**Highline Academy**

**Math Curriculum Overview**

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| Background |
| Over the past two years, Highline has been working to develop our own math curriculum, a cohesive and comprehensive curriculum that intentionally connects standards, instruction, and assessment. We realized that in order to meet the needs of ALL our learners, both reluctant and highly advanced, we were going to have to do the work of writing our own curriculum. We saw that Saxon math was not adequately preparing ALL of our students for rigorous college track math in High school. So over the last two summers, Highline teachers have been hard at work writing math curriculum in grades 5th-8th. Highline’s math curriculum is based off of the Colorado Common Core Standards. These Standards define what a student should know and be able to do at a given grade level. The standards are informed by the highest, most effective models from states across the country and countries around the world, and provide teachers and parents with a common understanding of what students are expected to learn. Consistent standards will provide appropriate benchmarks for all students, regardless of where they live.  These standards define the knowledge and skills students should have within their K-12 education careers so that they will graduate high school able to succeed in entry-level, credit-bearing academic college courses and in workforce training programs. The standards:   * Are aligned with college and work expectations; * Are clear, understandable and consistent; * Include rigorous content and application of knowledge through high-order skills; * Build upon strengths and lessons of current state standards; * Are informed by other top performing countries.   We hope this math curriculum overview will help you understand what your student will be learning this year in math. Please do not hesitate to reach out with any questions you may have. |

