

## Common Core Math in 1<sup>st</sup> Grade

The main ideas in first grade are addition and subtraction up to twenty, and starting to make larger numbers out of tens and ones. In the Common Core, kids will not only learn their number facts, but see them as related. This will help them not only learn these facts, but to build number sense.

For example, a child might learn their “doubles” — such as  $8 + 8 = 16$  — and from there know close facts such as  $8 + 7 = 15$  because it must be one less than  $8 + 8$ . Another child might prefer to see  $8 + 7$  as  $8 + 2 + 5$ , and then see that as  $10 + 5$  to get 15. This last approach of “making a ten” is key. Finding it this way will help kids remember it and will also be important for knowing the rules of arithmetic and eventually algebra.

Kids will be working in concrete ways with tens and ones — often with blocks, definitely with pictures — so that they know what it means make a ten or break one up. This process is called “regrouping” (we have called it carrying or borrowing in the past, but are we really “borrowing” if we never get it back?) to emphasize that the value of the number hasn’t changed. Eventually kids will be proficient with pencil-and-paper and even mental math, but using pictures or objects gives them a firm foundation for what they’re doing.

Another small but important change is that kids won't just see problems like  $3 + 2 = 5$  but also  $5 = 3 + 2$  and even  $3 + 2 = 1 + 4$ . Well-established research suggests the importance of activities like this to lay a proper understanding of the equal sign.

### Examples:

The game “Kiri’s Mathematics Matching Game” (see reverse) is like Memory, though one can even start with all cards face up as one is learning the game. The idea is to look for two numbers which add **or** subtract to give a target. So if the target is 6 and you turn over a 4 first you can look for 2 next, because  $2 + 4 = 6$ , or 10 because  $10 - 4 = 6$ . To figure out what you need to turn over, you can use the relationship between addition and subtraction, which is what the game is really about.

And far from the Common Core being “one size fits all,” this shows that even kids (in this case a 4<sup>th</sup> kid) can help create Common Core materials!

### Tips for parents:

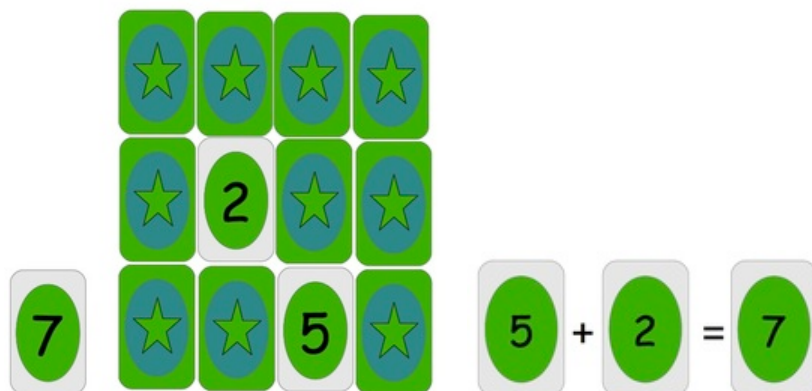
Here are some ideas for reinforcing the math at home.

- Talking about arithmetic out loud as it comes up in daily life is wonderful. “There are six of us at dinner and two cups already out; how many more cups do we need?” If you use cash, talking through money is terrific.
- There are many good games that promote good number sense, without your kids even noticing. For example, play the card game “War” but use two cards instead — so your  $5 + 3 = 8$  beats my  $2 + 5 = 7$ . Even better than just doing the addition in this case is reasoning that  $5+3$  wins because both have 5’s but the three is greater than the 2.
- If you want to give kids skill practice, it is better to have activities that encourage reflection. A website or worksheet which has kids do a “plus two” right next to a “plus three” will encourage them to make connections that reinforce recall.

## Example: Kiri's Mathematics Matching Game

<http://www.illustrativemathematics.org/illustrations/991>

- Students can play in groups of 2–4.
- An array of cards (12–20 in total) is placed face down and one card, called the target card, is put face up.
- The students take turns flipping over two cards, one at a time.
- If the sum or difference of the values on the two cards equals the value on the target card, the student who exposed those cards should say a number sentence to express the relationship. If they are correct, the three cards are removed and replaced so there is again a full array.
- If a student does not combine the values of flipped cards to make the value on the target card, then it is the next student's turn.
- In the no-memory-needed version of the game, all chosen cards are left face up (after an unsuccessful turn) and may be used to make matches. In the light-memory version, cards are left face up until there is a match, after which all are put face down. In the memory version, cards are put face down after an unsuccessful turn before the next player's turn.



In all versions, students must engage basic addition and subtraction facts. In the memory version, after a student has turned over one card, in order to know whether there is a match using cards they've seen, they need to solve equations of the form

$$\square + b = c \quad b + \square = c \quad \square - b = c \quad \text{and} \quad b - \square = c.$$

Students could also be asked to record the number sentences they make.

Teachers could make cards, or have students make them, or use numbered cards from a standard deck or by taking cards from other games. Zeros would be appropriate, and “wilds” could also naturally be incorporated. The target card values should be up to 20 to fully meet the standard (with target cards kept separately). To extend, and incorporate Standard 1.OA.7 into this activity, there could be two target cards to match in total or difference and/or students could flip over three cards and possibly use all of them.

Note: This game was invented by Kiri, when she was a first grader (now is a fourth grader).