

# Number Facts

By Malkin Dare

*It is very important that students develop “number sense”. To be good at math, they need to be completely at ease with numbers, totally fluent. Without this facility, students are constantly forced to interrupt their higher-order thinking when they get bogged down in the mechanical aspects of a problem. Those who have to resort to counting on their fingers or punching buttons on a calculator may well end up thinking they’re “not good with numbers” and may rule out dozens of possible careers. The Ontario curriculum stipulates that students be able to recall addition and subtraction facts to 18 by the end of grade 2; multiplication and division facts to 49 by the end of grade 3; to 81 by the end of grade 4; and to 144 by the end of grade 5. If your child is not at level, you might consider teaching him or her at home.*

## Addition and Subtraction

As with most new learning, you should break the task up into very small chunks and teach each one in a logical sequence, not proceeding from one to the next until the present chunk has been mastered. Begin by establishing what your child knows already, making sure that learning is solid. Then begin working on the next item.

Work on one number family at a time in the obvious sequence, starting with the 1 family. The associated number facts ( $1 + 0$ ,  $0 + 1$ , and  $1 - 0$ ) should be taught together. The members of the 9 family are  $9 + 0$ ,  $0 + 9$ ,  $8 + 1$ ,  $1 + 8$ ,  $7 + 2$ ,  $2 + 7$ ,  $6 + 3$ ,  $3 + 6$ ,  $5 + 4$ ,  $4 + 5$ ,  $9 - 0$ ,  $9 - 1$ ,  $9 - 2$ ,  $9 - 3$ ,  $9 - 4$ ,  $9 - 5$ ,  $9 - 6$ ,  $9 - 7$ ,  $9 - 8$ , and  $9 - 9$ . For numbers greater than 10, work on only number facts involving single digits (ie, do not teach  $11 + 3 = 14$ ).

Let’s say that your child has a rock-solid command of the number facts up to and including 4. You begin, therefore, with the number facts for 5. To get your child’s attention, place five Smarties in a pile on the table. Now move one of the Smarties to the other side of the table. Point out that there are still five Smarties: four in one pile and one in the other. Write  $4 + 1 = 5$  on a dry-erase board or piece of paper. Now move another Smartie from the original pile to the new pile. Talk about how  $3 + 2 = 5$  and write that down. Repeat until all the Smarties are together again. Now repeat the entire procedure, only writing down the related subtraction facts. Now, let your child eat the Smarties.

Next, start practising with (pre-made) flashcards. At first, just work on the 5 family facts, subsequently integrating already-mastered facts like  $2 + 2$  and  $4 - 1$  into the drills. Try to make the flashcard activities fun by holding contests with siblings, having your child try to teach his teddy bear, timing him, letting him test you, and so on. Short practice sessions (five minutes) are more effective than long sessions.

Another good way to drill these number facts is to create Mad Minute sheets. On a sheet of paper, create a  $6 \times 10$  grid and print in 60 questions involving numbers up to and including the 5 family. Challenge your child to do as many as possible in one minute. Continue with this exercise until he can get all 60 correct in one minute. Graph his scores and let him see his progress.

## Multiplication and Division

The principles for teaching addition and subtraction apply to multiplication and division as well. First, establish where your child is in the sequence and proceed from there. Don’t move on until he has learned the latest chunk thoroughly. With multiplication and division, the sequence is the 1 times family, then the 2 times family, and so on. Let’s say your child has a command of the number facts up to and including the 5 times family. You begin, therefore, with the 6 times family.

Show your child a grid of the facts he is setting out to master (if your child is in grade 4, for example, use a  $9 \times 9$  grid). Highlight the number facts he already knows. He will probably be surprised to see that there aren’t all that many left to be learned. Grade 4 students who know their facts up to and including the 5 family, for example, have only 16 sets of facts to go.

Turning to the 6 family, help your child to print the multiplication facts from  $6 \times 1 = 6$  through to  $6 \times 9 = 54$  on a dry-erase board. Taking each of the nine facts in turn, elicit from your child the related number facts (for example, for  $6 \times 4$ , they are  $4 \times 6$ ,  $24 \div 6$ , and  $24 \div 4$ ). Write these facts in three additional columns beside the original column.

Now introduce the (pre-made) 6-family multiplication and division flashcards and practise for a short time. As with addition and subtraction, make the sessions short, frequent, and snappy. Keep changing up the pace with Mad Minutes, contests, chanting the tables, games, timings, and so on. Once the 6 family is known well, add the earlier facts to the mix.

If a particular fact, let’s say  $6 \times 6$ , is giving your child a lot of trouble, make that the fact of the day. Try to think of ways to attach this fact to the Velcro in your child’s brain. For example, the number of combinations possible when you roll two dice is 36 ( $6 \times 6$ ). Try a silly poem — Got no lice, got no nits, six times six is 36. Point out that 36 contains a 6.

For the 9 family, there is a variety of ways to help students remember, including using the symmetrical and palindromic nature of the products (18, 27, 36, 45, 54, 63, 72, 81), all of which add to nine ( $1 + 8 = 9$ ,  $2 + 7 = 9$ , etc.).

Continue to practise the tables until the responses are automatic, instantaneous and accurate.

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