

Math Facts: Are They REALLY Important? By Julie Kotoff

Does the thought of teaching math to your children send shivers of fear down your spine? Do you have this reaction because you weren't very good at math yourself in school? I am amazed at the numbers of people who I meet who feel the same way you do! They say something like, "I am helping my child learn math really well because I wasn't good at math and I don't want her (or him) to be like me." My heart always goes out to these parents because they have obviously suffered at the hands of some or many teachers in their past. I apologize for all of them on behalf of teachers everywhere. I am truly sorry for the devastation and hurt that they have caused you either knowingly or unknowingly.

I was one of the lucky ones! I had a mom who took what the teacher said as the gospel truth. When my second grade teacher said that I needed to learn my math facts, I learned my math facts! I have a vivid memory of sitting at our dining room table at the direction of my mother and told not to get up until I had a huge stack of flash cards memorized. Things always seem much bigger when you are little. I am sure the stack of flash cards was no more than an inch high, yet in my young mind, it was at least six inches tall! Through many tears and lots of drama, somehow I learned my addition and subtraction facts. I don't have any recollection of learning my multiplication and division facts, but I did somewhere along the line. Obviously, it wasn't nearly as traumatic as learning the earlier facts! Because I had the tools under my belt to do math, I succeeded each year in math and it became my favorite subject.

How important is having the math facts mastered in early elementary school? May I make a comparison? Math facts are as important to math as a hammer and nails are to a carpenter! If my handyman showed up at my door in the morning to fix my broken fence without his tools and he tried to improvise using a thumb tack and a screw driver, I would send him home and call someone else. We all know that a handyman needs the correct tools to do the job. Likewise, a child needs his addition, subtraction, multiplication, and division facts to do his math page everyday. These are a child's tools to do math. I have seen it over and over again...the torture on a child's face who sits and stares down at his math page that he can't do because he doesn't have his math facts mastered. He has a thumb tack and a screw driver when he really needs his hammer and nails.

I have also seen that children can "get by" without knowing their addition and subtraction facts in first and second grades because they

can use their fingers to get the answer. It is doable to find the answer to $9+7$ on your fingers but almost impossible to find 9×7 . The child who knows his addition and subtraction facts thinks math is fun! The one who doesn't and can get the answer on his fingers thinks math is boring and hard. Once children enter fourth grade and fractions and long division are introduced, a child almost becomes handicapped at math at this point if those multiplication and division math facts are not mastered. On the other hand, those children who master these facts in third grade, go on to fourth grade math and soar. Nothing stops them except their inability to grasp the new concept, but not their computation skills.

So when is a good time to start memorizing math facts? As soon as a child understands the concept of addition he is ready to start memorizing his addition facts. This is around four or five years old. The first facts to have a four or five year old memorize are the doubles, from $1+1$ to $12+12$. Then once he understands what subtraction is all about, he can begin to learn them, as well. Third grade is the perfect age to begin having a child memorize his multiplication and division facts. There are a handful of addition, subtraction, multiplication, and division tricks that you can pass on to your children, but MOST just need to be memorized, one family at a time. Be sure that whatever is being memorized, your child has ample practice to USE what he is learning. The old adage "use it or lose it" applies here.

I have had parents tell me that their third grader is too young to learn his multiplication and division facts. I would have to differ because I have experienced first hand in my classroom hundreds of eight year olds learning their facts and becoming lovers of the subject of math. As it is with all of us, knowledge is power and when children have knowledge of math facts, they feel powerful for the first time in their lives. They may not be able to verbalize it or even understand what is happening in their brains, but something happens when a child acquires the tools he needs to do the job set before him. Instead of it being laborious and tedious, it actually becomes fun and exciting! I have third graders come into my classroom who say, "I hate math; math is hard". They leave after one short year in my classroom and now say, "Math is easy; math is fun". I am not a miracle-worker!! But what did happen in those ten short months with me was that I gave them all the opportunity to master their facts. It is the single BEST thing you can do for your child as far as the subject of math is concerned. It is right up there with teaching your children how to read. What I did in my classroom can and is being duplicated today in homes around the country.

So, what do I mean by "mastery"? I am so glad you asked! I can't tell you how many parents when asked if their children know their math facts tell me that they do, but it takes them a little time to get the answer. If they KNOW their facts, the answer comes automatically like it comes when I ask a child his name. Can you imagine if I walked up to your child and said hello to him and asked him his name and he hesitated for several seconds and then told me? It would be as if he were running down the names of all his family members in his head: "Let's see: my dad's name is Gene and my mom's name is Nancy. My oldest brother is Jeff and my younger sister is Chris. That leaves me!! My name is Tommy!" All of us would think to ourselves, "Wow, that boy doesn't know his own name. How sad!"

When it comes to mastery, there are three words to describe the different phases of mastery: accuracy, fluency, and automaticity. Accuracy is when I ask your child, "Johnny, how much is $8+4$?" He hesitates just long enough to count up from 8 to 12 in his head. He then tells me, "Twelve!" Is Johnny able to get the correct answer to the fact I just gave him? Yes, he is. But that is NOT mastery! That is accuracy.

Fluency is when a child can get the answer after a second or two. He is still having to think about the answer. "Johnny, how much is $8+4$?" After a couple of seconds he tells me, "Twelve!" He did not need to count up in his head or on his fingers, but he had to pause, think about it, and then answer. That is getting closer, but it is still not mastery!

Automaticity is when a child can spit out answer after answer without much thought, as if he were being asked his name. "So Johnny, how much is $8+4$?" Instantly he says, "Twelve!" Any math fact I throw at him, he can rapid-fire give me the correct answer. THAT is mastery!! You might be saying to yourself right now, my child CAN'T do that. Yes, he can!!! Children are SO amazing and can do so much more than we think they can! Children in early elementary can learn all their facts, but it takes purpose and hard work, just like anything else significant that we do. I dare you to try!!!

The last thought I want to share with you is the importance of tackling the math facts daily. How do you run a marathon? One step at a time! How do you do anything that is hard? You break the task down into small incremental steps and start attacking it! There are 342 addition and subtraction facts to master. That's why it takes three years to do it, from kindergarten to second grade. There are 286 multiplication and division facts to master, preferably in the third grade. I know there might be some parents of middle and high

schoolers reading this article and you are kicking yourself that you did not give your son or daughter the opportunity to conquer these facts years ago. It is NOT too late. It is never too late! Let me close with this email from Jennifer, mother of a 14-year old who is an excellent student in all other subjects EXCEPT math:

"I thought I'd drop you a note and let you know we are beginning to master our math facts. I guessed right: my poor teenager did not have a mastery of his basic facts. No wonder he doesn't like math-at all. I am seeing increased confidence as we move toward mastery, which is altogether priceless-an investment beyond measure. It's a wonderful thing to see, you know? Your child (though he looks me in the eye!) who is a gifted designer, artist, and builder, but struggles with math. He'll be in such a different place next year. My hope and prayer is that this will be a huge leap forward in giving his dreams and ideas the wings they need to fly."

How important is mastering the math facts? I think Jennifer's quote says it all! So...what are you waiting for?