The Evolution of a Number Bond

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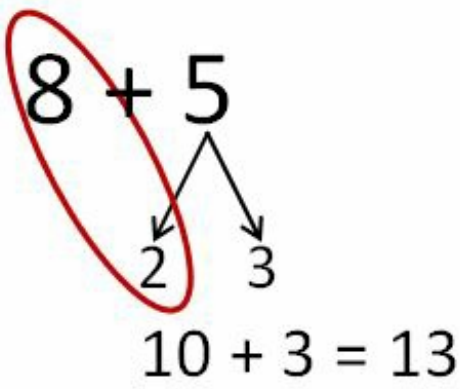
Donna Boucher 8/4/2013

Last week I wrote about the importance of number bonds and ways to develop an understanding of number bonds in young children. Today, I want to take that idea a step farther and make a case for just how important the concept of composing and decomposing is.

According to the CCSSM, Kinder kiddos should "fluently add and subtract within 5 (K.OA.5)" and "for any number from 1 to 9, find the number that makes 10 when added to the given number (K.OA.4)". For more information on how to develop those two skills, be sure to check out the other blog post.

So let's look at this example, which shows *one way* a 1st Grade child might determine the sum of 8 and 5 ("add and subtract within 20…use strategies such as…making 10" 1.OA.6) using the skills he learned in Kindergarten. The student knows he wants 2 more to put with the 8 to make 10 (K.OA.4), and he knows he can decompose 5 into 2 and 3 (K.OA.5). So now he is thinking of 10 + 3, or 13.

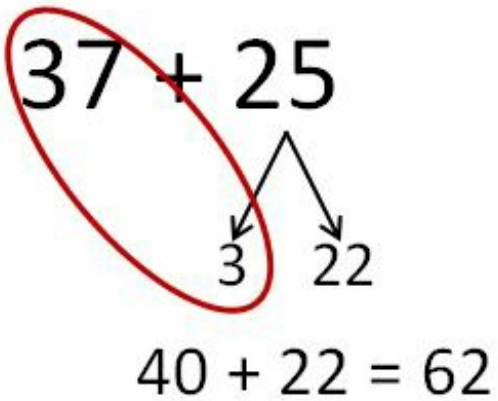
Let's move on to 2nd Grade, where students are expected to "add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction (2.NBT.5)". Now our student is faced with finding the sum of 37 and 25, which would normally be thought of as a "regrouping" problem. This student is still looking to make 10s, so she knows she needs 3 more to make 37 into 40. And notice that she is really still splitting 5, even thought now it's actually 25. After splitting, she's got an easy mental problem in 40 + 22.



Not sold yet? Let's move on to fractions. In 4th grade, students must "decompose a fraction into a sum of fractions with the same denominator in more than one way (4.NF.3b)" and "add and subtract mixed numbers with like denominators (4.NF.3c)". Let's see how our number bond knowledge can help here. We split the 4/5 into 2/5 and 2/5 (4.NF.3b) to create a whole out of the 3/5, resulting in 1 2/5 (4.NF.3c). Seems a bit easier than finding an improper fraction and then introducing a totally different procedure for converting it to a mixed number.

How about measurement? Elapsed time maybe (3.MD.1)? Doesn't this actually mirror what we do when we calculate elapsed time mentally?

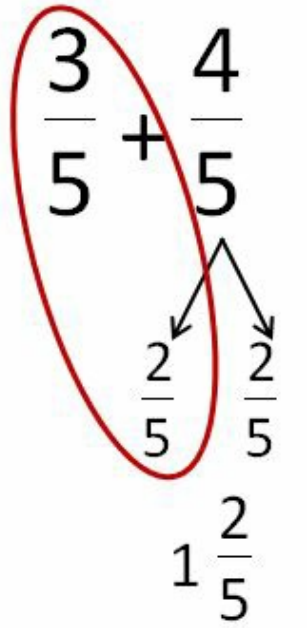
Or adding and converting measurement units (4.MD.2)?

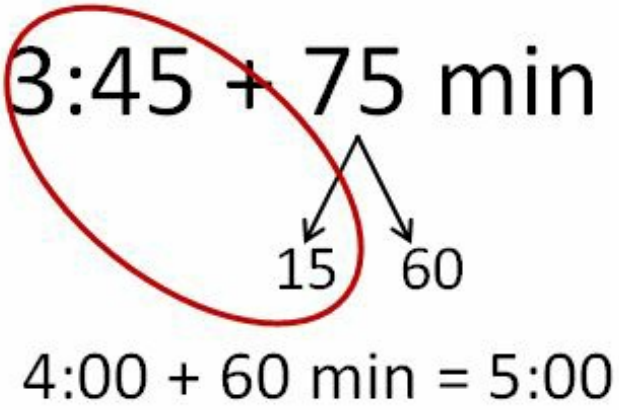


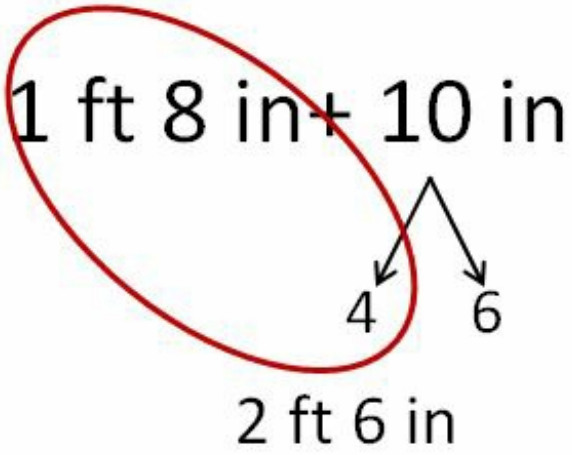
Notice that all of these examples follow the same format for recording the "splitting" process, and that it all starts in Kindergarten! Which brings me to another point–the power of vertical conversations. Be sure you have a process in place to discuss math instruction across grade levels. If there's not a formal process (vertical teams, professional learning communities, etc.), start one or just begin dialoguing with your peers on other grade levels.

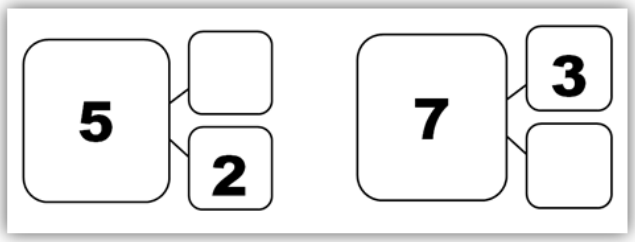
I'd love to hear your comments, as well as other applications of composing/decomposing that you have used or might have thought of based on these examples.

Are you ready to get started with number bonds? Grab a set of number bond cards!





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2
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Donna

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