

# Unit 1: Understanding the Place Value System

Content Area: **Mathematics**  
Course(s):  
Time Period: **Generic Time Period**  
Length: **8 weeks**  
Status: **Published**

## Standards

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MA.5.5.NBT	Number and Operations in Base Ten
MA.5.5.NBT.A	Understand the place value system.
TECH.8.1.5	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.5.C	Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.5.E	Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.5.F	Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.5	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
TECH.8.2.5.E	Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.
LA.5.L.5.3	Use knowledge of language and its conventions when writing, speaking, reading, or listening.
PFL.9.1.8.B.8	Develop a system for keeping and using financial records.
MA.5.5.NBT.A.3a	Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$ .
MA.5.5.OA	Operations and Algebraic Thinking
MA.5.5.NBT.A.3b	Compare two decimals to thousandths based on meanings of the digits in each place, using $>$ , $=$ , and $<$ symbols to record the results of comparisons.
PFL.9.1.8.B.9	Determine the most appropriate use of various financial products and services (e.g., ATM, debit cards, credit cards, check books).
MA.5.5.OA.A	Write and interpret numerical expressions.
LA.5.W.5.10	Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.
MA.5.5.NBT.A.4	Use place value understanding to round decimals to any place.
MA.5.5.OA.A.1	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
MA.5.5.NBT.B	Perform operations with multi-digit whole numbers and with decimals to hundredths.

MA.5.5.OA.A.2	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.  For example, express the calculation “add 8 and 7, then multiply by 2” as $2 \times (8 + 7)$ . Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$ , without having to calculate the indicated sum or product.
LA.5.RI.5.7	Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
MA.5.5.NBT.B.5	Fluently multiply multi-digit whole numbers using the standard algorithm.
CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.
MA.5.5.NBT.B.6	Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
MA.5.5.NBT.B.7	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
LA.5.RI.5.3	Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
MA.5.5.NBT.A.1	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $1/10$ of what it represents in the place to its left.
MA.5.5.NBT.A.2	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
LA.5.W.5.4	Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1–3 above.)
MA.5.5.NBT.A.3	Read, write, and compare decimals to thousandths.
CAEP.9.2.8.B.1	Research careers within the 16 Career Clusters <sup>®</sup> and determine attributes of career success.

## Learning Objectives

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### Unit Focus:

- Write and interpret numerical expressions
- Understand the place value system
- Perform operations with multi-digit whole numbers and with decimals to hundredths

**Critical Area:**

Extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations.

**Chapter One:****Lesson Learning Objectives:**

- 1.1:** Recognize the 10 to 1 relationship among place-value positions.
- 1.2:** Read and write whole numbers through hundred millions.
- 1.3:** Use properties of operations to solve problems.
- 1.4:** Write and evaluate repeated factors in exponent form.
- 1.5:** Use a basic fact and a pattern to multiply mentally by multiples of 10, 100, and 1,000.
- 1.6:** Multiply by 1-digit numbers.
- 1.7:** Multiply by multi-digit numbers.
- 1.8:** Use multiplication to solve division problems.
- 1.9:** Use the strategy solve a simpler problem to solve problems.
- 1.10:** Write numerical expressions.
- 1.11:** Use the order of operations to evaluate numerical expressions.
- 1.12:** Evaluate numerical expressions with parentheses, brackets, and braces.

**Chapter Two:****Lesson Learning Objectives:**

- 2.1:** Place the first digit in the quotient by estimating or using place value.
- 2.2:** Divide 3- and 4- digit dividends by 1-digit divisors.
- 2.3:** Model division with 2-digit divisors using base-ten blocks.

- 2.4:** Use partial quotients to divide by 2-digit divisors.
- 2.5:** Estimate quotients using compatible numbers.
- 2.6:** Divide by 2-digit divisors.
- 2.7:** Solve division problems and decide when to write a remainder as a fraction.
- 2.8:** Adjust the quotient if the estimate is too high or too low.
- 2.9:** Solve problems by using the strategy draw a diagram.

