## Course Name: Grade 8 Algebra Course Codes: M2802, M2807, M2808, M2809

## **Course Description:**

The grades 6, 7, and 8 mathematics curriculum provides the equivalent of a first-year algebra program. The eighth grade mathematics program is an integrated curriculum where concepts are incorporated from numeration, operations, patterns, functions, algebra, geometry, measurement, probability, statistics and discrete mathematics. Units emphasize particular strands, though the strands are connected and integrated throughout the course.

**Course Proficiencies:** The following is a list of the proficiencies that describe what students are expected to know and be able to do as a result of successfully completing this course. The proficiencies are the basis of the assessment of student achievement. The learner will demonstrate the ability to:

- 1. Extend understanding of the number system by constructing meaning of rational and irrational numbers. Determine closure under the operations of addition and multiplication. *8.NS.1, 8.NS.2, N-RN.3*
- Construct the meaning of roots by solving equations of the form x<sup>2</sup>=p and x<sup>3</sup>=p.
  *8.EE.2, A-REI.2*
- 3. Generate equivalent expressions involving integer exponents and radicals. 8.EE.1.
- 4. Solve and graph linear equations in one variable containing absolute value and rational number coefficients. *8.EE.7b, A-REI.2*
- 5. Solve and graph linear inequalities in one variable. *A-REI.3*
- 6. Interpret slope as a rate of change and using similar triangles. 8.EE.5, 8.EE.6
- 7. Create and interpret linear models using words, tables, graphs, and equations. *8.F.2*
- 8. Understand the meaning of a function. Explore domain and range. 8.F.1, F-IF.1
- 9. Graph linear functions using intercepts or a data point and slope. 8.F.4, F-IF.7a
- 10. Describe and distinguish the difference between quadratic, linear, and exponential relationships, given tables, graphs and equations. 8.F.2, 8.F.3, 8.F.5
- 11. Explore properties of quadratics. *F-IF.4*
- 12. Determine the most appropriate method of solving systems of linear equations. *8.EE.8a*, *8.EE.8b*
- 13. Solve real-world problems leading to a systems model. *8.EE.8c*
- 14. Use technology to graph functions and approximate solutions to equations.
- 15. Perform and algebraically represent transformations, translations, reflections, and rotations on the coordinate plane. 8.G.3, G-CO.2, G-CO.3, G-CO.5
- 16. Use angle pairs to explore properties of reflected triangles and quadrilaterals. (linear pairs, vertical angles, and alternate interior angles). Explore congruence.8.G.2, G-CO.9

## Grade 8 Proficiencies - cont'd.

- 17. Explore dilation by enlarging or shrinking polygons on a coordinate grid by multiplying or dividing coordinates. Examine the impact on perimeter and area, using the distance formula. *8.G.3*
- 18. Use formulas for volume of cones, cylinders, and spheres to solve real-world problems. *8.G.9*
- Construct and interpret scatter plots. Explore line of best fit. 8.SP.1, 8.SP.2, 8.SP.3
- 20. Analyze probabilities in real-world situations, including independent and dependent events.
- 21. Use two-way tables to summarize real-world data. 8.SP.4
- 22. Select and interpret appropriate representations for sets of data, including Box and Whisker plots. *S-IC.6*
- 23. Apply techniques of systematic listing, counting, and reasoning in a variety of contexts.
- 24. Apply mathematics in practical situations and in other disciplines.
- 25. Use critical thinking skills to make sense of problems, solve them, and communicate processes. *CRP 2, 4 & 8.*
- 26. Use technology to gather, analyze, and communicate mathematical information. *8.1.8.A.1, 8.1.8.F.1*

**Assessment:** At grade 8, student growth in mathematics is assessed in a variety of ways. These may include teacher observations of individual and small group activities as well as formal evaluations of independent student work. Observation of individual work and independent classroom activities provides on-going information to guide instruction and to quickly provide information to students and parents regarding student progress. Observation of collaborative activities enables the teacher to assess students as they apply skills and abilities through a variety of strategies. Formal evaluations are made using quizzes, chapter tests, projects, and homework. Students will be responsible for maintaining a notebook. The notebook will include students' individual record of performance. Annual progress is measured by using both local assessments and standardized tests.

## **Board Adopted Materials:**

Teaching Resources and Related Materials:

Title: <u>Connected Mathematics 3</u> Developer: Michigan State University Publisher: Pearson Copyright: 2014

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