Teaching Number Bonds

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Donna Boucher 7/25/2013

I recently returned from the National Conference on Singapore Math Strategies in Vegas, and it was a fabulous week of learning! Any conference that kicks off with a keynote speech by Ron Clark has got to be great, right? If you have not heard of him or don't know about his Ron Clark Academy, you need to check it out!

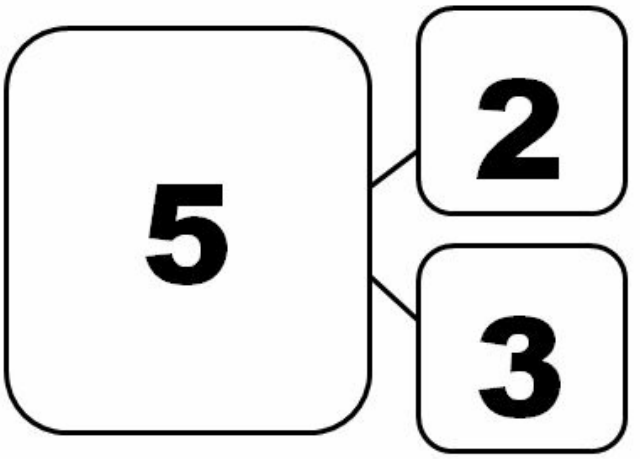
A big takeaway for me from the conference is how misunderstood "Singapore Math" really is. I think if you asked people to tell you what they know about Singapore Math, many would say, *Oh, that's model drawing*. And while that's one part of it, it really starts much earlier than that with their incredible routines for building number sense. Enter number bonds, a cornerstone of Singapore Math.

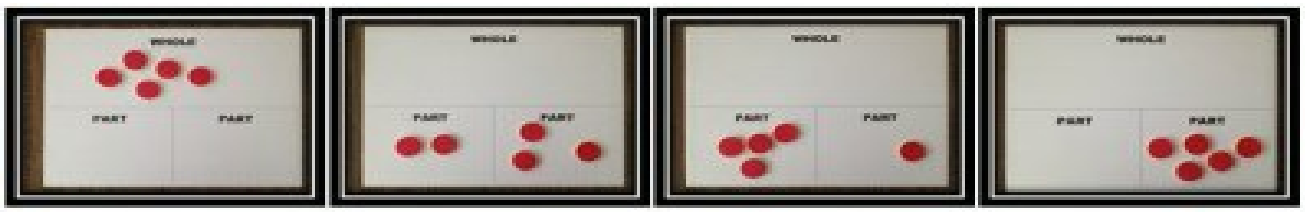
In her book *Why Before How: Singapore Math Computation Strategies*, Jana Hazekamp explains number bonds this way:

Number bonds help students see that numbers can be "broken" into pieces to make computation easier. With number bonds, students recognize the relationships between numbers through a written model that shows how the numbers are related.

A number bond for the numbers 2, 3, and 5 might look like the model below. I have also seen the whole on top with the parts branching down.

You might notice a similarity to fact families, and you'd be right. There are a couple of differences, however. First, we often teach fact families through rote memorization only. Kids can rattle off 2 + 3 = 5, 3 + 2 = 5, 5 – 2 = 3, and 5 – 3 = 2, but they often don't *really* understand how the addition and subtraction sentences are related. Second, we don't usually focus on all the fact families for a given number, for example 5. Through working with number bonds, children learn that 2 and 3 make 5, but so do 4 and 1. In other words, they experience multiple ways to *decompose* the same number. Start out working with smaller numbers and gradually work toward larger ones, and of course the kiddos will need LOTS of concrete practice. The part/part/whole mat pictured below is a great tool.



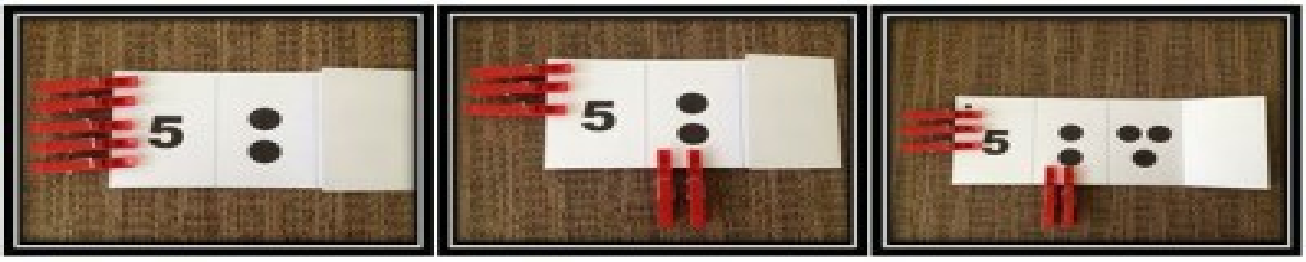


To explore combinations for 5, start with 5 counters in the Whole area of the mat. Ask kiddos to move their counters into the two parts. Avoid saying, "Move 2 counters to one part and 3 to the other." Let them explore and come up with their own combinations. Record the combinations as number bonds on an anchor chart. Keep asking the kiddos to 'show you another way' until all combinations have been recorded.

An easy game that provides concrete practice for number bonds is Shake and Spill. Working with a target number, for example 6, children shake and spill that many counters onto the playing board. In the picture below, the central graphic is a duck. Some of the jacks fell on the duck and some off. The combination would be recorded 6 = 3 + 3 or 3 and 3 make 6 or some other variation. Then they pick up the 6 counters and shake and spill again. Notice that I put the playing board inside the workstation box to contain the jacks!

