

Mathematics (5)

Mathematics

Grade(s) 5th, Duration 1 Year
Required Course

Course Overview

Students will master concepts of operations/algebraic thinking, number and operations in base ten with whole numbers and fractions, measurement/data, and geometry.

Mathematics (grade 5) courses typically emphasize number, operation, and quantitative reasoning; patterns, relationships, and algebraic thinking; geometry and spatial reasoning; and measurement. Course content may include activities that help students increase operational fluency, make connections between abstract symbols and concrete events or concepts, or present their mathematical reasoning.

Timeframe	Unit	Scope And Sequence Instructional Topics
50 Day(s)	Number and Operations in Base Ten	1. Place value 2. Multiplying Whole Numbers 3. Divide by 1-digit divisors 4. Divide using 2-digit divisors 5. Add and Subtract Decimals 6. Multiplying and Dividing Decimals 7. Expressions and Patterns
20 Day(s)	Operations and Algebraic Thinking	1. Write and interpret numerical expressions, analyze patterns
45 Day(s)	Number and Operations: Fractions	1. Fraction Concepts and Decimal Equivalency 2. Adding and Subtracting Fractions 3. Multiplying and Dividing Fractions
20 Day(s)	Measurement	1. Measurement
15 Day(s)	Geometry	1. Two- and three-dimensional figures 2. Volume

Materials and Resources

- Do The Math: Marilyn Burns supplemental materials
- Internet resources including Promethean Planet (prometheanplanet.com), Project Based Learning (pbl-online.org), and National Library of Virtual Manipulatives (nlvm.usu.edu), IXL, Brain Pop, Khan Academy
- Common Core Standards and Strategies Flip Chart: Mentoring Minds
- KUTA software
- Various former math series resources
- Macmillan McGraw-Hill Math Connects Grade 5

Prerequisites

Successful completion of fourth grade math.

Course Details

Unit: Number and Operations in Base Ten

Duration: 50 Day(s)

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Unit Overview

Students will understand the place value system and perform operations with multi-digit whole numbers and with decimals to the thousandths place.

Materials and Resources

- McGraw-Hill My Math textbook
- Base Ten Blocks and mats
- Division Day
- Do The Math: Marilyn Burns supplemental materials
- Internet resources including Promethean Planet (prometheanplanet.com), Project Based Learning (pbl-online.org), and National Library of Virtual Manipulatives (nlvm.usu.edu), IXL, Brain Pop, Khan Academy
- Common Core Standards and Strategies Flip Chart: Mentoring Minds

Academic Vocabulary

- estimating
- comparing
- ordering
- place
- value
- decimal
- whole number
- expanded form
- standard form
- written form
- short word form
- equation
- equality
- product
- quotient
- sum
- dividend
- divisor
- addend
- difference
- base ten
- tenths
- hundredths
- thousandths
- remainder

Summative Assessment

Chapter Test provided by McGraw-Hill My Math

Topic: Place value

Duration: 10 Day(s)

Topic Overview

Students will learn place value for whole numbers and decimals.

Learning Targets

Place value through millions.

Read and write whole numbers through the millions.

Compare and order whole numbers through millions.

Compare and order whole numbers through millions.

Hands on: Model Fractions and Decimals

Use models to relate decimals to fractions.

Represent Decimals

Represent fractions that name tenths, hundredths, and thousandths as decimals.

Hand On: Understand Place Value

Understand place value in decimal numbers.

Place Value through Thousandths

Read and write decimals in standard form, expanded form, and word form.

Compare Decimals

Compare decimals.

Order Whole Numbers and Decimals

Order Whole Numbers and Decimals

Problem Solving Investigation: Use the four step plan.

Solving problems using the four step plan.

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Topic: Multiplying Whole Numbers

Duration: 10 Day(s)

Topic Overview

Students will multiply whole numbers fluently and accurately.

Learning Targets

Prime Factorization

Find the prime factorization of numbers.

Hands On: Prime Factorization Patterns

Explore patterns in prime factorization.

Powers and Exponents

Use powers and exponents in expressions.

Multiplication Patterns

Use basic facts and patterns to multiply multiples of ten, one hundred, and one thousand mentally.

