

## **Grade 4 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](http://www.corestandards.org)

## Grade 4 Mathematics

### Standard 4.OA: Operations and Algebraic Thinking

Use the four operations with whole numbers to solve problems.  
Gain familiarity with factors and multiples.  
Generate and analyze patterns.

### 21<sup>st</sup> Century Learning Expectations

Hinsdale students will be able to solve problems.  
Hinsdale students will communicate through various means.  
Hinsdale students will take responsibility for their own learning.

### Enduring Understandings

Real world problems can be solved using the four operations.  
Patterns are all around us.  
The number system we use is based on ten.

Learning Competencies	Essential Questions
<p><i>Students will be able to</i></p> <ul style="list-style-type: none"><li>• interpret and verbalize multiplication equations involving comparisons.</li><li>• solve word problems using diagrams to set up the equations to make the multiplication or division comparison using a symbol for the unknown.</li><li>• solve multi-step word problems with whole numbers including the four operations.</li><li>• interpret a remainder by rounding up or ignoring it.</li><li>• verbally or visually represent the problems using equations and letters for the unknown.</li><li>• check for reasonableness of their answers using known mathematical strategies.</li><li>• find factor pairs for whole numbers between 1-100 and determine whether it is prime or composite.</li><li>• identify the number or shape that follows a given rule and extend the pattern giving an explanation.</li></ul>	<ul style="list-style-type: none"><li>• How can interpreting remainders increase your understanding of real world problem solving?</li><li>• What kind of patterns will help solve problems?</li><li>• Why is it important to have number systems, especially as numbers get larger?</li></ul>

<b>Grade 4 Mathematics</b>	
<b>Standard 4.NBT: Numbers and Operations in Base Ten</b> Generalize place value understanding for multi-digit whole numbers. Use place value understanding and properties of operations to perform multi-digit arithmetic.	
<b>21<sup>st</sup> Century Learning Expectations</b> Hinsdale students will be able to solve problems. Hinsdale students will communicate through various means. Hinsdale students will take responsibility for their own learning.	
<b>Enduring Understandings:</b> Every number in a multi digit number has a value based on its location. All multi digit numbers can be expressed in different ways.	
<b>Learning Competencies</b>	<b>Essential Questions</b>
<p><i>Students will be able to</i></p> <ul style="list-style-type: none"> <li>• demonstrate their knowledge of place value by using a digit in a column that is 10 times more than the digit to the right.</li> <li>• read and write multi digit numbers using a variety of explanations such as expanded notation and base ten.</li> <li>• compare multi digit numbers using their knowledge of place value and appropriately using these symbols <math>&lt;</math>, <math>&gt;</math>, and <math>=</math>.</li> <li>• round a multi digit number to a specific place value.</li> <li>• add and subtract multi digit numbers using a standard algorithm and explain the process.</li> <li>• multiply multi digit numbers using strategies based on place value and properties of operations.</li> <li>• perform the four standard operations with multi digit numbers and explain the process.</li> </ul>	<ul style="list-style-type: none"> <li>• How does place value support the four operations?</li> <li>• What is the relationship between multiplication and division?</li> <li>• Why is our number system called “base ten?”</li> </ul>

## Grade 4 Mathematics

### Standard 4.NF: Number and Operations--Fractions

Extend understanding of fraction equivalence and ordering.  
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.  
Understand decimal notation for fractions, and compare decimal fractions.

### 21<sup>st</sup> Century Learning Expectations:

Hinsdale students will be able to solve problems.  
Hinsdale students will communicate through various means.  
Hinsdale students will take responsibility for their own learning.

### Enduring Understandings:

Parts of a whole can be represented by multiple equivalent fractions.  
Fractions with the same denominator are multiples of each other.  
Fractions are connected to decimals.  
Adding and subtracting fractions involves joining or removing parts of the whole.

Learning Competencies	Essential Questions
<p><i>Students will be able to</i></p> <ul style="list-style-type: none"><li>• explain and generate models that express equivalent fractions.</li><li>• compare, order, and perform operations with fractions in different forms including mixed fractions and decimals.</li><li>• visually decompose a fraction into a group of fractions with the same denominator by using an equation.</li><li>• create visual representations and equations to solve addition, subtraction and multiplication word problems involving fractions with like denominators.</li><li>• multiply fractions by whole numbers using fraction models.</li><li>• find equivalent fractions with denominators of 10 and 100 by multiplying the numerator and denominator by 10 and solve addition problems using like denominators.</li><li>• write fractions with denominators of 10 or 100 as equivalent decimals and place on number line.</li><li>• compare decimals using correct symbols and explain.</li></ul>	<ul style="list-style-type: none"><li>• How are equivalent forms of fractions used to solve problems?</li><li>• How are addition and multiplication represented by unit fractions?</li><li>• How can you use fractions in real life?</li><li>• When is it helpful to break things into parts?</li><li>• How are models used to show how fractional parts are combined or separated?</li></ul>

## Grade 4 Mathematics

### Standard 4.MD: Measurement and Data

Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

Represent and interpret data.

Geometric measurement: understand concepts of angle and measure angles.

### 21<sup>st</sup> Century Learning Expectations:

Hinsdale students will be able to solve problems.

Hinsdale students will communicate through various means.

Hinsdale students will take responsibility for their own learning.

### Enduring Understandings:

Unit measure is important to understanding a problem.

Line plots are used to interpret data.

Conversion between units of measure involves using multiplication or division.

Learning Competencies	Essential Questions
<p><i>Students will be able to</i></p> <ul style="list-style-type: none"><li>• demonstrate understanding of measurement units including km, m, cm, kg, g, lb, oz, l, ml, hr, min, and sec.</li><li>• convert measurements into larger and smaller units using a 2 column table.</li><li>• solve multi step word problems involving distance, time, volume, mass and money that include converting units.</li><li>• solve real world problems involving area and perimeter using formulas.</li><li>• make and interpret line plots.</li><li>• construct and measure angles with different protractors.</li><li>• understand, measure, and solve addition and subtraction problems involving degree angle measures in real world problems.</li></ul>	<ul style="list-style-type: none"><li>• Why are unit conversions important to solving problems?</li><li>• How do degree angles correspond to fractions of a circle?</li><li>• What types of problems can be solved with measurements?</li><li>• Why do measurements need both numbers and units?</li></ul>

<b>Grade 4 Mathematics</b>	
<b>Standard 4.G: Geometry</b> Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	
<b>21<sup>st</sup> Century Learning Expectations:</b> Hinsdale students will be able to solve problems. Hinsdale students will communicate through various means. Hinsdale students will take responsibility for their own learning.	
<b>Enduring Understandings:</b> Points, lines, and rays are the building blocks of geometric figures. Understanding geometry helps solve problems having to do with design and construction. Geometric figures can be identified by their attributes.	
<b>Learning Competencies</b>	<b>Essential Questions</b>
<p><i>Students will be able to</i></p> <ul style="list-style-type: none"> <li>• draw and identify points, lines, line segments, rays, parallel lines, and perpendicular lines using 2 dimensional figures.</li> <li>• classify two dimensional figures by their attributes.</li> <li>• identify and draw lines of symmetry.</li> </ul>	<ul style="list-style-type: none"> <li>• Why do I need to know about angles and symmetry?</li> <li>• Where can you find angles in the real world?</li> <li>• What shapes are defined by the presence or absence of parallel and perpendicular lines?</li> </ul>