Common Core State Standards, Fluency in Mathematics

Fluency is not meant to come at the expense of understanding but is an outcome of a progression of learning and sufficient thoughtful practice. It is important to provide the conceptual building blocks that develop understanding in tandem with skill along the way to fluency; the roots of this conceptual understanding often extend one or more grades earlier in the standards than the grade when fluency is finally expected. (PARCC MCF, v3.0, p. 12)

Wherever the word *fluently* appears in a content standard, the word means *quickly and accurately*. It means more or less the same as when someone is said to be fluent in a foreign language. To be fluent is to flow: Fluent isn't halting, stumbling, or reversing oneself. A key aspect of fluency in this sense is that it is not something that happens all at once in a single grade but requires attention to student understanding along the way. It is important to ensure that sufficient practice and extra support are provided at each grade to allow all students to meet the standards that call explicitly for fluency. (PARCC MCF, v3.0, p. 9)

Fluency Expectations, K-8

Grade	Standard	Expected Fluency
K	K.OA.A.5	Add/Subtract within 5
1	1.OA.C.6	Add/Subtract within 10
2	2.OA.B.2 2.NBT.B.5	Add/Subtract within 20 (Know single digit sums from memory) Add/Subtract within 100
3	3.OA.C.7 3.NBT.A.2	Multiply/Divide within 100 (Know single digit products from memory) Add/Subtract within 1000
4	4.NBT.B.4	Add/Subtract within 1,000,000
5	5.NBT.B.5	Multi-digit multiplication
6	6.NS.B.2 6.NS.B.3	Multi-digit division Multi-digit decimal operations
7	7.NS.A.1,2 7.EE.B.3 7.EE.B.4	Fluency with rational number arithmetic Solve multistep problems with positive and negative rational numbers in any form Solve one-variable equations of the form $px + q = r$ and $p(x + q) = r$ fluently
8	8.EE.C.7 8.G.C.9	Solve one-variable linear equations, including cases with infinitely many solutions or no solutions Solve problems involving volumes of cones, cylinders, and spheres together with previous geometry work, proportional reasoning and multi-step problem solving in grade 7

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The high school standards do not set explicit expectations for fluency nor will the Partnership for Assessment of Readiness for College and Career (PARCC) assessments address fluency, but fluency is important in high school mathematics. For example, fluency in algebra can help students get past the need to manage computational details so that they can observe structure and patterns in problems. Such fluency can also allow for smooth progress beyond the college and career readiness threshold toward readiness for further study/careers in science, technology, engineering, and mathematics (STEM) fields. Therefore, this section makes recommendations about fluencies that can serve students well as they learn and apply mathematics. These fluencies are highlighted to stress the need for curricula to provide sufficient supports and opportunities for practice to help students gain fluency. Fluency is not meant to come at the expense of understanding; it is an outcome of a progression of learning and thoughtful practice. Curricula must provide the conceptual building blocks that develop in tandem with skill along the way to fluency. (PARCC MCF, v3.0, pp. 41-42)

Fluency Recommendations, High School

Course	Standard	Recommended Fluency
Algebra I	A/G A-APR.A.1 A-SSE.A.1b	Solving characteristic problems involving the analytic geometry of lines Fluency in adding, subtracting, and multiplying polynomials Fluency in transforming expressions and seeing parts of an expression as a single object
Geometry	G-SRT.B.5 G-GPE.B.4, 5, 7 C-CO.D.12	Fluency with the triangle congruence and similarity criteria Fluency with the use of coordinates Fluency with the use of construction tools
Algebra II	A-APR.D.6 A-SSE.A.2 F.IF.A.3	Divide polynomials with remainder by inspection in simple cases See structure in expressions and use this structure to rewrite expressions Fluency in translating between recursive definitions and closed forms