Problem Solving Investigation: Make a Table

Make a table to solve problems

Hands On: Use Partial Products and the Distributive Property

Explore multiplication by using area models.

The Distributive Property

Use the distributive property to multiply mentally.

Estimate Products

Estimate products by using rounding and compatible numbers.

Multiply by One Digit Numbers

Multiply up to a three digit number by a one digit number.

Multiply by Two Digit Numbers.

Multiply up to a three digit number by a two digit number.

Topic: Divide by 1-digit divisors

Duration: 5 Day(s)

Topic Overview

Students will divide numbers with single-digit divisors fluently and accurately.

Learning Targets

Relate Division to Multiplication

Understand how division and multiplication are related.

Hands On: Division Models

Explore division using models.

Two Digit Dividends

Carry out division with and without remainders.

Division Patterns

Use basic facts and patterns to divide multiples of ten, one hundred, and one thousand mentally.

Estimate quotients

Estimate quotients by using rounding and compatible numbers

Hands on: Division models with greater numbers

Explore division with greater numbers using models

Hands on: Distributive property and partial quotients

Divide using the distributive property and partial quotient

Divide three and four digit dividends

Divide up to a four-digit number by a one-digit number

Place the first digit

Understand how to place the first digit in a quotient

Quotients with zeros

Solve division problems that result in quotients that have zeros

Hands on: Use models to interpret the remainder

Explore how to interpret the remainder in a division problem

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Interpret the remainder

Interpret the remainder in a division problem

Problem solving investigation: Determine extra or missing information

Identify extra information or missing information needed to solve a problem

Topic: Divide using 2-digit divisors

Duration: 5 Day(s)

Topic Overview

Students will divide numbers using two-digit divisors fluently and accurately.

Learning Targets

Estimate quotients

Estimate quotients with two-digit divisors

Hands on: Divide using Base Ten blocks

Explore dividing by two-digit divisors using models

Divide by a two-digit divisor

Divide up to a three-digit number by a two-digit divisor

Adjust quotients

Adjust the quotient when the estimated digit is too high or too low

Divide greater numbers

Divide greater numbers by multi-digit divisors

Problem solving investigation: Solve a simpler problem

Solve problems by solving a simpler problem

Topic: Add and Subtract Decimals

Duration: 10 Day(s)

Topic Overview

Students will add and subtract decimals correctly.

Learning Targets

Round decimals

Round decimals

Estimate sums and differences

Estimate sums and differences by rounding

Problem solving investigation: Estimate or exact answer

Solve problems by using an estimate or an exact answer

Hands on: add decimals using base ten blocks

Explore adding decimals using base ten blocks

Hands on: add decimals using models

Explore adding decimals using models

Add decimals

Add decimals

Addition Properties

Use the associative, commutative, and identity properties to add whole numbers and decimals mentally

Hands on: subtract decimals using base ten blocks

Explore subtracting decimals using base ten blocks

Hands on: Subtract decimals using models

Explore subtracting decimals using models

Subtract decimals

Subtract decimals

Topic: Multiplying and Dividing Decimals

Duration: 5 Day(s)

Topic Overview

Students will correctly multiply and divide numbers containing decimals.

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Required Course

Learning Targets

Estimate products of whole numbers and decimals

Estimate products of whole numbers and decimals

Hands on: use models to multiply

Explore multiplying decimals by whole numbers

Multiply decimals by whole numbers

Multiply decimals by whole numbers

Hands on: use models to multiply decimals

Explore using decimal models to multiply decimals

Multiply decimals

Multiply decimals by decimals

Multiply decimals by powers of ten

multiply decimals by powers of ten

Problem solving investigation: look for a pattern

Solve problems by looking for a pattern

Multiplication properties

Use the associative, commutative, and identity properties to multiply mentally

Estimate quotients

Estimate quotients of decimals and whole numbers

Hands on: Divide decimals

Explore dividing decimals by whole numbers

Divide decimals by whole numbers

Divide decimals by whole numbers

Hands on: use models to divide decimals

Explore using models to divide decimals by decimals

Divide decimals

Divide decimals by decimals

Divide decimals by powers of ten

Divide decimals by powers of ten

Topic: Expressions and Patterns

Duration: 5 Day(s)

Topic Overview

Numerical Expressions, Order of Operations, Patterns and Coordinate Grids.

