Fluency Expectations/Recommendations and Examples of Culminating Standards Kindergarten through Algebra II

Kindergarten • Add and subtract within 5 (K.OA.5) (fluency)	**1st Grade** • Add and subtract within 10 (1.OA.6) (fluency)	**2nd Grade** • Add and subtract within 20 using mental strategies (2.OA.2) (fluency) • Know sums of 2 one-digit numbers by memory (2.OA.2) (fluency) • Add and subtract within 100 (2.NBT.5) (fluency)
3rd Grade • Multiply and divide within 100 (3.OA.7) (fluency) • Know products of two-digit numbers from memory (3.OA.7) (fluency) • Add and subtract within 1000 (3.NBT.2) (fluency)	**4th Grade** • Add and subtract multi-digit whole numbers (4.NBT.4) (fluency) • Add and subtract within 1,000,000 (4.NBT.4) (fluency)	**5th Grade** • Multiply multi-digit whole numbers (5.NBT.5) (fluency)
6th Grade • Divide multi-digit whole numbers (6.NS.2) (fluency/culminating) • Add, subtract, multiply, and divide multi-digit decimals (6.NS.3) (fluency/culminating) • Divide fractions (6.NS.1) (culminating)	**7th Grade** • Add, subtract, multiply, and divide rational numbers (7.NS.1-2) (culminating) • Solve multi-step problems with positive and negative rational numbers (7.EE.3) (culminating) • Solve equations $px+q=r$ and $p(x+q)=r$ (7.EE.4) (culminating)	**8th Grade** • Solutions of one-variable linear equations where coefficients may be rational (8.EE.7) (culminating) • Set of geometric measurement skills (volume of cones, cylinders, and spheres-includes 7th grade work in angle measure, area, surface area and volume) (8.G.9) (culminating)
Algebra I • Analytic geometry of lines (A/G) (fluency recommendation) • Add, subtract, and multiply polynomials (A-APR.1) (fluency recommendation) • Transforming expressions and "chunking" (seeing parts of an expression as a single object) (A-SSE.1b) (fluency recommendation)	**Geometry** • Triangle congruence and similarity criteria (G-SRT.5) (fluency recommendation) • Use coordinates to establish geometric results (G-GPE.4, 5, 7) (fluency recommendation) • Use construction tools (G-CO.12) (fluency recommendation)	**Algebra II** • Divide polynomials with remainders by inspection in simple cases (A-APR.6) (fluency recommendation) • Rewrite expressions (A-SSE.2) (fluency recommendation) • Translate between recursive definitions and closed forms (F-IF.3) (fluency recommendation)

Fluency Expectations/Recommendations and Examples of Culminating Standards Kindergarten through Mathematics III

Kindergarten • Add and subtract within 5 (K.OA.5) (fluency)	**1st Grade** • Add and subtract within 10 (1.OA.6) (fluency)	**2nd Grade** • Add and subtract within 20 using mental strategies (2.OA.2) (fluency) • Know sums of 2 one-digit numbers by memory (2.OA.2) (fluency) • Add and subtract within 100 (2.NBT.5) (fluency)
3rd Grade • Multiply and divide within 100 (3.OA.7) (fluency) • Know products of two-digit numbers from memory (3.OA.7) (fluency) • Add and subtract within 1000 (3.NBT.2) (fluency)	**4th Grade** • Add and subtract multi-digit whole numbers (4.NBT.4) (fluency) • Add and subtract within 1,000,000 (4.NBT.4) (fluency)	**5th Grade** • Multiply multi-digit whole numbers (5.NBT.5) (fluency)
6th Grade • Divide multi-digit whole numbers (6.NS.2) (fluency/culminating) • Add, subtract, multiply, and divide multi-digit decimals (6.NS.3) (fluency/culminating) • Divide fractions (6.NS.1) (culminating)	**7th Grade** • Add, subtract, multiply, and divide rational numbers (7.NS.1-2) (culminating) • Solve multi-step problems with positive and negative rational numbers (7.EE.3) (culminating) • Solve equations px+q=r and p(x+q)=r (7.EE.4) (culminating)	**8th Grade** • Solutions of one-variable linear equations where coefficients may be rational (8.EE.7) (culminating) • Set of geometric measurement skills (volume of cones, cylinders, and spheres-includes 7th grade work in angle measure, area, surface area and volume) (8.G.9) (culminating)
Mathematics I • Analytic geometry of lines (A/G) (fluency recommendation) • Geometric transformations (G) (fluency recommendation) • Create a visual representation of a data set (S) (fluency recommendation)	**Mathematics II** • Graphing functions and interpreting key features of graphs and fitting a data set to a curve (F/S) (fluency recommendation) • Add, subtract, and multiply polynomials (A-APR.1) (fluency recommendation) • Triangle congruence and similarity criteria (G.SRT.5) (fluency recommendation)	**Mathematics III** • See algebraic manipulation as a way to understand the structure of an expression or equation (A/F) (fluency recommendation) • Model real-world situations (M) (fluency recommendation) • Understand quantities and their relationships-use appropriate units (M) (fluency recommendation) • Understand effects of parameter changes and apply them to create a rule modeling the function (F-BF.3) (fluency recommendation)