Grade 7 Mathematics

The Mathematics Curriculum Framework represents the commitment of the Hinsdale School District to the Common Core State Standards and the ideas of Grant Wiggins and Jay McTighe in their principles of *Understanding by Design.* The Mathematics Curriculum Revision Committee (2015-16) believes that this document provides the necessary framework for teachers to develop mathematical units and lessons based on best practices in curriculum, instruction and assessment.

The Common Core State Standards for Mathematics requires that students develop a conceptual understanding of key concepts, procedural skills and fluency and the ability to use their knowledge to solve real world problems. Teachers are expected to develop lessons that meet these requirements by using a variety of instructional techniques and resources to meet individual student needs.

More information about the Common Core State Standards can be found at:

www.corestandards.org

Grade 7 Mathematics

Standard 7.EE: Expressions and Equations
   Use properties of operations to generate equivalent expressions.
   Solve real-life and mathematical problems using numerical and algebraic expressions and
      equations.

21st Century Learning Expectations:
   Hinsdale students will take responsibility for their own learning.
   Hinsdale students will demonstrate responsibility for their actions and choices.
   Hinsdale students will be able to solve problems.

Enduring Understandings:
   Algebra uses letters to represent numbers while following the rules of arithmetic.
   Equations and inequalities combined with reasonableness are used throughout life.
   Expressions can be simplified by applying the order of operations.
   Equations can be solved by applying inverse operations.

Learning Competencies	Essential Questions
Students will be able to • rewrite expressions with rational coefficients in different forms using the four operations to aid in solving a problem. • solve multi-step real-life and mathematical problems with rational numbers in any form. • solve two step equations and inequalities involving rational numbers algebraically and graphically.	• How can equations and inequalities be used to solve real world and mathematical word problems? • How can the order of operations and fundamentals of algebra help to solve problems?

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Standard 7.G: Geometry
   Draw, construct, and describe geometrical figures and describe the relationships between them.
   Solve real-life and mathematical problems involving angle measure, area, surface area, and
      volume.

21st Century Learning Expectations:
   Hinsdale students will take responsibility for their own learning.
   Hinsdale students will demonstrate responsibility for their actions and choices.
   Hinsdale students will be able to solve problems.

Enduring Understandings:
   Geometric principles can be used to solve real life and mathematical problems.
   Geometry is the mathematics of the properties and relationships of points, lines, planes, and
      surfaces in 1, 2 and 3 dimensions.

Learning Competencies	Essential Questions
Students will be able to • solve problems involving the area and circumference of a circle and surface area of three -dimensional objects. • reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, which will lead to gaining familiarity with the relationships between angles formed by intersecting lines. Work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. • solve real-world and mathematical problems involving area, surface area, and volume of two-and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.	• What are the major classifications of angles, polygons and solids? • What is the relationship between 2D and 3D objects?

Grade 7 Mathematics

Standard 7.RP: Ratios and Proportional Relationships
    Analyze proportional relationships and use them to solve real-world and mathematical problems**.**

21st Century Learning Expectations:
    Hinsdale students will take responsibility for their own learning.
    Hinsdale students will demonstrate responsibility for their actions and choices.
    Hinsdale students will be able to solve problems.

Enduring Understandings:
    Ratio and proportions are useful to solve problems.
    A ratio is a comparison of 2 numbers expressed as a fraction in lowest terms.
    Percent can be represented by a ratio with 100 as a denominator.

Learning Competencies	Essential Questions
Students will be able to • compute unit rate using ratios of fractions. • recognize and represent proportional relationships using ratio tables, graphs, equations, and diagrams to show proportionality. • use proportional relationships to solve multistep ratio and percent problems.	• How can ratios and proportions be used to model and solve real world and mathematical problems? • How do you determine a proportional relationship? • How do proportions relate to percent?

Grade 7 Mathematics

Standard 7.SP: Statistics and Probability
Use random sampling to draw inferences about a population.
Draw informal comparative inferences about two populations.
Investigate chance processes and develop, use, and evaluate probability models.

21st Century Learning Expectations:
Hinsdale students will take responsibility for their own learning.
Hinsdale students will demonstrate responsibility for their actions and choices.
Hinsdale students will be able to solve problems.

Enduring Understandings:
Probability is used to predict the likelihood of an event and make decisions.
Key to valuable probability is good data.

Learning Competencies	Essential Questions
Students will be able to • gain information about a population using random samples. • use data from multiple samples of the same size to gauge estimates and predictions. • assess visual overlap of two data distributions with similar variability. • draw inferences about two populations using measures of center and variability of random samples. • understand that the probability of a chance event is between 0 and 1 to express likely and unlikely events. • approximate the probability of a chance event by collecting data and predicting relative frequency. • develop a probability model and use it to find probabilities of events. • find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	• How do you determine which measures of variability should be used to draw informal comparative inferences? • How are lists, tables, tree diagrams or simulation used to find the probability of an event? • How is probability used to predict frequency of an event?

Grade 7 Mathematics

Standard 7.NS: The Number System

Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

21st Century Learning Expectations:

Hinsdale students will take responsibility for their own learning.

Hinsdale students will demonstrate responsibility for their actions and choices.

Hinsdale students will be able to solve problems.

Enduring Understandings:

Rational numbers are used in everyday contexts.

Rational numbers are all numbers that can be written as a fraction including natural numbers, whole numbers and integers.

Learning Competencies	Essential Questions
Students will be able to • add, subtract, multiply and divide rational numbers, and represent on a number line. • utilize long division to convert from rational numbers to decimals.	• How can we solve real-world and mathematical problems involving the four operations with rational numbers? • How do operations with integers compare to operations with rational numbers? • What will happen if you reverse the order of rational numbers when performing any operation?