**Common Core Fluencies- K-8**

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| **Grade** | **Required Fluency**  |
| K  | Add/subtract within 5  |
| 1  | Add/subtract within 10  |
| 2  | Add/subtract within 201 Add/subtract within 100 (pencil and paper)  |
| 3  | Multiply/divide within 1002 Add/subtract within 1000  |
| 4  | Add/subtract within 1,000,000  |
| 5  | Multi‐digit multiplication  |
| 6  | Multi‐digit division Multi‐digit decimal operations  |
| 7  | Solve *px* + *q* = *r*, *p*(*x* + *q*) = *r*  |
| 8  | Solve simple 2x 2 systems by inspection  |

*Fluent* in the Standards means “fast and accurate.” It might also help to think of fluency as meaning the same thing as when we say that somebody is fluent in a foreign language: when you’re fluent, you flow. Fluent isn’t halting, stumbling, or reversing oneself. Assessing fluency requires attending to issues of time (and even perhaps rhythm, which could be achieved with technology).

The word *fluency* was used judiciously in the Standards to mark the endpoints of progressions of learning that begin with solid underpinnings and then pass upward through stages of growing maturity. In fact, the rarity of the word itself might easily lead to fluency becoming invisible in the Standards—one more among 25 things in a grade, easily overlooked. Assessing fluency could remedy this, and at the same time allow data collection that could eventually shed light on whether the progressions toward fluency in the Standards are realistic and appropriate.

1 By end of year, know from memory all sums of two one‐digit numbers

2 By end of year, know from memory all products of two one‐digit numbers

**Common Core Fluencies- High School Courses**

These fluency recommendations are listed within the PARCC Frameworks for the High School courses. <http://parcconline.org/parcc-model-content-frameworks>

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| **Algebra 1** | **A/G** Algebra I students become fluent in solving characteristic problems involving the analytic geometry of lines, such as writing down the equation of a line given a point and a slope. Such fluency can support them in solving less routine mathematical problems involving linearity, as well as in modeling linear phenomena (including modeling using systems of linear inequalities in two variables). **A-APR.1** Fluency in adding, subtracting, and multiplying polynomials supports students throughout their work in algebra, as well as in their symbolic work with functions. Manipulation can be more mindful when it is fluent. **A-SSE.1b** Fluency in transforming expressions and chunking (seeing parts of an expression as a single object) is essential in factoring, completing the square, and other mindful algebraic calculations. |
| **Geometry** | **G-SRT.5** Fluency with the triangle congruence and similarity criteria will help students throughout their investigations of triangles, quadrilaterals, circles, parallelism, and trigonometric ratios. These criteria are necessary tools in many geometric modeling tasks. **G-GPE.4, 5, 7** Fluency with the use of coordinates to establish geometric results, calculate length and angle, and use geometric representations as a modeling tool are some of the most valuable tools in mathematics and related fields. **G-CO.12** Fluency with the use of construction tools, physical and computational, helps students draft a model of a geometric phenomenon and can lead to conjectures and proofs. |
| **Algebra II** | **A-APR.6** This standard sets an expectation that students will divide polynomials with remainder by inspection in simple cases. For example, one can view the rational expression. For example, one can view the rational expression $\frac{x+4}{x+3}$ as $\frac{x+4}{x+3}$ = $\frac{\left(x+3\right)+1}{x+3}$ = 1 +$ \frac{1}{x+3}$**A-SSE.2** The ability to see structure in expressions and to use this structure to rewrite expressions is a key skill in everything from advanced factoring (e.g., grouping) to summing series to the rewriting of rational expressions to examine the end behavior of the corresponding rational function. **F-IF.3** Fluency in translating between recursive definitions and closed forms is helpful when dealing with many problems involving sequences and series, with applications ranging from fitting functions to tables to problems in finance. |