

## **Course Name: Algebra I**

**Course Code: H2002   Grades 9-10   Level: Academic   Year: 5X   Credits: 5**

**Course Description:** At this level, the focus of Algebra I is the properties and uses of linear equations including graphs and related inequalities. Algebraic symbolism is used to study and explore properties of the real numbers, operations on real numbers, and systems of equations. Related concepts such as quadratic expressions and geometric applications are introduced. There is an emphasis on solving problems using mathematics.

**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**
2. Construct the meaning of roots by solving equations of the form  $x^2=p$  and  $x^3=p$ . **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**

### **Algebra I 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**
19. 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. **8.1.12.A.3, 8.1.12.C.1**

**Assessment:** Evaluation of student achievement in this course will be based on the following:

- A. Tests
  - B. Projects
  - C. Classwork
  - D. Maintaining a folder/notebook
- A. Tests are usually given at the end of a unit. These generally require a full period to complete.
- B. During the course, special projects such as research papers, outlines, surveys, and computer-based projects may be assigned to students. These activities are major in scope. The grades on projects will count as major grades when determining the course grade.
- C. Classwork, evidenced by completed and carefully presented daily work and by the meeting of daily responsibilities, is an essential part of learning. The day-to-day work included as classwork may involve quizzes, the written results of learning activities, graded homework, and assessments of learning observed during class. The more a student is involved, the more learning that takes place.
- D. Folders/Notebooks must be maintained by students. These typically include notes and assignments kept in an organized fashion.

## **Board Adopted Materials:**

Teaching Resources and Related Materials:

Title: **Connected Mathematics 3**

Developer: Michigan State University

Publisher: Pearson

Copyright: 2014