You can grab your free Quack Attack Shake and Spill by clicking here.

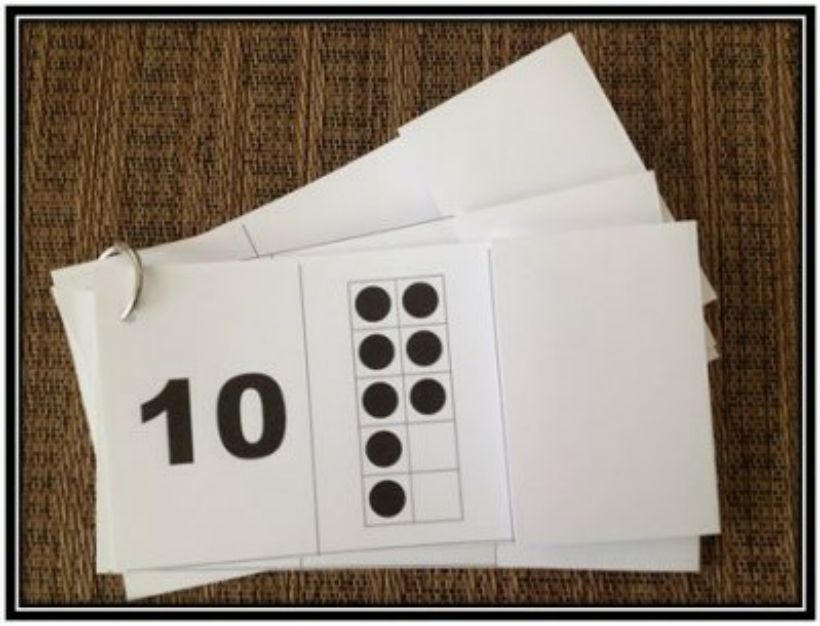
Once kiddos have had lots of practice creating and recording number bonds, you can move to missing part activities. The flashcards shown below are based on a Van de Walle activity. Notice how this one activity combines concrete (clothespins or counters), representational (dots), and abstract (numeral) learning. A perfect extension would be to have students write the number bond for each card they use.



The right side of each flashcard folds over to hide one of the parts. Students can use manipulatives, like the clothespins shown here or the counters shown below, to 'act out' the number bond and find the missing part.

Here, two color counters are used.

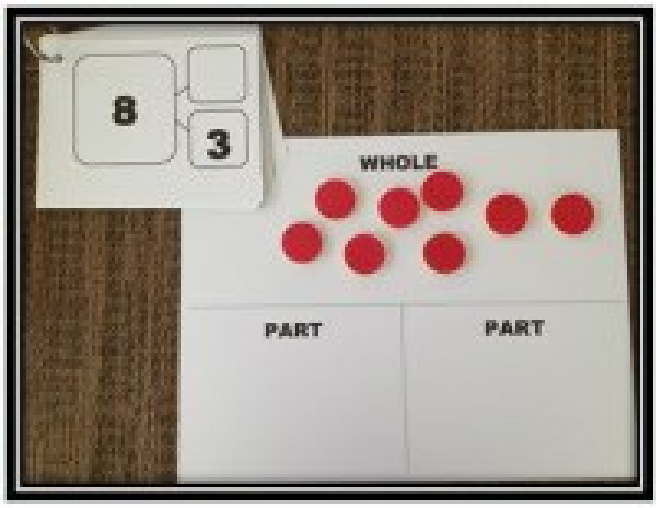
After the kiddos have had lots of concrete practice with the missing part flashcards, you can use them as actual flashcards, asking the kiddos to tell you the missing part.

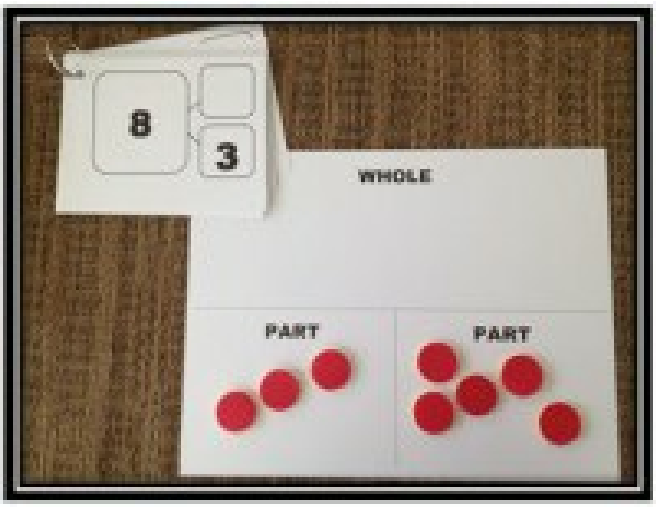


This is part of the missing part flashcard set. I used a ten-frame for the combinations for ten instead of the random dot patterns.

You can pick up your own set of missing part flashcards here.

This is such a critical skill, and there's no such thing as too much practice for your Kinders and Firsties! You'll want to have many different ways for them to experience number bonds without getting bored. Pictured below you see another missing part activity using number bond cards. Use together with the part/part/whole mat for concrete practice when you first introduce them.





BTW, did you read my post on [number bracelets] a few days ago? Do you now recognize that as just another

number bond activity?

Finally, if you want to check out where a number bond goes after Kindergarten, check out [this post](#).

Donna