

Mathematics (6)

Mathematics

Grade(s) 6th, Duration 1 Year, 1 Credit
Required Course

Course Overview

In Grade 6, instructional time will focus 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
- (4) developing understanding of statistical thinking

Mathematics (grade 6) courses typically emphasize skills in numerical operations (including basic operations and their proper order); measurement; patterns; simple functions; geometry; and concepts of data analysis, including statistics and probability.

In addition, students will also build on their work with area in elementary school by reasoning about relationships among shapes to determine area, surface area, and volume.

Timeframe	Unit	Scope And Sequence Instructional Topics
25 Day(s)	Ratios and Proportional Relationships	1. Ratios and Rates 2. Fractions, Decimals, and Percents
42 Day(s)	Expressions and Equations	1. Expressions 2. Equations 3. Functions and Inequalities
40 Day(s)	The Number System	1. Compute with Multi-Digit Numbers 2. Multiply and Divide Fractions 3. Integers and the Coordinate Plane
27 Day(s)	Geometry	1. Area 2. Volume and Surface Area
22 Day(s)	Statistics and Probability	1. Statistical Measures 2. Statistical Displays

Materials and Resources

- Glencoe McGraw-Hill Math Connects Course 1 CCSS
- www.connected.mcgraw-hill.com
- Study Island
- Do The Math: Marilyn Burns supplemental materials
- Internet resources including Futures Channel (futureschannel.com), Sheppard's Software (sheppardssoftware.com), Promethean Planet (prometheanplanet.com), Project Based Learning (pbl-online.org), and National Library of Virtual Manipulatives (nlvm.usu.edu)
- Brain Pop
- Khan Academy
- Common Core Standards and Strategies Flip Chart: Mentoring Minds

Prerequisites

Successful completion of 5th grade math

Course Details

Unit: Ratios and Proportional Relationships

Duration: 25 Day(s)

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Unit Overview

The unit focuses on the Ratios and Proportional Relationships domain. The students will understand ratio concepts and use ratio reasoning to solve problems.

Materials and Resources

Math Connects Course 1: Student Workbook Volumes 1 and 2
Online resources

Academic Vocabulary

coordinate plane
equivalent ratio
graph
greatest common factor
least common multiple
ordered pair
origin
prime factorization
rate
ratio
ratio table
scaling
unit price
unit rate
x-axis
x-coordinate
y-axis
y-coordinate
least common denominator
percent
percent proportion
proportion
rational number

Summative Assessment

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Project with rubric

Topic: Ratios and Rates

Duration: 12 Day(s)

Topic Overview

Students will understand ratio concepts and use ratio reasoning to solve problems.

Learning Targets

Factors and Multiples

Students will find the greatest common factor and least common multiple.

Ratios

Students will express ratios and rates as fractions.

Rates

Students will determine unit rates.

Ratio Tables

Students will use ratio tables to represent and solve problems involving equivalent ratios.

Graph Ratio Tables

Students will graph ordered pairs in ratio tables to solve problems.

Equivalent Ratios

Students will determine if two ratios are equivalent.

Ratio and Rate Problems

Students will solve problems using ratios and rates.

Topic: Fractions, Decimals, and Percents

Duration: 13 Day(s)

Topic Overview

Students will understand ratio concepts and use ratio reasoning to solve problems.

Learning Targets

Decimals and Fractions

Students will write decimals as fractions or mixed numbers and vice versa.

Percents and Fractions

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Students will write percents as fractions and vice versa.

Percents and Decimals

Students will write percents as decimals and decimals as percents.

Percents Greater than 100% and Percents Less Than 1%

Students will write percents greater than 100% and percents less than 1% as fractions and as decimals, and vice versa.

Compare and Order Fractions, Decimals, and Percents

Students will compare and order fractions, decimals, and percents.

Estimate with Percents

Students will estimate the percent of a number.

Percent of a Number

Students will find the percent of a number.

Solve Percent Problems.

Students will solve percent problems involving finding the whole or part.

Unit: Expressions and Equations

Duration: 42 Day(s)

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Required Course

Unit Overview

The unit focuses on the Expressions and Equations domain. The students will apply and extend previous understandings of arithmetic to algebraic expressions.

