Calgary Board of Education

My Child's Path to Number Fact Fluency

Student's Name: _____ Date: _____ Grade: _____

Number fact fluency refers to a student's ability to think **efficiently**, **accurately** and **flexibly** towards mastery using numbers. Students with strong number sense are able to manipulate numbers and understand how to use various strategies to solve problems. Students develop their number fluency along a continuum of learning that starts with basic counting skills and leads to efficient strategies that may include recall through memorization. The following tables identify some of the strategies students use when they are solving number facts mentally. The arrow indicates how students progress as they move towards fluency. A number fact is defined as addition and subtraction expressions up to 20 and multiplication and division expressions up to 144.

Addition and Subtraction Number Fact Assessment

Counting	Flexible Numbers		Mastery
❑ **Subitize** See a set of objects and know how many there are without counting. ❑ **Counting all** Counting each object one at a time.	❑ **Counting on / Counting back** Start with one quantity and count up / down by the second number. ❑ **Skip counting** Counting forwards or backwards by a number other than one. ❑ **Counting on / back from larger number** Start with the larger quantity and count up/down by the other number.	❑ **Using a known fact** Choosing a nearby fact and adjusting. ❑ **Near doubles** - Adjusting the calculation using doubles such as 5 + 7, a student might take 1 from 7 and add it to the 5 to make 6 + 6. ❑ **Using the 5 or 10 anchor** Adding to make 5 or 10 or splitting the number by subtracting to make 5 or 10.	❑ **Recall number facts** Automatically knowing the answer as a result of developing strategies and understanding number relationships.

Multiplication and Division Number Fact Assessment

Counting	Flexible Numbers		Mastery
❑ **Subitize** See a set of objects and know how many there are without counting. ❑ **Counting All** Counting a group of objects multiple times and then count all the objects or counting objects and then separating objects into groups and counting the groups.	❑ **Skip counting** Counting forwards or backwards by a number other than one and tracks how many are counted using fingers or pencil and paper. ❑ **Trial and Error** Draw placeholders for groups and then trial a number of objects in each group.	❑ **Using a repeated addition/ subtraction** Repeatedly applying an operation, such as 20 ÷ 4, a student might start at 20 and subtract 4 mentally until reaching 0 ❑ **Doubling/Halving** Using a double of half and adjusting, such as 7 x 4, a student might double the 7 and then add two more 7's ❑ **Using known facts** Choosing a nearby fact and adjusting	❑ **Recall number facts** Automatically knowing the answer as a result of developing strategies and understanding number relationships.

What are the number facts that students are expected to know?

By the end of Grade 1
- Students learn strategies for addition facts up to and including 10+10 and related subtraction facts
- Students recall addition facts with addends to 10 and related subtraction facts

By the end of Grade 2
- Students recall and apply addition facts with addends to 10 and related subtraction facts

By the end of Grade 3
- Students recall and apply addition facts with addends to 10+10 and related subtraction facts
- Students recall multiplication facts with factors to 10 and related division facts

By the end of Grade 4
- Students recall and apply multiplication facts with factors to 12 and related division facts

Adapted from:

Lawson, A. (2016). What to look for: understanding and developing student thinking in early numeracy. Don Mills, ON: Pearson Canada Inc. ,

A., V. D., Karp, K., Bay-Williams, J. M., & Wray, J. A. (2018). Elementary and middle school mathematics: teaching developmentally (5th ed., Canadian Edition). Don Mills, ON: Pearson.

Alberta Education: https://curriculum.learnalberta.ca/curriculum/en/s/mat