Learning Targets

Hands On: Numerical Expressions

Write and evaluate numerical expressions.

Order of Operations

Use the order of operations to evaluate expressions.

Write Numerical Expressions

Use numbers and operations symbols to write verbal phrases as numerical expressions.

Problem Solving Investigation: Work Backward

Solve problems by working backward.

Hands On: Generate Patterns

Generate numerical patterns and identify pattern relationships.

Patterns

Identify and extend patterns and sequences.

Hands On: Map Locations

Plot points on a grid to solve real world problems.

Ordered Pairs

Graph points on a coordinate plane to solve real world and mathematical problems.

Graph Patterns

Graph ordered pairs on a coordinate plane to solve problems involving two numerical patterns.

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Unit: Operations and Algebraic Thinking

Duration: 20 Day(s)

Unit Overview

Students will write and interpret numerical expressions and analyze patterns and relationships.

Materials and Resources

- McGraw-Hill My Math textbook
- Do The Math: Marilyn Burns supplemental materials
- Internet resources including Promethean Planet (prometheanplanet.com), Project Based Learning (pbl-online.org), and National Library of Virtual Manipulatives (nlvm.usu.edu), IXL, Brain Pop, Khan Academy
- Common Core Standards and Strategies Flip Chart: Mentoring Minds

Academic Vocabulary

- repeating pattern
- continuing pattern
- equations
- solve
- variable
- order of operations
- parentheses
- unknown
- inverse operations
- equivalence
- properties
- function table
- patterns
- relations
- expressions
- multiples
- factors
- ordered pairs

Summative Assessment

Chapter Test provided by McGraw-Hill My Math

Topic: Write and interpret numerical expressions, analyze patterns

Duration: 10 Day(s)

Topic Overview

Students will use order of operations and expressions including variables. They will generate and interpret patterns.

Learning Targets

Numerical Expressions

Write and evaluate numerical expressions.

Order of Operations

Use the order of operations to evaluate expressions.

Write Numerical Expressions

Use numbers and operation symbols to write verbal phrases as numerical expressions.

Problem Solving- Work Backwards

Solve problems by working backwards.

Generate Patterns

Generate numerical patterns and identify pattern relationships.

Patterns

Identify and extend patterns and sequences.

Map Locations

Plot points on a grid to solve real world problems.

Ordered Pairs

Graph points on a coordinate plane to solve real world and mathematical problems.

Graph Patterns

Graph ordered pairs on a coordinate plane to solve problems involving two numerical patterns.

Unit: Number and Operations: Fractions

Duration: 45 Day(s)

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Grade(s) 5th, Duration 1 Year
Required Course

Unit Overview

Students will add, subtract, multiply, and divide fractions and mixed numbers accurately. They will use equivalent fractions to add and subtract fractions.

Materials and Resources

- Do The Math: Marilyn Burns supplemental materials
- McGraw-Hill My Math textbook chapters 8-10
- Internet resources including Promethean Planet (prometheanplanet.com), Project Based Learning (pbl-online.org), and National Library of Virtual Manipulatives (nlvm.usu.edu), IXL, Gamequarium fraction games, Mr. Nussbaum fraction games, Brain Pop, Khan Academy
- Common Core Standards and Strategies Flip Chart: Mentoring Minds
- fraction circles/bars

Academic Vocabulary

- numerator
- denominator
- equivalent fraction
- least common multiple
- greatest common factor
- reciprocals
- improper fraction
- mixed number
- multiples
- factors
- simplify
- simplest form
- reduce
- quotient
- product
- like fractions
- unlike fractions
- estimation
- reasonable

Summative Assessment

Chapter Test provided by McGraw-Hill My Math

Topic: Fraction Concepts and Decimal Equivalency

Duration: 10 Day(s)

Topic Overview

Students will learn how to use factors and multiples to solve problems.

Learning Targets

Fractions and Division

Solve word problems by interpreting a fraction as division of the numerator by the denominator.