### **Chapter Three:**

#### **Lesson Learning Objectives:**

- 3.1:** Model, read, and write decimals to thousandths.
- 3.2:** Read and write decimals through thousandths.
- 3.3:** Compare and order decimals to thousandths using place value.
- 3.4:** Round decimals to any place.
- 3.5:** Model decimal addition using base-ten blocks.
- 3.6:** Model decimal subtraction using base-ten blocks.
- 3.7:** Make reasonable estimates of decimal sums and differences.
- 3.8:** Add decimals using place value.
- 3.9:** Subtract decimals using place value.
- 3.10:** Identify, describe, and create numeric patterns with decimals.
- 3.11:** Solve problems using the strategy make a table.
- 3.12:** Choose a method to find a decimal sum or difference.

### **Chapter Four:**

#### **Lesson Learning Objectives:**

- 4.1: Find patterns in products when multiplying by powers of 10.
- 4.2: Model multiplication of whole numbers and decimals.
- 4.3: Multiply a decimal and a whole number using properties and place value.
- 4.4: Use expanded form and place value to multiply a decimal and a whole number.
- 4.5: Solve problems using the strategy draw a diagram to multiply money.
- 4.6: Model multiplication of decimals.
- 4.7: Place the decimal point in decimal multiplication.
- 4.8: Multiply decimals with zeros in the product.

## **Chapter Five:**

### **Lesson Learning Objectives:**

- 5.1: Find patterns in quotients when dividing by powers of 10.
- 5.2: Model division of decimals by whole numbers.
- 5.3: Estimate decimal quotients.
- 5.4: Divide decimals by whole numbers.
- 5.5: Model division by decimals.
- 5.6: Place the decimal point in decimal division.
- 5.7: Write a zero in the dividend to find a quotient.
- 5.8: Solve multistep decimal problems using the strategy work backward.

## **Essential Questions**

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## **Chapter One:**

### **Chapter Essential Question:**

How can you use place value, multiplication, and expressions to represent and solve problems?

### **Lesson Essential Questions:**

- 1.1:** How can you describe the relationship between two place-value positions?
- 1.2:** How do you read, write, and represent whole numbers through hundred millions?
- 1.3:** How can you use properties of operations to solve problems?
- 1.4:** How can you use an exponent to show powers of 10?
- 1.5:** How can you use a basic fact and a pattern to multiply by a 2-digit number?
- 1.6:** How do you multiply by 1-digit numbers?
- 1.7:** How do you multiply by multi-digit numbers?
- 1.8:** How is multiplication used to solve a division problem?
- 1.9:** How can you use the strategy solve a simpler problem to help you solve a division problem?
- 1.10:** How can you use a numerical expression to describe a situation?
- 1.11:** In what order must operations be evaluated to find the solution to a problem?
- 1.12:** In what order must operations be evaluated to find a solution when there are parentheses within parentheses?

## **Chapter Two:**

### **Chapter Essential Question:**

How can you divide whole numbers?

### **Lesson Essential Questions:**

- 2.1:** How can you tell where to place the first digit of a quotient without dividing?
- 2.2:** How do you solve and check division problems?
- 2.3:** How can you use base-ten blocks to model and understand division of whole numbers?

- 2.4:** How can you use partial quotients to divide by 2-digit divisors?
- 2.5:** How can you use compatible numbers to estimate quotients?
- 2.6:** How can you divide by 2-digit divisors?
- 2.7:** When solving a division problem, when do you write the remainders as a fraction?
- 2.8:** How can you adjust the quotient if your estimate is too high or too low?
- 2.9:** How can the strategy draw a diagram help you solve a division problem?

### **Chapter Three:**

#### **Chapter Essential Question:**

How can you add and subtract decimals?