Materials and Resources

Math Connects Course 1:
Student workbook, volumes 1 & 2
Online resources

Academic Vocabulary

Ch. 6
algebra
algebraic expression
Associative Properties
base
coefficient
Commutative Properties
constant
defining the variable
Distributive Property
equivalent expressions
evaluate
exponent
factor the expression
Identity Properties
like terms
numerical expression
perfect square
powers
properties
term
variable
Ch.7
Addition Property of Equality
Division Property of Equality
equals sign
equation
expressions
inverse operations
Multiplication Property of Equality
solution
solve
Subtraction Property of Equality
Ch.8
arithmetic sequence
dependent variable
function
function table
geometric sequence
independent variable
inequality
linear function
sequence
term

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Topic: Expressions

Duration: 13 Day(s)

Topic Overview

Students will apply and extend previous understandings of arithmetic to algebraic expressions. Students will reason about and solve one-variable equations and inequalities.

Learning Targets

Powers and Exponents

Students will represent numbers using exponents.

Numerical Expressions

Students will find the value of expressions using the order of operations.

Algebra Variables and Expressions

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Students will find the value of expressions using the order of operations.

Algebra: Write Expressions

Students will write verbal phrases as simple algebraic expressions.

Algebra: Properties

Students will use properties to simplify expressions.

The Distributive Property

Students will use the Distributive Property to compute multiplication problems mentally and to rewrite algebraic expressions.

Equivalent Expressions

Students will use properties to simplify expressions.

Topic: Equations

Duration: 12 Day(s)

Topic Overview

Students will apply and extend previous understandings of arithmetic to algebraic expressions. Students will reason about and solve one-variable equations and inequalities.

Learning Targets

Equations

Students will solve equations by using mental math and the guess, check, and revise strategy.

Solve and Write Addition Equations

Students will solve and write addition equations.

Solve and Write Subtraction Equations

Students will solve and write subtraction equations.

Solve and Write Multiplication Equations

Students will solve and write multiplication equations.

Solve and Write Division Equations

Students will solve and write division equations.

Topic: Functions and Inequalities

Duration: 12 Day(s)

Topic Overview

Students will apply and extend previous understandings of arithmetic to algebraic expressions. Students will reason about and solve one-variable equations and inequalities.

Learning Targets

Function Tables

Students will complete function tables and find function rules.

Function Rules

Students will extend and describe arithmetic sequences using algebraic expressions.

Functions and Equations

Students will construct and analyze different verbal, tabular, graphical, and algebraic representations of functions.

Multiple Representations of Functions

Students will construct and analyze different verbal, tabular, graphical, and algebraic representations of functions.

Inequalities

Students will solve inequalities by using mental math and the guess, check, and revise strategy.

Write and Graph Inequalities

Students will write and graph inequalities.

Solve One-Step Inequalities

Students will solve one-step linear inequalities.

Unit: The Number System

Duration: 40 Day(s)

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Unit Overview

The unit focuses on the Number System domain. The students will apply and extend previous understandings of multiplication and division to divide fractions by fractions. Students will compute fluently with multi-digit numbers and find common factors and multiples. Students will also apply and extend previous understandings of numbers to the system of rational numbers.

Materials and Resources

Math Connects Course 1: Student Workbook Volumes 1 and 2
Online resources

Academic Vocabulary

compatible numbers
Commutative Property
dimensional analysis
reciprocals
unit ratio
absolute value
bar notation
integer
negative integer
opposites
positive integer
quadrants
rational number
repeating decimal
terminating decimal

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Topic: Compute with Multi-Digit Numbers

Duration: 11 Day(s)

Topic Overview

Students will apply and extend previous understandings of multiplication and division to divide fractions by fractions. Students will compute fluently with multi-digit numbers and find common factors and multiples. Students will apply and extend previous understandings of numbers to the system of rational numbers.

Learning Targets

Add and Subtract Decimals

Students will add and subtract decimals.

Estimate Products

Students will estimate the product of decimals and judge the reasonableness of the results.

Multiply Decimals by Whole Numbers

Students will estimate and find products of decimals and whole numbers.

Multiply Decimals by Decimals

Students will multiply decimals by decimals.

Divide Multi-Digit Numbers

Students will find quotients of problems involving multi-digit divisors.

Estimate Quotients

Students will estimate the quotients of decimals and judge the reasonableness of the results.

Divide Decimals by Whole Numbers

Students will divide decimals by whole numbers.

Divide Decimals by Decimals

Students will divide decimals by decimals.

Topic: Multiply and Divide Fractions

Duration: 12 Day(s)

Topic Overview

Students will apply and extend previous understandings of multiplication and division to divide fractions by fractions. Students will compute fluently with multi-digit numbers and find common factors and multiples. Students will apply and extend previous understandings of numbers to the system of rational numbers.

Learning Targets

Estimate Products of Fractions

Students will estimate products of fractions.

Multiply Fractions and Whole Numbers

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Required Course

Students will multiply fractions and whole numbers.

