Pentucket Regional School District

Mathematics Curriculum Guide **Grade 6**

Sixth Grade Priority Areas	
Connecting ratio and rate to whole number multiplication and division, and using concepts of ratio and rate to solve problems	Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates.
Completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers	Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.
Writing, interpreting, and using expressions and equations	Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and they use the properties of operations to rewrite expressions in equivalent forms. Students know that the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables, such as tables of quantities that are in equivalent ratios, and they use equations (such as $3x = y$) to describe relationships between quantities.
Developing understanding of statistical thinking	Building on and reinforcing their understanding of number, students begin to develop their ability to think statistically. Students recognize that a data distribution may not have a definite center and that different ways to measure center yield different values. The median measures center in the sense that it is roughly the middle value. The mean measures center in the sense that it is the value that each data point would take on if the total of the data values were redistributed equally, and also in the sense that it is a balance point. Students recognize that a measure of variability (interquartile range) can also be useful for summarizing data because two very different sets of data can have the same mean and median yet be distinguished by their variability. Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected.
Reasoning about geometric shapes and their measurements	Students in grade 6 also build on their work with area in elementary school by reasoning about relationships among shapes to determine area, surface area, and volume. They find areas of right Massachusetts Curriculum Framework for Mathematics 55 triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop, and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in grade 7 by drawing polygons in the coordinate plane.

Mathematical Practice Standards

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. Look for and express regularity in repeated reasoning.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Model with mathematics.

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Content Standards	
Ratios and Proportional Relationships (RP) ● Understand ratio and rate concepts and use ratio and rate reasoning to solve problems.	**The Number System (NS)** ● Apply and extend previous understandings of multiplication and division to divide fractions by fractions. ● Compute fluently with multi-digit numbers and find common factors and multiples. ● Apply and extend previous understandings of numbers to the system of rational numbers.
Expressions and Equations (EE) ● Apply and extend previous understandings of arithmetic to algebraic expressions. ● Reason about and solve one-variable equations and inequalities. ● Represent and analyze quantitative relationships between dependent and independent variables	**Geometry (G)** ● Solve real-world and mathematical problems involving area, surface area, and volume.
Statistics and Probability (SP) ● Develop understanding of statistical variability ● Summarize and describe distributions.	

PRSD Curriculum Tools and Resources - Grade 6

Eureka Module	Concept	Focus Standards	Focus Standard for Mathematical Practice
1	**Ratios and Unit Rates**	Ratios and Proportional Relationships 6.RP.A.1, 6.RP.A.2 6.RP.A.3	MP.1 MP.2 MP.5 MP.6 MP.7
2	**Arithmetic Operations Including Division of Fractions**	The Number System 6.NS.A.1, 6.NS.B.2 6.NS.B.3, 6.NS.B.4	MP.1 MP.2 MP.6 MP.7 MP.8
3	**Rational Numbers**	The Number System 6.NS.C.5, 6.NS.C.6 6.NS.C.7, 6.NS.C.8	MP.2 MP.4 MP.6 MP.7
4	**Expressions and Equations**	Expressions and Equations 6.EE.A.1, 6.EE.A.2, 6.EE.A.3, 6.EE.A.4 6.EE.B.5, 6.EE.B.6 6.EE.B.7, 6.EE.B.8 6.EE.C.9	MP.2 MP.6 MP.7 MP.8
5	**Area, Surface Area, and Volume Problems**	Geometry 6.G.A.1, 6.G.A.2, 6.G.A.3 6.G.A.4	MP.1 MP.3 MP.4 MP.6

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6	**Statistics**	Statistics and Probability 6.SP.A.1, 6.SP.A.2, 6.SP.A.3, 6.SP.B.4 6.SP.B.5	MP.1 MP.2 MP.3 MP.4 MP.6

A Multi-Tiered System of Support for Math (MTSS)

Pentucket's MTSS for Math is an instructional framework that includes universal screening of all students, multiple tiers of instruction and support services, and an integrated data collection and assessment system to inform decisions at each tier of instruction.

Tier 1 Instruction is the general education curriculum that is provided to all students. Math Instruction for Sixth Grade occurs in a 60 minute block with a combination of whole class and flexible small group instruction. The structure and focus of Eureka in 6th Grade takes a markedly different approach and is more aligned with a Middle School model in mind. The mastery of fractions and functions with fractions through the lense of ratios and proportions is the primary concept development. Eureka Math instruction is still comprised of four critical components.

Fluency Practice: Supports student development and provides opportunities to gain confidence and motivation for continued learning.
Concept Development: Addresses new content through discussion and reflection.
Application Problem: Provides students an opportunity to apply their skills and understanding in new ways.
Student Debrief: Students share thinking, draw conclusions, and complete an exit ticket.

Tier 2 and Tier 3 Instruction occurs in the 60 minutes of classroom time with focused flexible groups taught by the general education teachers, special education teachers, and Title 1 teachers but also may occur in additional time, beyond the 60 minutes in small group pull-out sessions. This instruction focuses on specific skills and needs that are behind and likely to hinder progress without focused intervention.

Benchmark assessments are given 3 times per year to help make decisions on which students need which type and level of intervention. Progress Monitoring data is regularly collected on students receiving interventions so school staff can measure its effectiveness and adjust as needed.

The Grade 6 begins to prepare students for Algebra readiness. Mastery of fractions and functions/application related to fractions is a critical concept in this transition. Students who demonstrate high levels of mastery in 6th Grade may become eligible for a Compacted 7-8 math class in the Middle School as a 7th Grader. This is a pathway to the Algebra I HS level class as an 8th Grader.