Greatest Common Factor

Determine the common factors and the greatest common factor of a set of numbers.

Simplest Form

Generate equivalent fractions by writing a fraction in simplest form.

Problem-Solving Investigation: Guess, Check and Revise.

Guess, check and revise to solve problems.

Least Common Multiple

Determine the common multiples and the least common multiple of a set of numbers.

Compare fractions

Compare fractions by using the least common denominator.

Use models to write fractions as decimals.

Explore how to use models and fraction equivalence to write fractions as decimals.

Write fractions as decimals

Use fraction equivalence to write fractions as decimals.

Topic: Adding and Subtracting Fractions

Duration: 15 Day(s)

Topic Overview

Students will accurately and fluently add and subtract fractions with like and unlike denominators.

Learning Targets

Round fractions.

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Use number lines and benchmark fractions, such as $\frac{1}{2}$, to round fractions.
Add like fractions. Add like fractions and solve word problems involving the addition of like fractions.
Subtract like fractions. Subtract like fractions and solve word problems involving the subtraction of like fractions.
Use models to add unlike fractions. Use models to add unlike fractions.
Add unlike fractions. Add unlike fractions and solve word problems involving the addition of unlike fractions.
Use models to subtract unlike fractions. Use models to subtract unlike fractions.
Subtract unlike fractions. Subtract unlike fractions and solve word problems involving the subtraction of unlike fractions.
Problem Solving: Determine reasonable answers. Solve problems by determining reasonable answers.
Estimate sums and differences. Use number sense and benchmark fractions to estimate sums and differences.
Use models to add mixed numbers. Explore adding mixed numbers using models.
Add mixed numbers. Add mixed numbers and solve word problems involving the addition of mixed numbers.
Subtract mixed numbers. Subtract mixed numbers and solve word problems involving the subtraction of mixed numbers.
Subtract with renaming. Use fraction equivalence to subtract with renaming.

Topic: Multiplying and Dividing Fractions

Duration: 15 Day(s)

Topic Overview

Students will correctly multiply and divide fractions and mixed numbers.

Learning Targets

Part of a number. Explore how to find part of a number.
Estimate products of fractions. Estimate products of fractions using compatible numbers and rounding.
Model fraction multiplication. Explore multiplying whole numbers and fractions using models.
Multiply whole numbers and fractions. Multiply whole numbers and fractions.
Use models to multiply fractions. Explore using models to multiply a fraction by a fraction.
Multiply fractions. Multiply fractions.
Multiply mixed numbers. Multiply mixed numbers.
Multiplication as scaling. Interpret multiplication of fractions as scaling.
Division with unit fractions. Divide whole numbers by unit fractions using models.
Divide whole numbers by unit fractions. Use bar diagrams to divide whole numbers by unit fractions.
Divide unit fractions by whole numbers. Use bar diagrams to divide unit fractions by whole numbers.
Problem solving: draw a diagram.

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Required Course

Solve problems by drawing a diagram.

Unit: Measurement

Duration: 20 Day(s)

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Grade(s) 5th, Duration 1 Year
Required Course

Unit Overview

Students will convert like measurements within a given measurement system, will represent and interpret data, and will understand concepts of capacity in geometric measurement.

Materials and Resources

- McGraw-Hill My Math textbook chapter 11
- Do The Math: Marilyn Burns supplemental materials
- Internet resources including Promethean Planet (prometheanplanet.com), Project Based Learning (pbl-online.org), and National Library of Virtual Manipulatives (nlvm.usu.edu), IXL, Brain Pop, Khan Academy
- Common Core Standards and Strategies Flip Chart: Mentoring Minds
- Gallon Man
- Gallon house
- Inch Worm
- measuring cups
- teaspoons/tablespoons
- yard sticks
- meter sticks
- scale ruler (customary and metric units)

Academic Vocabulary

- yard
- inch
- mile
- convert
- length
- centimeter
- millimeter
- meter
- kilometer
- cup
- fluid ounce
- pint
- quart
- gallon
- capacity
- customary units
- metric units
- ton
- ounce
- pound
- units of mass
- ruler
- yard stick
- meter stick
- scales
- estimate
- round
- volume
- unit
- cubic units
- formula
- length
- width
- height
- area
- perimeter
- base
- prisms
- pyramids
- solid figures
- plane figures
- line plots
- line graph
- data
- outliers
- frequency table

Summative Assessment

Chapter Test provided by McGraw-Hill My Math

Topic: Measurement

Duration: 15 Day(s)

Mathematics (5)

Mathematics

Grade(s) 5th, Duration 1 Year
Required Course

Topic Overview

Students will convert units of measure including linear, capacity, weight, and time.