#### **Lesson Essential Questions:**

- 3.1:** How can you describe the relationship between two decimal place-value positions?
- 3.2:** How do you read, write, and represent decimals through thousandths?
- 3.3:** How can you use place value to compare and order decimals?
- 3.4:** How can you use place value to round decimals to a given place value?
- 3.5:** How can you use base-ten blocks to model decimal addition?
- 3.6:** How can you use base-ten blocks to model decimal subtraction?
- 3.7:** How can you estimate decimal sums and differences?
- 3.8:** How can place value help you add decimals?
- 3.9:** How can place value help you subtract decimals?
- 3.10:** How can you use addition or subtraction to describe a pattern or create a sequence with decimals?
- 3.11:** How can the strategy make a table help you organize and keep track of your bank account balance?
- 3.12:** Which method could you choose to find decimal sums and differences?

## **Chapter Four:**

### **Chapter Essential Question:**

How can you solve decimal multiplication problems?

### **Lesson Essential Questions:**

- 4.1:** How can patterns help you place the decimal point in a product?
- 4.2:** How can you use a model to multiply a whole number and a decimal?
- 4.3:** How can you use properties and place value to multiply a decimal and a whole number?
- 4.4:** How can you use expanded form and place value to multiply a decimal and a whole number?
- 4.5:** How can the strategy draw a diagram help you solve a decimal multiplication problem?
- 4.6:** How can you use a model to multiply decimals?
- 4.7:** What strategies can you use to place a decimal point in a product?
- 4.8:** How do you know you have the correct number of decimal places in your product?

## **Chapter Five:**

### **Chapter Essential Question:**

How can you solve decimal division problems?

### **Lesson Essential Questions:**

- 5.1:** How can patterns help you place the decimal point in a quotient?
- 5.2:** How do you use a model to divide a decimal by a whole number?
- 5.3:** How can you estimate decimal quotients?
- 5.4:** How can you divide decimals by whole numbers?
- 5.5:** How can you use a model to divide by a decimal?
- 5.6:** How can you place the decimal point in the quotient?
- 5.7:** When do you write a zero in the dividend to find a quotient?

**5.8:** How can you use the strategy work backward to solve multistep decimal problems?

## **Materials**

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Go Math Digital Resources:

iStudent Edition

eTeacher Edition

Personal Math Trainer

Math on the Spot Video

Real World Video

Animated Math Models

iTools

HMH Mega Math

iPad

Computer

Go Math Print Resources:

Student Edition

Practice and Homework (in the Student Edition)

Reteach (in the Chapter Resources)

Enrich (in the Chapter Resources)

Grab-and-Go Centers Kit

Achieve the Core:

<http://achievethecore.org/page/2853/go-math-k-5-guidance-documents>

## **Activities**

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### **Fluency with Whole Numbers and Decimals**

