Unit 1: Place Value, Operations with Whole Numbers, & Multi-Digit Arithmetic

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

Standards

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
MA.4.4.NBT.A.1	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.
MA.4.4.OA.A.1	Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
	For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.
MA.4.4.NBT.B.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
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.
MA.4.4.NBT.B.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
MA.4.4.OA.A.2	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

LA.4.W.4.10	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.
CRP.K-12.CRP1.1	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
LA.4.RI.4.4	Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.
MA.4.4.NBT.A.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.
MA.4.4.NBT.A.3	Use place value understanding to round multi-digit whole numbers to any place.
MA.4.4.NBT.B.6	Find whole-number quotients and remainders with up to four-digit dividends and one-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.4.4.OA.A.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
LA.4.SL.4.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
LA.4.SL.4.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
CRP.K-12.CRP11	Use technology to enhance productivity.
LA.4.SL.4.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.
LA.4.SL.4.1.C	Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
LA.4.L.4.3	Use knowledge of language and its conventions when writing, speaking, reading, or listening.
LA.4.SL.4.1.D	Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
CRP.K-12.CRP11.1	Career-ready individuals find and maximize the productive value of existing and

	new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
CAEP.9.2.4.A.4	Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.
LA.4.SL.4.3	Identify the reasons and evidence a speaker provides to support particular points.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
LA.4.L.4.1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
LA.4.L.4.6	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., quizzed, whined, stammered) and that are basic to a particular topic (e.g., wildlife, conservation, and endangered when discussing animal preservation).
CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP6.1	Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

Learning Objectives

Unit Focus:

- Use the four operations with whole numbers to solve problems.

- Generalize place value understanding for multi-digit whole numbers.

- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Critical Area:

Developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find

quotients involving multi-digit dividends.

Chapter One: Lesson Learning Objectives

1.1   Model the 10 to 1 relationship among place-value positions in the base-ten number system.

1.2   Read and write whole numbers in standard form, word form, and expanded form.

1.3   Compare and order whole numbers based on the values of the digits in each number.

1.4   Round a whole number to any place.

1.5   Rename whole numberes by regrouping.

1.6   Add whole numbers and determine whether solution to addition problems are reasonable.

1.7   Subtract whole numbers and determine whether solutions to subtraction problems are reasonable.

1.8   Use the strategy draw a diagram to solve comparison problems with addition and subtraction.

Chapter Two: Lesson Learning Objectives

2.1   Relate multiplication equations and comparison statements.

2.2   Solve problems involving multiplicative comparison and additive comparison.

2.3   Multiply tens, hundreds, and thousands by whole numbers through 10.

2.4   Estimate products by rounding and determine if exact answers are reasonable.

2.5   Use the Distributive Property to multiply a 2-digit number by a 1-digit number.

2.6   Use expanded form to multiply a multidigit number by a 1-digit number.

2.7   Use place value and partial products to multiply a mutidigit number by a 1-digit number.

2.8   Use mental math and properties to multiply a multidigit number by a 1-digit number.

2.9   Use the draw a diagram strategy to solve multistep problems.

2.10   Use regrouping to multiply a 2-digit number by a 1-digit number.

2.11   Use regrouping to multiply a multidigit number by a 1-digit number.

2.12 Represent and solve multistep problems using equations.

Chapter Three: Lesson Learning Objectives

3.1 Use place value and multiplication properties to multiply by tens.

3.2 Estimate products by rounding or by using compatible numbers.

3.3 use area models and partial products to multiply 2-digit numbers.

3.4 Use place value and partial products to multiply 2-digit numbers.

3.5 Use regrouping to multiply 2-digit numbers.

3.6 Choose a method to multiply 2-digit numbers.

3.7 Use the strategy draw a diagram to solve multistep multiplication problems.

Chapter Four: Lesson Learning Objectives

4.1 Use multiples to estimate quotients.

4.2 Use models to divide whole numbers that do not divide evenly.

4.3 Use remainders to solve division problems.

4.4 Divide tens, hundreds, and thousands by whole numbers to 10.

4.5 Use compatible numbers to estimate quotients.

4.6 Use the Distributive Property to find quotients.

4.7 Use repeated subtraction and multiples to find quotients.

4.8 Use partial quotients to divide.

4.9 Use base-ten blocks to model division with regrouping.

4.10 Use place value to determine where to place the first digit of a quotient.

4.11 Divide multidigit numbers by 1-digit divisors.

4.12 Solve problems by using the strategy draw a diagram.

Chapter Five: Lesson Learning Objectives

5.1   Find all the factors of a number by using models.

5.2   Determine whether a number is a factor of a given number.

5.3   Solve problems with common factors by using the strategy make a list.

5.4   Understand the relationship between factos and multiples, and determine whether a number is a multiple of a given number.

