



### Fluency with Arithmetic Operations and Automaticity with Basic Arithmetic Facts

The purpose of this document is to provide educators with an overview of benchmark expectations as it pertains to fluency with arithmetic operations and automaticity with basic arithmetic facts within grades Kindergarten to eight. The table shows how arithmetic operations progress from one grade level to the next and within the stages of fluency (exploration, procedural reliability and procedural fluency). Please note that the tables only includes the Number Sense and Operation (NSO) and Fractions (FR) strands; where noted, some expectations may be found in other strands.

There are two tables, one describing fluency by grade level for addition and subtraction and one describing fluency by grade level for multiplication and division. It is important to refer back to the benchmarks for clarity on specific expectations with fluency for each grade level. Additionally, as you navigate the table, please refer to the key below indicating which stage of fluency is included for the grade level and whether certain stages are embedded within a strand outside of NSO or FR.

<b>Key</b> <i>(Automaticity embedded within Stages 1-3)</i>	
Stage 1: Exploration	Stage 3: Procedural Fluency
Stage 2: Procedural Reliability	Recall Benchmarks
*Procedural reliability stage only within Algebraic Reasoning (AR) strand **Procedural reliability stage only within Measurement (M) strand ***Procedural reliability stage only within Data Analysis and Probability (DP) strand	



Benchmark Expectation for Fluency within Strands		Grade Level								
		K	1	2	3	4	5	6	7	8
Number Sense and Operations (NSO) Addition and Subtraction	Addition of whole numbers from 0 to 10 and subtraction with related facts									
	Add two one-digit numbers with sums from 0 to 10 and subtract using related facts									
	Addition of whole numbers with sums to 20 and subtraction with related facts									
	Addition of whole numbers with sums up to 100 and subtraction with related facts									
	Add and subtract multi-digit whole numbers									
	Add and subtract multi-digit numbers with decimals to hundredths									
	Add and subtract multi-digit numbers with decimals to thousandths									
Fractions (FR) – Addition and Subtraction	Add and subtract fractions with like denominators									
	Addition of two fractions with one denominator of 10 and the other 100									
	Add and subtract fractions with unlike denominators									
NSO Addition and Subtraction	Add and subtract integers									
	Add and subtract rational numbers									
	Add and subtract numbers expressed in scientific notation									



Benchmark Expectation for Fluency within Strands		Grade Level								
		K	1	2	3	4	5	6	7	8
Number Sense and Operations (NSO) Division	Multiplication of whole numbers with products from 0 to 144 and division with related facts									
	Multiply one-digit number by a multiple of 10 or 100									
	Multiplication of two whole numbers, up to three digits by two digits									
	Multiplication of whole numbers, up to two digits									
	Division of whole number, up to four digits, by one-digit whole number									
	Multiply and divide multi-digit whole numbers									
	Multiply and divide multi-digit numbers with decimals to hundredths									
	Multiply and divide multi-digit numbers with decimals to tenths by one-tenth and one-hundredth									
Fractions (FR) – Multiplication and Division	Multiplication of a fraction by a whole number									
	Multiplication of a fraction by a fraction									
	Division of a unit fraction by a whole number and a whole number by unit fraction									
(NSO) Multiplication and Division	Multiply and divide multi-digit numbers with decimals to thousandths									
	Multiply and divide fractions by fractions									
	Multiply and divide integers									
	Multiply and divide rational numbers									
	Add and subtract numbers expressed in scientific notation									