

Hi everyone.

Last summer, my family had one of my cousins come visit with her 2 sons from Korea. It was the first time that Ryan and Lauren got to experience how to interact and play with their native-Korean relatives. And since they were about the same age as our kids, well, let's just say that it was fun, exhilarating, and utterly exhausting all at once (I don't know how you folks with more than 2 kids do it!).

As everyone with kids already knows, the approximate mess that kids leave behind after playing is 1.5 x actual number of kids frolicking in that given environment. So, in our case, let's see... 1.5×4 kids = a mess equivalent to what 6 kids create on any given day. Add Lauren and Ryan's 2 cousins into the mix and we arrived at a royal sum of 1.5×6 kids, or carnage close to what 8 kids can make in a single day!

Now don't get me wrong, the kids had a fabulous time, one big summer party. In fact, knowing a bit about the tough education system in Korea that my cousin's kids were facing, I really tried to go easy on the "let's clean this mess up!" department. And believe me; the concept of education is taken to a whole new level of seriousness there, almost to a religious level. Just to give you an example, the overall best-selling book in Korea last summer was "Siwon School Basic English", a reference book on (you guessed it) learning English. In fact, this book was the overall #1 best seller for 3 weeks in a row last summer!

But before I go on, I want to profess (confess?) that I'm not an expert in the Korean education system. Furthermore, my information about Korea's educational system came from one person, my cousin. So, if anything, please treat this information as a glimpse into one mom's view (i.e., my cousin's view) regarding how basic math is taught to Korean 1st graders these days.

And why do I think that writing about the Korean approach into teaching basic math is worthy of an article? Well, Korean kids have consistently scored well on math in international tests in the past several decades and, correct me if I'm wrong here, but these Korean kids have always scored higher than our own kids here in the good 'ole US of A. So, I think this article will give you a brief snapshot of what it takes to be a Korean student just as she enters into the first 1st grade math class. Fair enough? Ok - let's see what Korean basic math is all about.

Just like our country, Koreans begin teaching math starting with the basics - counting, adding, subtracting. But the way that adding and subtracting is taught already diverges from the very beginning.

Addition

Let's take addition. Addition is, literally, taught as a definition for how things are counted into a total number. Nothing strange about that. But here's where it gets a bit different. Aside from endless drills and practice sets of simple problems, the focus on the very first set of literally hundreds of practice problems is the mastery of the number "10". So for example, the student will solve endless simple addition problems with "10" in them, whether it's 10 plus another number or a seemingly endless set of problems in which one number plus another number equals 10.

How Koreans Teach Basic Math (9/14/09)

Why this fascination with this double-digit number? Because once the student realizes that there are different combinations of numbers galore that add up to 10 AND that any single digit number plus 10 is just the "0" in the "10" replaced by that single digit number that is being added to the "10", then the student can be introduced to solving these simple addition problems by performing...subtraction.

Huh?

That's absolutely right. The objective for the student to be able to solve these addition problems related to the number "10" in her sleep is to start realizing that certain addition problems can also be solved by performing some subtraction! Here's how this concept would be taught (and please realize this is taught after the student has mastered all sorts of addition problems related with the number "10"):

Let's assume that the addition problem is $16 + 8$. First, we need to address the ones digit to add the 6 and 8. Start at the larger value (i.e., 8) and ask yourself, "how many more do I need to make this 8 into a 10?" 2. Now the "8" will turn into a "10". But you needed to borrow the "2" from the other ones digit (i.e., 6), because borrowing a number MUST come from another number. Therefore, the "6" decreases to a "4". Now, the problem is rewritten into: $10 + 4$. Since the student has done "10 + x" problems ad-nauseam by now, the student can just arrive at 14 in her head.

Did you see the subtraction problem that happened within this addition problem? It was when the student had to reduce the 6 into a 4 because she borrowed 2 from the 6.

By intuitively learning how to subtract before the concept of subtraction is introduced, this method, although it takes longer to learn than the trusty "fingers method" that I learned back in day, enforces the concept that math problems can be solved in many different ways. In other words, an addition problem can be solved by applying subtraction techniques.

