

*This course focuses on solving ratio and rate problems, understanding division of fractions by fractions, using positive and negative numbers, solving problems involving surface area and volume, and writing equations to solve problems.*

**Course Numbers**

* MTH601/ 602 (and MTH601IB/ 602IB)
* MTH6010/6020 (and MTH6010IB/ 6020IB)

**6th Grade Math**

**Harding Middle School**

2018-2019

**Standards-Referenced Grading Basics**

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| **Evidence shows the student can...** | **Topic Score** |
| Demonstrate all learning targets from Level 3 and Level 4 | 4.0 |
| Demonstrate all learning targets from Level 3 with partial success at Level 4 | 3.5 |
| Demonstrate all learning targets from Level 3 | 3.0 |
| Demonstrate some of the Level 3 learning targets | 2.5 |
| Demonstrate all learning targets from Level 2 but none of the learning targets from Level 3 | 2.0 |
| Demonstrate some of the Level 2 learning targets and none of the Level 3 learning targets | 1.5 |
| Demonstrate none of the learning targets from Level 2 or Level 3 | 1.0 |
| Produce no evidence appropriate to the learning targets at any level | 0 |

The teacher designs instructional activities that grow and measure a student’s skills in the elements identified on our topic scales. Each scale features many such skills and knowledges, also called **learning targets**. These are noted on the scale below with letters (A, B, C) and occur at Levels 2 and 3 of the scale. In the grade book, a specific learning activity could be marked as being 3A, meaning that the task measured the A item at Level 3.

When identifying a Topic Score, the teacher looks at all evidence for the topic. The table to the **right** shows which Topic Score is entered based on what the Body of Evidence shows.

Only scores of 4, 3.5, 3, 2.5, 2, 1.5, 1, and 0 can be entered as Topic Scores.

**Guiding Practices of Standards-Referenced Grading**

**1.** A consistent 4-point grading scale will be used.

**2.** Student achievement and behavior will be reported separately.

**3.** Scores will be based on a body of evidence.

**4.** Achievement will be organized by learning topic and converted to a grade at semester’s end.

**5.** Students will have multiple opportunities to demonstrate proficiency.

**6.** Accommodations and modifications will be provided for exceptional learners.

**DMPS Math Guiding Practices**

In Des Moines Public Schools, we will ensure that each student has access to a rigorous math experience that is supported by a balance of *procedural skills and fluency, conceptual understanding*, and *real-world application*.

**Our Beliefs:**

**6th Grade Math Core Overview and Essential Learnings**

In Grade 6, instructional time is focused on four critical areas: (1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers; (3) writing, interpreting, and using expressions and equations; and (4) developing understanding of statistical thinking.

Ratios and Proportional Relationships

* Understand ratio concepts and use ratio reasoning to solve problems

The Number System

* 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

* 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

* Solve real-world and mathematical problems involving area, surface area, and volume

Statistics and Probability

* Develop understanding of statistical variability
* Summarize and describe distribution

Mathematical Practices are general ideas related to being successful at all topics in math, both this year and in years to come. Students are not scored on mathematical practices but instead teachers refer to these practices to build good student skills when approaching math problems.

8 Mathematical 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

**Course Map**

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| **Semester** | **Unit** | **Estimated Duration and Dates** | **Grading Topics** | **Iowa Common Core Standards** |
| **1** | **Unit One:****The Number System** | *6 weeks*Aug 27 – Oct 8 | * Fluently Computes Decimals (yearlong)
 | 6.NS.B.2, 3 |
| * Ratios and Rates
 | 6.RP.A.1, 2, 3, 6.NS.B.4 |
| **Unit Two:****Ratios and Proportional Relationships****(major)** | *8 weeks*Oct 9 – Dec 4 | * Multiplying and Dividing Fractions
 | 6.NS.A.1  |
| * Solving Percents and Fractions, Decimals, and Percents
 | 6.RP.A.3 |
| **Unit Three: Integers** | *3 weeks*Dec 5 – Jan 14 | * Integers
 | 6.NS.C.5, 6, 7, 8, 6.G.A.3 |
| **2** | **Unit Four: Expressions and Equations****(major)** | *8 weeks*Jan 15 – Mar 13 | * Expressions
 | 6.EE.A.1, 2, 3, 4 |
| * Equations
 | 6.EE.B.6, 7 |
| * Functions and Inequalities
 | 6.EE.B.5, 8 |
| **Unit Five: Geometry** | *4 weeks*Mar 25 – Apr 22 | * Surface Area and Volume
 | 6.G.A.1, 2, 4 |
| **Unit Six: Statistics and Probability** | *5 weeks*Apr 23 – May 28 | * Statistical Measures and Displays
 | 6.SP.B.5, 6.SP.A.2, 6.SP.B.4 |

**Online and Homework**

To assist your student with continued learning and extra practice, you may choose to access our textbook online. You will find tutorials, homework practice, and independent learning opportunities available here at [www.aleks.com](http://www.aleks.com) Your student should know their ALEKS log on and password. However, if you need that information from your student’s teacher please email and we will provide it directly to you.

