**Challenger Middle School Course Syllabus Course Name: Pre-Algebra Grade: 8**

**Quarter 3 Start Date: February 6, 2023 Quarter 3 End Date: Apr 20, 2023**

**Quarter 4 Start Date: Apr 21, 2023 Quarter 4 End Date: Jun 23, 2023**

**Pre-Algebra**

**District Course Code: Q800MA2**

**CEDARS Course Code:**

**Certificated Teacher: Allison Sampson**

**Grading:** A, B, C, D, F

**Course Description:**

Illustrative math is a problem based curriculum, not to be confused with project based learning, with a core belief that everyone can do math. The focus will be on: Conceptual Understanding, the why behind the how, Procedural Fluency, solving problems with speed, accuracy, and flexibility, and Application, applying math skills to a new mathematical or real world problem.

**Text/Resources Provided:**

Illustrative Mathematics Student Text for each unit and supplies required for each lesson, course materials in class canvas course.

**Online resources:**

 Illustrative Math, Imagine Math, Canvas

**Common Core Standards Addressed In This Course :**

**Quarter 1: N/A**

**Quarter 3/4:**

 **8.G.5** Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

**8.EE.5** Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

**8.EE.6** Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation *y* = *mx* + *b* for a line intercepting the vertical axis at *b*.

[**8.EE.C.7**](http://www.corestandards.org/Math/Content/8/EE/C/7/) **Solve linear equations in one variable.**

[8.EE.C.7.A](http://www.corestandards.org/Math/Content/8/EE/C/7/a/) Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form *x* = *a*, *a* = *a*, or *a* = *b* results (where *a* and *b* are different numbers).

[8.EE.C.7.B](http://www.corestandards.org/Math/Content/8/EE/C/7/b/) Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

[**8.EE.C.8**](http://www.corestandards.org/Math/Content/8/EE/C/8/) **Analyze and solve pairs of simultaneous linear equations.**

[8.EE.C.8.A](http://www.corestandards.org/Math/Content/8/EE/C/8/a/) Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

[8.EE.C.8.B](http://www.corestandards.org/Math/Content/8/EE/C/8/b/) Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection.

[8.EE.C.8.C](http://www.corestandards.org/Math/Content/8/EE/C/8/c/) Solve real-world and mathematical problems leading to two linear equations in two variables.

**6.EE.C.9** Use Variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

**8.F.A** Define, evaluate, and compare functions.

8.F.A.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and corresponding output. Function notation is not required.

8.F.A.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

8.F.A.3 Interpret the equation y=mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.

**8.F.B** Use functions to model relationships between quantities.

8.F.B.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x,y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

8.F.B.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph. Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

**8.G.C** Solve real-world problems and mathematical problems involving volume of cylinders, cones, and spheres.

8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

**8.F.A** Define, evaluate, and compare functions

8.F.A.3 Interpret the equation y=mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.

**8.F.B** Use functions to model relationships between quantities

**6.G.A.1** Find the area of right triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the contest of solving real-world and mathematical problems

**6.G.A.2** Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V=lwh and V=bh to find volumes of right rectangular prisms with fractional edge lengths in the context for solving real-world and mathematical problems.

**6.E.E.A** Apply and extend previous understanding of arithmetic to algebraic expressions.

 6.E.E.A.1 Write and evaluate numerical expressions involving whole -number exponents.

**6.E.E.B.5** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true: Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

**7.G.B.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

**8.NS.A.2** Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions.

8.E.E.A.2 Use square root and cube root symbols to represent solutions to equations of the form $x2^{}$ = p and x3 = p, where p is a positive rational number. Evaluare square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

**Course Objectives:**

To pass and earn credit for this course, the student will demonstrate mastery of these standards through assignments, projects and/or assessments:

**Quarter 3/4:**

**Unit 3**

Lessons 1–4: Proportional Relationships

Lessons 5–8: Representing Linear Relationships

Lessons 9–14: Finding Slopes and Linear Equations

**Unit 4**

Lesson 1: Puzzle Problems

Lessons 2-9: Linear Equations in One Variable

Lessons 10-15: Systems of Linear Equations

Lesson 16: Let's put it to work

**Unit 5**

Lesson 1-2: Inputs and Outputs

Lesson 3-7: Representing and Interpreting Functions

Lesson 8-10: Linear Functions and Rates of Change

Lesson 11-16: Cylinders and Cones

Lesson 17-21: Dimensions and Spheres

**Unit 8**

Lesson 1-5: Side Lengths and Area of Squares

Lesson 6-11: Pythagorean Theorem

Lesson 12-13: Side Lengths and Volume of Cubes

Lesson 14-15: Decimal Representation of Rational and Irrational Numbers

**COURSE GRADE REQUIREMENTS**

**Course Grading Scale:**

**Standards-Based Grading:**

Grading will be standards based. All assignments are expected to be completed to standard; this is a "B". "A" is exceeding standards; demonstrating a deeper and extended understanding of the material. If tests/projects do not meet standard they will need to be revised within the grading period.

**Formative Assessment – 20%:** This includes assignments that assess student learning of a concept and may be a worksheet, team projects, or a quiz.

**Summative** **Assessment- 80% of grade:** Students **CANNOT** pass without passing the assessments. Included are: tests, essays, and projects. Assessments are directly tied to one or more standards.

**Make up/Retake policy**: All tests can be retaken until the student demonstrates mastery of the content. Retake opportunities may require extra preparation.

**Grading Scale: This year we are transitioning to a 4 point standards based scale, similar to what is used in elementary school.**

| **22-23 CHALLENGER MIDDLE STANDARDS-BASED GRADING SCALE** |
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| **SBG SCORE** | **DESCRIPTION** | **LETTER ALIGNMENT** |
| **4** | **Exceeding Standards -** Consistently meets requirements for exceptional work related to course standards and demonstrates a deep level of knowledge and skill | A80-100 |
| **3** | **Meeting Standards -** Consistently meets most requirements for proficient work related to course standards and demonstrates grade level knowledge and skills | B60-80 |
| **2** | **Approaching Standards -** Consistently meets some requirements for proficient work related to course standards and demonstrates some grade level knowledge and skills | C40-60 |
| **1** | **Attempting Standards -** With or without consistent support student is making limited progress towards standards - progress report meeting required | D20-40 |
| **0** | **Insufficient Evidence -** With consistent help, no demonstration of key standards - progress report meeting required | F0-20 |

**Academic Honesty:**

We are here to learn and grow as scholars and as such strive to produce our best original work. We will be exploring the concepts of plagiarism, cheating, and academic integrity throughout our courses.

Progress and course assignment/project completion will be evaluated at least monthly by the teacher.

**Classroom Expectations and Norms:**

If what you are doing: INTERFERES with learning, HURTS someone's heart, PREVENTS you from being your best self… You shouldn’t be doing it!

**Norms:**

* Everyone has the right to be heard.
* Be respectful while still being critical.
* No name calling.
* One person speaks at a time.
* Hold yourself and each other to high standards of excellence at all times.
* Have the humility to recognize that you do not know everything and that everyone can stand to improve.
* Recognize that everyone will start from different bases of knowledge.