Another interesting tidbit - because of this way of teaching addition, my cousin's sons think of subtraction to be easier than addition, which is usually the exact opposite thinking in the U.S. (i.e., addition is intuitively easier than subtraction).

Subtraction

Now let's look at subtraction. Just like addition, Korean kids are taught that addition techniques can be used to solve subtraction problems.

Let's assume that the subtraction problem is $35 - 8$. First, we need to address the ones digit to subtract the "8" from the "5". But of course, you cannot subtract a bigger number from a smaller number (at least not in 1st grade). So, you need to ask yourself, "how many more do I need to make the '8' into a '10'?" 2. Now, the "2" that is needed to turn the "8" into a "10" is added to the "5" to arrive at a "7" in the ones digit. As for the tens digit, since you needed to borrow 2 to make the "8" into a "10", that "2" needed to come from the "3" in the tens digit (i.e., 30). Therefore, you need to take away 1 from the "3" to get to a "2" in the tens digit. Combing the answers in the tens and the ones digits gets you to an answer of "27". Trust me, it's a lot easier trying it out and understanding yourself than reading my instructions above - try it with other numbers and you'll see.

So what does learning subtraction in this method teach the Korean kids? It teaches them that addition can be used to solve subtraction problems.

If anyone feels a little confused by all this seemingly counterintuitive “for-addition-use-subtraction” business and vice-versa, there is a method to all this madness. You see, it comes down to the philosophy of mathematics as the Korean student enters 3rd-4th grade. But before I move onto mathematical philosophy, the last thing I want to say about all this “simple” addition and subtraction is the following: remember when I told you that there were endless amounts of drills that the student solved when first learning all addition problems related to the number “10”? To be more specific, there are levels of these specific problems that the student needs to complete, with each level amounting to a small paperback volume. There are usually 4-5 volumes of books of problems that the Korean student needs to solve BEFORE SHE EVEN ENTERS THE FIRST GRADE.

What all this boils down to is that formal first grade math is really a review of the volumes of work that the student completed before even setting foot into the classroom! If the student does not perform well in class, the teacher will immediately contact the parents to discuss why she didn’t complete her volumes during the summer. So as you can see, the parents end up teaching the student all the new concepts while the teacher is really reinforcing what the parents taught the kids in the first place.

OK. Sorry for that digression, but I think it was important to share how much effort is required to master addition and subtraction in Korea. Now let’s talk philosophy.

Mathematical Philosophy

As I stated above, the reason for teaching opposite approaches for solving math problems is because students not only learn “straightforward” math, but also mathematical applications that approach philosophical levels – I’m not trying to talk all smart here, but rather attempting to translate the meaning behind my cousin’s statement when she said, “And kids are not only taught to solve problems that have simple answers, like $1 + 1$, but they’re also expected to solve math problems with no straight forward answers, answers which have to be explained in writing”. Wait a minute. Math problems that need to be explained with words rather than numbers? Read on, brave souls.

Here’s an example of what Korean kids are learning at the 3-4 grade level, in addition to straight-forward math: If you’re looking at a cylinder, what shape does that cylinder change into when looking at it at from eye-level? Answer: a rectangle. This kind of problem helps the student understand that a given shape, when looking at it from a different angle, is a different shape altogether. So when anyone is asking what shape is this (insert any shape here)? The answer really is, “it depends on which angle you’re looking at it from”. Hence, no definitive answer.

Of course, all this learning and drilling does not come without costs. Those Korean kids are under some tremendous pressure to rise above ever-increasing competition in their society. Already, the 3rd grade child doesn’t come home until 8PM after all the after-school teaching programs, called “hagwons”, are finished (homework then follows until the end of the evening). And although I can’t be sure whether this level of drilling and practicing in Korea can be sustainable over the longer term, there’s no arguing that impressive results have been demonstrated for decades.

ProntoLessons.com

Articles

How Koreans Teach Basic Math (9/14/09)

My final thoughts on all this – while I think there are things very valuable that we can borrow here from the Koreans in the pursuit of education, especially when it comes to teaching basic mathematics, I definitely wouldn't recommend going to the full extent that modern Korean society is pushing their kids. Of course, that sort of flexibility in taking only the best parts of teaching math is perfect for homeschoolers like us.

See you next time!