Additionally, your student has a textbook for the year to keep at home. We will suggest pages and problems that correspond with the topic we are working on in class on our Facebook page. This can provide additional practice at home for your student if you choose.

**Testing Information**

**MAP**

Fall Window

*Sep 3 – Oct 4*

Winter Window

*Jan 2 – Jan 31*

Spring Window

*Apr 28 – May 15*

**Unit One: The Number System**

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| **Grading Topic:****Fluently Computes Decimals** |
| **3** |  | ***Students demonstrate they have the ability to:***1. Fluently **divide** multi-digit numbers using the standard algorithm (6.NS.B.2) (procedural)
2. Fluently **add, subtract, multiply**, and **divide** multi-digit decimals using the standard algorithm for each operation. (6.NS.B.3) (procedural)
3. Make sense of problems – **Analyze** errors of multiplication and division of decimals and make sense of solutions through modeling, estimation, and alternate strategies (MP1)

*Analyze – Analyzing Errors* |
| **Learning Goal** |
| **2** |  | ***Students demonstrate they have the ability to:***1. Fluently **multiply** multi-digit numbers using the standard algorithm.
2. Fluently **subtract** multi-digit numbers using the standard algorithm.
3. Fluently **add** multi-digit numbers using the standard algorithm.
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| **Grading Topic:****Ratios and Rates** |
| **3** |  | ***Students demonstrate they have the ability to:***1. Use ratio and rate reasoning to **solve** real-world and mathematical problems (6.RP.A.3) (units per 1) (application)
2. **Create** equivalent fraction representations of ratios (procedural)
3. Model with mathematics – use tables to **model** real-life situations with mathematics and **model** ratio problem situations symbolically (MP4)

*Analysis* |
| **Learning Goal** |
| **2** |  | ***Students demonstrate they have the ability to:***1. **Understand** the concept of a ratio and use ratio language to **describe** a ratio relationship between two quantities (6.RP.A.1)
2. **Understand** the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and **use** rate language in the context of a ratio relationship (6.RP.A.2)
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**Unit Two: Ratio and Proportional Relationships**

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| **Grading Topic: Multiplying and Dividing Fractions** |
| **3** |  | ***Students demonstrate they have the ability to:***1. **Solve** word problems involving multiplication and division of fractions **(6.NS.A.1)** (application)
2. Model with mathematics – use manipulatives to **model** and **understand** everyday problems with fractions. (MP4)

*Analysis* |
| **Learning Goal** |
| **2** |  | ***Students demonstrate they have the ability to:***1. Compute products and quotients of fractions by using the algorithm (6.NS.A.1)
2. Interpret products and quotients of fractions and visual fraction models to represent the problem (6.NS.A.1)
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| **Grading Topic:****Solving Percents and Fractions, Decimals, and Percents** |
| **3** |  | ***Students demonstrate they have the ability to:***1. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
	* **Solve** problems involving finding the whole, given a part and the percent (6.RP.A.3)
	* **Solve** percent problems (6.RP.A.3c)(conceptual understanding and application)
2. Model with mathematics – **model** real-life situations with mathematics and **model** ratio problem situations symbolically.

*Comprehension* |
| **Learning Goal** |
| **2** |  | ***Students demonstrate they have the ability to:***1. Convert between fractions, decimals, and percent
2. **Find** a percent of a quantity as a rate per 100 (6.RP.A.3) (Include percents over 100
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**Unit Three: Integers**

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| **Grading Topic:****Integers** |
| **3** |  | ***Students demonstrate they have the ability to:***1. **Understand** ordering and absolute value of rational numbers (6.NS.C.7) (conceptual understanding)
2. **Solve** real-world and mathematical problems by **graphing** points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to **find** distances between points with the same first coordinate or the same second coordinate. (6.NS.C.8) (application)
3. Model with mathematics – **describe** a real-world scenario with number lines, coordinate grids, and interpret the results. (MP4)

*Analysis* |
| **Learning Goal** |
| **2** |  | ***Students demonstrate they have the ability to:***1. **Understand** that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to **represent** quantities in real-world contexts, **explaining** the meaning of 0 in each situation (6.NS.C.5)
2. **Understand** a rational number as a point on the number line. **Extend** number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. (6.NS.C.6)
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**Unit Four: Expressions and Equations**