Multiply Fractions

Students will multiply fractions.

Multiply Mixed Numbers

Students will multiply mixed numbers.

Convert Measurement Units

Students will change units of measure in the customary system.

Divide Whole Numbers by Fractions

Students will divide whole numbers by fractions.

Divide Fractions

Students will divide fractions

Divide Mixed Numbers

Students will divide mixed numbers.

Topic: Integers and the Coordinate Plane

Duration: 13 Day(s)

Topic Overview

Students will apply and extend previous understandings of multiplication and division to divide fractions by fractions. Students will compute fluently with multi-digit numbers and find common factors and multiples. Students will apply and extend previous understandings of numbers to the system of rational numbers.

Learning Targets

Integers and Graphing

Students will use integers to represent real-world situations.

Absolute Value

Students will find the absolute value of an integer.

Compare and Order Integers

Students will compare and order integers.

Terminating and Repeating Decimals

Students will express positive and negative fractions as decimals.

Compare and Order Rational Numbers

Students will compare and order rational numbers.

The Coordinate Plane

Students will locate ordered pairs.

Graph on the Coordinate Plane

Students will graph ordered pairs.

Unit: Geometry

Duration: 27 Day(s)

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Unit Overview

The unit focuses on the Geometry domain. The students will solve real-world and mathematical problems involving area, surface area, and volume.

Materials and Resources

Math Connects Course 1:
Student workbook, volumes 1 & 2
Online resources

Academic Vocabulary

base
composite figure
congruent
formula
height
parallelogram
polygon
rhombus
base
cubic units
lateral face
prism
pyramid
rectangular prism
slant height
surface area
three-dimensional figure
triangular prism
vertex
volume

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Topic: Area

Duration: 14 Day(s)

Topic Overview

Students will solve real-world and mathematical problems involving area, surface area, and volume.

Learning Targets

Area of Parallelograms

Students will find the areas and missing dimensions of parallelograms.

Area of Triangles

Students will find the areas and missing dimensions of triangles.

Area of Trapezoids

Students will find the areas of trapezoids.

Changes in Dimensions

Students will determine effects of changing dimensions on perimeter and area.

Polygons on the Coordinate Plane

Students will draw polygons in the coordinate plane and use coordinates to find length.

Area of Composite Figures

Students will find the areas of composite figures.

Topic: Volume and Surface Area

Duration: 13 Day(s)

Topic Overview

Students will solve real-world and mathematical problems involving area, surface area, and volume.

Learning Targets

Volume of Rectangular Prisms

Students will find the volume of rectangular prisms.

Volume of Triangular Prisms

Students will find the volume of triangular prisms.

Surface Area of Triangular Prisms

Students will find the surface area of triangular prisms.

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Required Course

Surface Area of Pyramids

Students will find the surface area of pyramids.

Unit: Statistics and Probability

Duration: 22 Day(s)

Unit Overview

The unit focuses on the Statistics and Probability domain. The students will develop understanding of statistical variability and summarize and describe distributions.

Materials and Resources

Math Connects Course 1:
Student workbook, volumes 1 & 2
Online resources

Academic Vocabulary

average
first quartile
interquartile range
mean
mean absolute deviation
measure of center
measures of variation
median
mode
outliers
quartiles
range
statistical question
third quartile
box plot
cluster
distribution
dot plot
frequency distribution
gap
histogram
line graph
line plot
peak
symmetric

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Topic: Statistical Measures

Duration: 10 Day(s)

Topic Overview

Students will develop understanding of statistical variability.
Students will summarize and describe distributions.

Learning Targets

Statistical Questions and Mean

Students will find the mean of a data set.

Median and Mode

Students will find and interpret the median and mode of a set of data.

Problem Solving Investigation: Use Logical Reasoning

Students will use logical reasoning to solve problems.

Measures of Variation

Students find the measures of variation.

Mean Absolute Deviation

Students find and interpret the mean absolute deviation for a data set.

Appropriate Measures

Students will choose an appropriate measure of central tendency.

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Topic: Statistical Displays

Duration: 12 Day(s)

Topic Overview

Students will develop understanding of statistical variability.
Students will summarize and describe distributions.

Learning Targets

Line Plot

Students will construct and analyze line plots.

Histograms

Students will construct and analyze histograms.

Box Plots

Students will display and interpret data in box plots.

Shape of Data Distributions

Students describe a data distribution by its center, spread, and overall shape.

Interpret Line Graphs

Students will draw and interpret line graphs.

Select an Appropriate Display

Students will select an appropriate display for a set of data.
