes it can be into two or more pieces.
Example: 14 can be easily decomposed into 10 and 4
However, it can also be decomposed into 7 and 7 , or 8 and 6 etc. This becomes really important when factoring in high school

Examples and Strategies
We teach multiple strategies so that we can choose the most efficient strategy to use depending on the question. Therefore, we need to make it really clear as we get better and better at the strategies, which ones would be most efficient in any given situation, while realizing that the strategies will all yield the same result.

Counting on: example 8 + 5 can start at 8 and count on 5 more.
Doubles: example 7 + 7

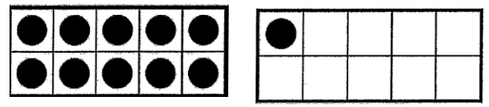
Near doubles: example 7 + 6 should be able to think flexibly about this. You can do either 7 + 7 then subtract 1; OR you can think 6 + 6 and add 1

Compensation: this is where the anchor of 10 becomes so important. Use ten frames to illustrate.



Think "how many more to 10?"

Think 7 + 3 + 1 =



Think "how many to get to 10, then how many more to still subtract.
E.g. starting at 15 means 5 to get to 10, and 7 is 5 + 2 so take away 2 more

Addition and Subtraction by **decomposition**

Addition

13 + 5
= 10 + 3 + 5
= 10 + 8
= 18

Subtraction

a) 14 – 8 = is like 10-8 + 4 OR 14 – 4 – 4
b) 15 – 7 is like 10 – 7 + 5 OR 15 – 5 – 2

Where does this lead?

Grade 3: 267 + 128 by compensation is 265 + 130 (took 2 from the 267 to make 128 to the nearest 'full 10 frame' of 130)
Subtraction: 267 – 128 "keep the magnitude of the difference the same so add 2 to each number" 269-130 = 139

Grade 10: $3x^2 + 5x - 12$
$3x^2 + 9x - 4x - 12$
$3x(x + 3) - 4(x + 3)$
$(3x - 4)(x + 3)$

SD83 District Numeracy committee