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| **Grading Topic:****Expressions** |
| **3** |  | ***Students demonstrate they have the ability to:***1. **Evaluate** expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. **Perform** arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order(6.EE.A.2c) (procedural)
2. **Apply** the properties of operations to generate equivalent expressions (6.EE.A.3) (procedural)
3. Reason abstractly and quantitatively – **decontextualize** to manipulate symbolic representations by applying properties of operations. (MP2)

*Comprehension* |
| **Learning Goal** |
| **2** |  | ***Students demonstrate they have the ability to:***1. **Write** and **evaluate** numerical expressions involving whole number exponents (6.EE.A.1)
2. **Write** expressions that record operations with numbers and with letters (6.EE.A.2)
3. **Identify** parts of an expression using mathematical terms (6.EE.A.2)
4. **Identify** when two expressions are equivalent (6.EE.A.4)
5. Use distributive property to **solve**. Example: 4 x 38 = (4 x 30) + (4 x 8)
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| **Grading Topic:****Equations** |
| **3** |  | ***Students demonstrate they have the ability to:***1. **Solve** real-world and mathematical problems by writing and solving equations of the form *x* + *p* = *q* and *px* = *q* for cases in which *p*, *q* and *x* are all nonnegative rational numbers (6.EE.B.7) (application)
2. Model with mathematics – **write** expressions, equations, or inequalities from real-world contexts and **connect** symbolic and graphical representations. (MP4)

*Analysis* |
| **2** |  | ***Students demonstrate they have the ability to:***1. Use variables to **represent** numbers and write expressions when solving a real-world or mathematical problem; **understand** that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set (6.EE.B.6)
2. **Solve** one-step equations (6.EE.B.7)
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| **Grading Topic:****Functions and Inequalities** |
| **3** |  | ***Students demonstrate they have the ability to:***1. **Write** an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. (6.EE.B.8) (application)
2. **Evaluate** expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations using order of operations. (procedural)
3. 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. (6.EE.C.9) (application)
4. Model with mathematics – **write** expressions, equations, or inequalities from real-world contexts and **connect** symbolic and graphical representations. Students use number lines to **compare** numbers and **represent** inequalities. (MP4)

*Analysis* |
| **Learning Goal** |
| **2** |  | ***Students demonstrate they have the ability to:***1. Use substitution to **determine** whether a given number makes an equation or inequality true (6.EE.B.5)
2. **Recognize** that inequalities of the form x > c or x < c have infinitely many solutions**; Represent** solutions of inequalities on number line diagrams (6.EE.B.8)
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**Unit Five: Geometry**

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| **Grading Topic:****Surface Area and Volume** |
| **3** |  | ***Students demonstrate they have the ability to:***1. **Represent** three–dimensional figures using nets made up of rectangles and triangles, and use the nets to **find** the surface area of these figures. **Apply** these techniques in the context of **solving** real–world and mathematical problems. (6.G.A.4) (application)
2. **Solve** real-world and mathematical problems involving the volume of right rectangular prisms with fractional edge lengths applying the formulas V=l\*w\*h and V=B\*h. (6.G.A.2) (application)
3. **Solve** real-world problems involving area of polygons composed of triangles and quadrilaterals. (6.G.A.1) (application)
4. Model with mathematics – **apply** what they learn about area, surface area, and volume to real-world and mathematical problems. (MP4)

*Analysis* |
| **Learning Goal** |
| **2** |  | ***Students demonstrate they have the ability to:***1. **Calculate** the area of triangles, quadrilaterals, and polygons composed of triangles and quadrilaterals (6.G.A.1)
2. **Represent** three-dimensional figures using nets made up of rectangles and triangles (6.G.A.4)
3. **Calculate** the volume of a right rectangular prism with fractional edge lengths
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**Unit Six: Statistics and Probability**

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| **Grading Topic:****Statistical Measures and Displays** |
| **3** |  | ***Students demonstrate they have the ability to:***1. **Relate** choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered (6.SP.B.5d) (conceptual understanding)
2. **Calculate** interquartile range and mean absolute deviation (6.SP.B.5c) (procedural)
3. **Display** numerical data in plots on a number line, including dot plots, histograms, and box plots (6.SP.B.4) (procedural)
4. Model with mathematics – use measures of center and variability and data displays to **draw** inferences and **make** comparisons between data sets. (MP4)

*Analysis* |
| **Learning Goal** |
| **2** |  | ***Students demonstrate they have the ability to:***1. **Describe** the nature of the attribute under investigation, including how it was measured and its units of measurement (6.SP.B.5b)
2. **Calculate** quantitative measures of center median, mean, mode, range (6.SP.B.5c)
3. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. (6.SP.A.2)
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