**Unit Project:** In the Chef's Kitchen

### **Chapter One: Place Value, Multiplication, & Expressions**

Vocabulary Game: Going to London, England

Lesson 1: Investigate-Place Value and Patterns

Lesson 2: Place Value of Whole Numbers

Lesson 3: Algebra-Properties

Lesson 4: Algebra-Powers of 10 and Exponents

Lesson 5: Algebra-Multiplication Patterns

Mid-Chapter Checkpoint

Lesson 6: Multiply by 1-Digit Numbers

Lesson 7: Multiply by Multi-Digit Numbers

Lesson 8: Relate Multiplication to Division

Lesson 9: Problem Solving-Multiplication and Division

Lesson 10: Algebra-Numerical Expressions

Lesson 11: Algebra-Evaluate Numerical Expressions

Lesson 12: Algebra-Grouping Symbols

## **Chapter Two: Divide Whole Numbers**

Vocabulary Game: Matchup

Lesson 1: Place the First Digit

Lesson 2: Divide by 1-Digit Divisors

Lesson 3: Investigate-Division with 2-Digit Divisors

Lesson 4: Partial Quotients

Mid-Chapter Checkpoint

Lesson 5: Estimate with 2-Digit Divisors

Lesson 6: Divide by 2-Digit Divisors

Lesson 7: Interpret the Remainders

Lesson 8: Adjust Quotients

Lesson 9: Problem Solving-Division

## **Chapter Three: Add and Subtract Decimals**

Vocabulary Game: Pick It

Lesson 1: Investigate-Thousandths

Lesson 2: Place Value of Decimals

Lesson 3: Compare and Order Decimals

Lesson 4: Round Decimals

Lesson 5: Investigate-Decimal Addition

Lesson 6: Investigate-Decimal Subtraction

Mid-Chapter Checkpoint

Lesson 7: Estimate Decimal Sums and Differences

Lesson 8: Add Decimals

Lesson 9: Subtract Decimals

Lesson 10: Algebra-Patterns with Decimals

Lesson 11: Problem Solving-Add and Subtract Money

Lesson 12: Choose a Method

#### **Chapter Four: Multiply Decimals**

Vocabulary Game: Bingo

Lesson 1: Algebra-Multiplication Patterns with Decimals

Lesson 2: Investigate-Multiply Decimals and Whole Numbers

Lesson 3: Multiplication with Decimals and Whole Numbers

Lesson 4: Multiply Using Expanded Form

Lesson 5: Problem Solving-Multiply Money

Mid-Chapter Checkpoint

Lesson 6: Investigate-Decimal Multiplication

Lesson 7: Multiply Decimals

Lesson 8: Zeros in the Product

#### **Chapter Five: Divide Decimals**

Vocabulary Game: Picture It!

Lesson 1: Algebra-Division Patterns with Decimals

Lesson 2: Investigate-Divide Decimals by Whole Numbers

Lesson 3: Estimate Quotients

Lesson 4: Division of Decimals by Whole Numbers

Mid-Chapter Checkpoint

Lesson 5: Investigate-Decimal Division

Lesson 6: Divide Decimals

Lesson 7: Write Zeros in the Dividend

Lesson 8: Problem Solving-Decimal Operations

Other Activities:

[5.OA.A.1 Using Operations and Parentheses](#)

[5.OA.A.1 Watch out for Parentheses 1](#)

[5.NBT.A.1 Which number is it?](#)

[5.NBT.A.1 Millions and Billions of People](#)

[5.NBT.A.3 Placing Thousandths on the Number Line](#)

[5.NBT.A.4 Rounding to Tenths and Hundredths](#)

[5.NBT.B.5 Elmer's Multiplication Error](#)

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## **Assessment**

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MAP Assessment

Diagnostic:

Show What You Know

Digital Personal Math Trainer

Formative:

Lesson Quick Check

Mid-Chapter Checkpoint

Digital Personal Math Trainer

- Assessment Animation
- Assessment Video

Summative:

Chapter Review/Test

Chapter Test

Performance Assessment Task

Digital Personal Math Trainer

## **Fact Fluency**

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Go Math Resources for Fact Fluency

- Fluency Standard Lessons (Student Edition)
- Fluency Builder (Teacher Edition)
- Strategies and Practice for Skills and Facts Fluency-Intermediate G3-6
- HMH Mega Math
- Personal Math Trainer: Standards Quizzes
- Animated Math Models

## Other Resources for Fact Fluency

- Mad Minutes
- Rocket Math

MA.5.5.NBT.B.5

Fluently multiply multi-digit whole numbers using the standard algorithm.

## **Accomodations and Modifications**

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Materials and Resources that provide opportunities to accommodate and modify include:

Personal Math Trainer (adaptive assessment and intervention system)

Interactive Student Edition

Leveled Quizzes, Tests, and Performance Tasks

Grab & Go Differentiated Centers

Intensive Intervention Resource

Strategic Intervention Resource

Reteach Activities

RTI Tiered Resources and Activities

Math on the Spot Videos

## **Others/Notes**

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Standards for Mathematical Practice

MP.1 Make sense of problems and persevere in solving them.

MP.2 Reason abstractly and quantitatively.

MP.3 Construct viable arguments and critique the reasoning of others.

MP.4 Model with mathematics.

MP.5 Use appropriate tools strategically.

MP.6 Attend to precision.

MP.7 Look for and make use of structure.

MP.8 Look for and express regularity in repeated reasoning.