



## What does it mean to be fluent with math facts?

### ~ Information for Families and Caregivers ~

#### Children are fluent when they demonstrate:

##### Accuracy

- Correctly solving a problem

##### Flexibility

- The ability to think about a problem in more than one way and to adapt or adjust thinking as necessary

##### Efficiency

- Solving a problem in a reasonable amount of time

**Myth:** Math today is so different.

**Fact:** While the math itself hasn't changed, the focus of math instruction has shifted to ensure students are actively engaged in developing an understanding of the skills and concepts. Representing concepts using models to develop strategies and exercising critical thinking is a much more effective way to build understanding.

**Myth:** Memorization is the best way to master basic facts.

**Fact:** Children may have memorized basic facts, however, they may not have a strategy to solve the particular fact. Memorized facts can be forgotten, but when a strategy is understood, children hang on to it forever.

**Myth:** Children who have memorized the facts won't be challenged.

**Fact:** The goal is not to memorize facts, but to develop a range of strategies to apply to more complex concepts such as multi-digit computations, decimals and fractions. Developing strategies and an understanding of when to use these appropriately, asks children to think at higher levels.

**Myth:** Timed tests help children master facts.

**Fact:** Timed tests do not assess fluency, only accuracy and efficiency. As well, research tells us that timed tests can lead to the development of anxiety around math.

#### Questions to support fact fluency conversations with children

- How did you solve it?
- How do you know it is correct?
- Is there another way you could solve it?
- If someone didn't know the answer to \_\_\_\_, how would you help them to figure it out?
- What strategy can you use to find that fact?
- How is \_\_\_\_ like \_\_\_\_? How are they different? (example: How is  $2 \times 7$  like  $4 \times 7$ ?)

## 熟练掌握数学事实意味着什么？

### ~ 提供给家庭和照顾者的信息 ~

当学生展现出以下能力，代表他们熟练掌握了数学事实：

##### 准确性

- 在没有犯错误的情况下正确解答数学问题

##### 灵活性

- 展示以多种方式解答问题的能力以及根据需要适应或调整思考方式

##### 高效性

- 在合理的时间内解答一个问题

误解：现在的数学很不一样。

事实：虽然数学本身没有变化，但教学的重心已经转变，以确保学生积极参与对技能和概念的理解。使用模型来表示概念以制定方法和进行批判性思考是建立理解的更为有效的办法。

误解：记忆是掌握基本事实的最佳方式。

事实：孩子可能已经记住了基本事实，但可能没有解决特定事实的方法。被记住的事实可能会被遗忘，但当学生能理解一个办法时，孩子们将可以永远记住它。

误解：已记住事实的孩子就不会受到挑战。

事实：目标不是去记住事实，而是制定一系列方法用于更复杂的概念，如多位数计算、小数和分数。制定方法和了解何时适当使用这些方法会要求孩子以更高层次进行思考。

误解：限时测试有助于孩子掌握事实。

事实：限时测试不能评估孩子的熟练性，只能评估准确性和高效性。此外，有研究告诉我们，限时测试可能导致学生对数学产生焦虑。

与孩子讨论数学事实时可以使用的问题：

- 你是怎么解决这个问题的？
- 你怎么知道它是正确的？
- 你还有其他解决方法吗？
- 如果有人不知道 \_\_\_\_ 的答案，你会怎么帮助他们弄清楚？
- 你可以用什么方法找到那个事实？
- \_\_\_\_ 和 \_\_\_\_ 有什么相似之处？它们又有什么不同？（例如： $2 \times 7$  和  $4 \times 7$  有什么相似之处？）



English & <target Language>, Date