Increasing Math Fluency at Home
Submitted by Liz Vincent, Morse Math Coach

The Massachusetts Mathematics Curriculum Frameworks, adopted in March 2017, outlines the math fluencies that each student needs to develop at every grade level. According to the frameworks, students reach fluency by building understanding of mathematical concepts and by building automaticity in the recall of basic computation facts (10).

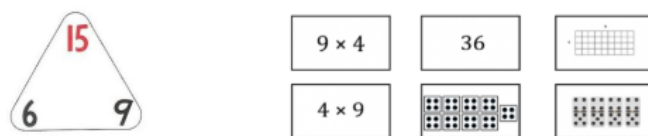Here are the fluency requirements by grade level:

Grade	Fluency Requirements
K	Fluently add and subtract within 5, including zero. (K.OA.A.5)
1	(Add and subtract within 20,) demonstrating fluency for addition and subtraction within 10. (1.OA.C.6)
2	Fluently add and subtract within 20 using mental strategies. **By the end of grade 2, know from memory all sums of two single-digit numbers and related differences.** (2.OA.B.2) Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. (2.NBT.B.5)
3	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations. **By the end of grade 3, know from memory all products of two single-digit numbers and related division facts.** (3.OA.C.7) Fluently add and subtract within 1,000 using strategies and algorithm based on place value, properties of operations, and/or the relationship between addition and subtraction. (3.NBT.A.2)
4	Know multiplication facts and related division facts through 12 x 12. (4.OA.A.3) Fluently add and subtract multi-digit whole numbers (within 1,000,000) using the standard algorithm. (4.NBT.B.4)
5	Fluently multiply multi-digit whole numbers. (Include two-digit x four-digit numbers and, three-digit x three-digit numbers) using the standard algorithm. (5.NBT.B.5)

Math fluency is essential. It leads to higher order mathematics, math facts are the building blocks to higher-level math concepts, and knowing math facts also helps to reduce math anxiety. "In recent years brain researchers have found that the students who are most successful with number problems are those who are using different brain pathways," so students learn math facts best through using them in different mathematical situations. (Boaler, 2015). Just as important as daily reading positive gain in reading achievement, daily math practice of 10-15 minutes is necessary in building your child's fact fluency.

Here are ways to build math fluency at home:

- PLAY MATH GAMES: Research has shown that math games help students learn their facts because students receive immediate feedback and repetition with correct answers and games are highly motivating. Play card games and games with dice such as Tens Go Fish, Double Compare, or Close to 100.
- PRACTICE FACTS AS YOU DO EVERYDAY THINGS: Help your child to see math facts in the world around them. "There are 4 red flowers and 3 white flowers in the bouquet. How many flowers do we have?"
- MAKE FLASH CARDS: You don't have to purchase premade sets, students can help make their own. You can also make three-corner flash cards that show the fact family and the relationship between addition & subtraction and multiplication & division. Take it one step further and draw a model or picture of the math fact on the back of the card.

- PUT FACTS IN A VISIBLE PLACE: Post a fact of the week on your refrigerator. Find times during the day to ask your child that fact. Challenge your child by sometimes asking: What fact is on the refrigerator this week?
- BUILD ON WHAT THEY ALREADY KNOW: Your child does not need to memorize hundreds of facts! If he/she knows 3 + 4, then he also knows 4 + 3. If he knows 2 x 6, then help them use it to find 4 x 6 . Talk with your child about the relationship between facts.
- USE A WEBSITE, OR APP: All K-5 CPS students have Symphony Math and FASTT Math accounts. Links to both programs are found on the Cambridge Public School Website. Simply visit www.cpsd.us and select the For Students tab. You will see the following icons in the Student Toolbox.
Symphony Math: Username: Student ID #; Password: abc123
FASTT Math: Username: Student ID #; Password: Abc123@@ (case-sensitive)

Boaler, J. (2015, January 28). Fluency without Fear. Retrieved January 12, 2019, from https://www.youcubed.org/evidence/fluency-without-fear/
Massachusetts Curriculum Frameworks, Mathematics, Grades Pre-Kindergarten to 12, March 2017