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| Year Long Overview for Grade 7 | |
| Key Concepts | |
| Unit 1: Number Sense   * Place positive/negative rational numbers on the number line * Absolute value and distance on number line * Add/Subtract Integers on the number line * Use Property of operation and additive inverse to add/subtract integers * Mixed operations of rational numbers including integers, fraction and decimals * Real-life problems of mixed operations involving rational numbers   Unit 2: Ratio and Proportions   * Proportional Relationships in Real World * Ratio in units and formula * Ratio and Equations * Solve proportion problems contains fractions and percentage   Unit 3: Variable and Solving Equations   * Writing Variables and Expressions * Properties of Operation and Expressions * Solving 2-step equations * Solving Multistep equations * 2-step equations in Real-life   Unit 4: Inequalities   * Writing and Solving Inequalities * Graphing Inequalities * Real-life application of Inequalities   Unit 5: Probabilities   * Intro to Probability * Experimental vs. Theoretical Probabilities * Compound Events * Presenting Outcomes Through Charts/Tables   Unit 6: Statistics   * Intro to Statistics/Sampling * Measurement of Center/Variability * Comparing Two Populations   Unit 7 Reviews   * Review Order of Operations * Review Mixed Operation of fractions, decimals and integers * Review Proportions and Percentage * Review 2-step equations and Inequalities * Review Geometry: area and perimeter of shapes   Unit 8 Two-Dimensional Shape   * Construct geometric shapes * Intro to angles * Complimentary and supplementary angles * Vertical angles * Transversals * Circumference of a circle * Area of a circle * More about circles   Unit 9 - 3D in Real Life   * Surface area – rectangular prisms * Surface area – triangular prisms * Volume - rectangular prisms * Volume - triangular prisms   Unit 10: Bridging 7th and 8th Grade Math   * Power - Numbers * Power – Variables * Square roots | |
| Connections to 6th Grade Math | |
| In 6th grade, students have already exceled their abilities of computing large numbers, fractions and decimals in four operations. Moreover, students also learned how to solve mixed operation problem by applying order of operations. Those abilities will assist students to enhance the concept of number sense in unit one.  For unit two, ratios and proportions, students learned the concept of unit rates in 6th grade and will continue building up the concept to apply in real-life situations. | |
| Connections to 8th Grade Math | |
| In Seventh grade students will about ratios and proportions and finding unit rates, this ties in to 8th grade when we will further explore proportions but more algebraically; through graphs, tables, and equations. They also focus on integers and rational numbers; adding, subtraction integers, adding, subtracting, multiplying and dividing fractions and decimals. This ties in directly with unit one in 8th grade where we further explore rational and irrational numbers. In seventh grade they also focus a great deal on equations, solving basic one, two, and multi-step equations with one variable. Next year in 8th grade we will further explore multi-step equations with more than one variable. We will take those skills and focus more on the algebra side of solving equations and connecting those equations to graphs, word problems, and tables. | |
| Math Practices | |
| 1. Make sense of problems and persevere in solving them.  2. Reason abstractly and quantitatively.  3. Construct viable arguments and critique the reasoning of others.  4. Model with mathematics.  5. Use appropriate tools strategically.  6. Attend to precision.  7. Look for and make use of structure.  8. Look for and express regularity in repeated reasoning. | |
| Priority Benchmarks | **Supporting Benchmarks** |
| Unit 1: Number Sense  7.1.2a Apply understanding of addition and subtraction to add and subtract rational numbers including integers  7.1.2b Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers including integers  7.1.2c Solve real-world and mathematical problems involving the four operations with rational numbers  7.2.2a Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically  Unit 2: Ratio and Proportions  7.1.1a Analyze proportional relationships and use them to solve real-world and mathematical problems  7.1.1d Use proportional relationships to solve multistep ratio and percent problems. (CCSS: 7.RP.3)  7.4.1.a.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. (CCSS: 7.G.1)  Unit 3: Variable and Solving Equations  7.2.2b Prop of op.  Apply properties of operations to calculate with numbers in any form, convert between forms as appropriate, and assess the reasonableness of answers using mental computation and estimation strategies  7.2.2c.2 Algebraic vs Arithmetic  Compare an algebraic solution to an arithmetic solutions, identifying the sequence of the operation used in each approach  7.2.2c. Variable/Expression  Use variables to represent quantities in a real-world or mathematical problems, and construct simple equations and inequalities to solve problems by reasoning about the quantities.  7.2.2.c.1 Word Prob 2-step  Fluently solve word problems leading to equations of the form px+q=r and p(x+q)=r, where p, q, and r are specific rational numbers  unit 4: Inequalities  7.2.2.c.4 Graph Inequality  Graph the solution set of the inequality and interpret it in the context of the problem  7.2.2c.3 Word Prob Inequality  Solve word problems leading to inequalities of the form ps+q>r, where p, q, and r are specific rational numbers  7.2.2a Integer Appl.  Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically  unit 5 Properbilities  7.3.2.c.2  Probability  Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.  7.3.2.c.3  Probability  Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.  7.3.2.d.1  Probability  Explain that the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.  7.3.2.d.2  Probability  Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams.  unit 6 statistics  7.3.1.a.3 Measure of Center/ Variability  Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.  Statistics  7.3.1.a.2  Explain that random sampling tends to produce representative samples and support valid inferences.  Unit 7 Reviews  7.2.2b Prop of op.  Apply properties of operations to calculate with numbers in any form, convert between forms as appropriate, and assess the reasonableness of answers using mental computation and estimation strategies  7.2.2.c.1 Word Prob 2-step  Fluently solve word problems leading to equations of the form px+q=r and p(x+q)=r, where p, q, and r are specific rational numbers  7.2.2c.3 Word Prob Inequality  Solve word problems leading to inequalities of the form ps+q>r, where p, q, and r are specific rational numbers  7.1.2c REAL NUMBER (all)  Solve real-world and mathematical problems involving the four operations with rational numbers  7.2.2a Integer Appl.  Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically  7.4.1.a.1 Drawing - Proportion  Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. (CCSS: 7.G.1)  Unit 8 Two-Dimensional Shapes  7.4.1.a.2 Drawing - Tools  Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. (CCSS: 7.G.2)  7.4.2.c Angles - Equations  Use properties of supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.  7.4.2.a Area/Circumference  State the formulas for the area and circumference of a circle and use them to solve problems.  Unit 9 - 3D in Real Life  7.4.2.d 3-D - Application  Solve real- world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.  unit 10 Bridging 7th and 8th Grade Math  8.1.1.d Apply the properties of integer exponents to generate equivalent numerical expressions.  8.1.1.e 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 | **Unit 2:** Ratio and Proportion  **7.1.1b Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.(CCSS: 7.RP.1)**  **7.1.1c Identify and represent proportional relationships between quantities. (CCSS: 7.RP.2)**  **Unit 6: statistics**  **7.3.1**  **7.3.3**  **Unit 8 Two-Dimensional Shape**  **7.4.1.a**  Draw construct, and describe geometrical figures and describe the relationships between them.  **7.4.1.a.3**  Construct triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.  **7.4.2.b**  Give an informal derivation of the relationship between the circumference and area of a circle.  **Unit 9 - 3D in Real Life**  7.4.1.a.4  Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. |
| Real-World Application | |
| Student will be able to calculate tax, tip, and shopping math. They will also be able to study map, do scale drawing, converting recipe by applying ratio, unit rates and proportions. They will also apply the concepts of negative rational numbers to approach real life problems such as time zone, temperature, credit/debts, etc. Probability will help them to predict outcomes and analysis situations in life. Students will apply the concepts of geometry to design and price their daily materials through useful projects. | |
| Assessments and Grading | |
| Formative: Do nows, classroom activities, homework, clicker quizzes  Summative: Unit Post Test  Interims  In order to gauge student understanding and the efficacy of instruction, students are assessed formally and informally on a near daily basis. Informal assessments, commonly known as formative assessments, are never graded and are used solely to help both teachers, students, and families determine student progress toward mastery of mathematic concepts. Examples of formative assessments include: Do Nows, Ticket Outs, homework assignments, teacher-student conferences, class participation, and teacher observations.  Formal, or summative assessments are used much the same as formative assessments are in that they help teachers, students, and families see where students currently stand in regard to mathematical mastery. A benchmark assessment is given at the culmination of the study of each benchmark. Interim Assessments are given at the end of each unit, and include all benchmarks taught in that unit.  The purpose of any assessment is not to simply assign a grade. Assessments are used first and foremost to track the progress of each student toward mastery of 7th grade math benchmarks. Assessment results are frequently analyzed by teachers to determine which concepts need to be retaught so that mastery can be achieved. Assessment results are also used to improve the delivery and instruction of mathematical concepts. | |