



Singapore Math with Dawn Swartz

Lesson 16: Math Facts and Mental Math

Outline:

Math Fact Fluency and Mental Math

- **Math fact fluency** refers to basic math facts that one commits to memory. These are basic math facts of the four operations (addition, subtraction, multiplication, and division).
- **Mental math** is simply doing math calculations mentally in one's head. Doing mental math will require math fact fluency.

Math Facts

- Make provisions for practicing math facts because you will note in your curriculum that there is a lack of specific instruction for drilling math facts. **You need a plan for your school for drilling math facts.**
- “Math facts are to math as sight words are to reading.”
 - Children learn decoding rules for reading, however, these rules do not fit a sight word. Comprehension diminishes when students don't know these sight words and don't have a way to read the word.
 - If a student is stumbling over basic math facts while they are trying to learn any complex math, then they cannot learn the new concept.
- When driving to a new and unfamiliar place, all is well until the sky opens and there is a torrential downpour. You adjust things to move along and you reach your destination. Picture this same scenario, but you are now in a different car. When children don't know their math facts, it is like they are navigating in a storm in a car that is not their own.
 - The lack of automatic recall requires too much mental energy being spent trying to recall facts (or skip count, or double, etc.).
- It can take time to put together a collaborative ramp for practicing math facts in your school.
- Ideas for math fact learning to automaticity:
 - **First grade:** Begin drilling math facts, which is abstract, after learning concretely (with manipulatives).
 - Sometimes on the paper math facts are timed and sometimes they are not timed.
 - Math facts are repeated twice a day.





- Parents are informed and educated about what facts are worked on so they may also be worked on at home.
- **Second grade:** Practice addition and subtraction and repeated addition/multiplication.
 - Multiplication facts are added at the right time, not randomly.
- **Third grade:** Addition, subtraction, multiplication, and division
 - Students are allowed to skip unknown facts on a timed math fact test.
- **Fourth grade:**
 - You may not skip problems that you do not know.
 - These math facts must be solid in order to move further in math.
- **Fifth grade:**
 - New students are often far behind. The four basic math operations are reviewed in the beginning of the year. This helps to bring new students along.
 - 11s and 12s math facts are brought in.
 - Timed practices and tests are given for commonly simplified fractions and percentages.
 - By the end of fifth grade, students have math fact fluency.
- **Sixth grade:**
 - Students practice skills related to mental math.
- Ideas for math fact learning to automaticity:
 - On Monday students get a math fact packet.
 - They receive 8 practice pages that are the same, and they are the same problems as the math fact test they will have at the end of the week.
 - The students number the math fact sheets (1a, 1b, 2a, 2b...).
 - In class, students work through the math fact sheet for a limited time. The students check their work.
 - Model for students how to read the answers in groups of three.
 - Any problems unfinished in class are to be completed for homework.
 - Practice packets are used Monday through Thursday. A timed fact test is given on Friday.
 - You could store fact practice sheets and keys in a binder.
 - Where to find math fact practice sheets:
 - Math Fact Café (Mathfactcafe.com)
 - Math Drills (Math-drills.com)
 - The purpose of the fact packet is to practice. On Friday mornings, the students exchange packets and check them for completeness.
 - Save the math fact packets for students who are struggling.
 - Some students as for extra practice sheets. You may want to have extra packets to give to them.



- If you know your math facts and they are automatic, they are fast. If you are thinking through math facts they are still not automatic.
- If a student is struggling with math facts, you will need to partner with parents and they are going to need to help you at home.

Mental Math

- Mental math is going to rely on knowing basic math facts and number sense.
- Mental math can only be built upon a conceptual understand of math and problem solving skills. This will enables your student to have a variety of strategies to solve problems.
- Plan mental math strategy practice that is built onto what they are already working on. In the US edition curriculum there are references to mental math practice.
- Other resources for mental math practice:
 - Math Express
 - Sprints
- Get started with mental math practice even if it is not all planned. Think through your plans and talk to more experienced teachers about mental math practice.