Learning Targets

Measure with a ruler.

Measure length to the nearest half and quarter inch.

Convert customary units of length.

Convert measurements of length within the customary system.

Problem solving: Use logical reasoning.

Solve problems by using logical reasoning.

Estimate and measure weight

Estimate the weight of objects and use a balance to measure the weight of objects.

Convert customary units of weight

Convert measurements of weight within the customary system.

Estimate and measure capacity

Estimate and measure the capacity of liquids.

Convert customary units of capacity

Convert measurements of capacity within the customary system.

Display measurement data on a line plot.

Display measurement data in fractions of a unit on a line plot and solve real-world problems.

Metric rulers

Measure the length of objects to the nearest centimeter and millimeter.

Convert metric units of length

Convert measurements of length within the metric system.

Estimate and measure metric mass

Estimate the mass of objects and use a balance to measure the mass of objects.

Convert metric units of mass

Convert measurements of mass within the metric system.

Convert metric units of capacity

Convert measurements of capacity within the metric system.

Unit: Geometry

Duration: 15 Day(s)

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Grade(s) 5th, Duration 1 Year
Required Course

Unit Overview

Students will classify two and three dimensional figures and find the volume of three-dimensional figures.

Materials and Resources

- McGraw-Hill My Math textbook chapter 12
- Do The Math: Marilyn Burns supplemental materials
- Internet resources including Promethean Planet (prometheanplanet.com), Project Based Learning (pbl-online.org), and National Library of Virtual Manipulatives (nlvm.usu.edu), IXL, Brain Pop, Khan Academy
- Common Core Standards and Strategies Flip Chart: Mentoring Minds
- Geoboards
- Snap Cubes
- attribute blocks
- tangrams

Academic Vocabulary

- parallelogram
- polygon
- prism
- rectangle
- rectangular prism
- rhombus
- hexagonal prism
- pentagonal prism
- right triangle
- scalene triangle
- isosceles triangle
- plane
- unit cube
- acute angle
- obtuse angle
- right angle
- equalateral
- trapezoid
- quadrilateral
- ordered pair
- x-axis
- y-axis
- coordinate grid
- origin
- perpendicular
- parallel
- line segment
- two-dimensional figures
- hexagon
- pentagon
- octagon

Summative Assessment

Chapter Test provided by McGraw-Hill My Math

Topic: Two- and three-dimensional figures

Duration: 10 Day(s)

Topic Overview

Students will use two- and three-dimensional figures to solve everyday problems.

Learning Targets

Polygons

Classify 2-dimensional figures based on properties.

Sides and angles of triangles

Measure the sides and angles of triangles.

Classify triangles

Classify triangles based on attributes such as side measures and angle measures.

Sides and angles of quadrilaterals

Measure the sides and angles of quadrilaterals.

Classify quadrilaterals

Classify quadrilaterals based on attributes such as congruent sides, parallel sides, and right angles.

Build three-dimensional figures

Build nets and explore properties of three-dimensional figures.

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Three-dimensional figures

Describe properties of three-dimensional figures.

Topic: Volume

Duration: 5 Day(s)

Topic Overview

Students will use volume to solve everyday problems.

Learning Targets

Use models to find volume

Use models to find the volume of rectangular prisms.

Volume of prisms

Use volume formulas to find the volume of rectangular prisms.

Build composite figures

Use models to build composite figures and find the volume of composite figures.

Volume of composite figures

Find the volume of composite figures by relating volume to the operations of multiplication and addition.

Problem solving: make a model

Make a model to solve problems.