5.5   Determine whether a number is prime or composite.

5.6   Generate a number patter and describe features of the pattern.

Essential Questions

Chapter One: Essential Question

How can you use place value to compare, add, subtract, and estimate with whole numbers?

Lesson Essential Questions:

1.1   How can you describe the value of a digit?

1.2   How can you read and write numbers through hundred thousands?

1.3   How can you compare and order numbers?

1.4   How can you round numbers?

1.5   How can you rename a whole number?

1.6   How can you add whole numbers?

1.7 How can you subtract whole numbers?

1.8 How can you use the strategy draw a diagram to solve comparison problems with addition and subtraction?

Chapter Two: Essential Question

What strategies can you use to multiply by 1-digit numbers?

Lesson Essential Questions:

2.1 How can you model multiplication comparisons?

2.2 How does a model help you solve a comparison problem?

2.3 How does understanding place value help you multiply tens, hundreds, and thousands?

2.4 How can you estimate products by rounding and determine if exact answers are reasonable?

2.5 How can you use the Distributive Property to multiply a 2-digit number by a 1-digit number?

2.6 How can you use expanded for to multiply a multidigit number by a 1-digit number?

2.7 How can you use place value and partial products to multiply by a 1-digit number?

2.8 How can you use mental math and properties to help you multiply numbers?

2.9 When can you use the draw a diagram strategy to solve a multistep multiplication problem?

2.10 How can you use regrouping to multiply a 2-digit number by a 1-digit number?

2.11 How can you use regrouping to multiply?

2.12 How can you represent and solve multistep problems using equations?

Chapter Three: Essential Question

What strategies can you use to multiply 2-digit numbers?

Lesson Essential Questions:

3.1   What strategies can you use to multiply by tens?

3.2   What strategies can you use to estimate products?

3.3   How can you use area models and partial products to multiply 2-digit numbers?

3.4   How can you use place value and partial products to multiply 2-digit numbers?

3.5   How can you use regrouping to multiply 2-digit numbers?

3.6   How can you find and record products of two 2-digit numbers?

3.7   How can you use the strategy draw a diagram to solve multistep multiplication problems?

Chapter Four: Essential Question

How can you divide by 1-digit numbers?

Lesson Essential Questions:

4.1   How can you use multiples to estimate quotients?

4.2   How can you use models to divide whole numbers that do not divide evenly?

4.3   How can you use remainders in division problems?

4.4   How can you divide numbers through thousands by whole numbers to 10?

4.5   How can you use compatible numbers to estimate quotients?

4.6   How can you use the Distributive Property to find quotients?

4.7   How can you use repeated subtraction and multiples to find quotients?

4.8   How can you use partial quotients to divide by 1-digit divisors?

4.9   How can you use base-ten blocks to model division with regrouping?

4.10   How can you use place value to know where to place the first digit in the quotient?

4.11   How can you divide multidigit numbers and check your answers?

4.12   How can you use the strategy draw a diagram to solve multistep division problems?

Chapter Five Essential Question:

How can you find factors and multiples, and how can you generate and describe number patterns?

Lesson Essential Questions:

5.1   How can you use models to find factors?

5.2 How can you tell whether one number is a factor of another number?

5.3   How can you use the make a list strategy to solve problems with common factors?

5.4   How are factors and multiples related?

5.5   How can you tell whether a number is prime or composite?

5.6   How can you make and describe patterns?

Materials

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

Place Value and Operations with Whole Numbers

Unit Project: Food in Space

Chapter One: Place Value and Operations with Whole Numbers

Vocabulary Game: Going Into Space

Lesson 1.1   Model Place Value Relationships

Lesson 1.2   Read and Write Numbers

Lesson 1.3   Compare and Order Numbers

Lesson 1.4   Round Numbers

Chapter Four: Divide by 1-Digit Numbers

Chapter Five: Factors, Multiples, and Patterns

Vocabulary Game: Guess the Word

Lesson 1: Model Factors

Lesson 2: Factors and Divisibility

Lesson 3: Problem Solving - Common Factors

Mid-Chapter Checkpoint

Lesson 4: Factors and Multiples

Lesson 5: Prime and Composite Numbers

Lesson 6: Algebra - Number Patterns

Other Activities:

4.OA.B Identifying Multiples

4.OA.B Numbers in a Multiplication Table

4.OA.C.5 Double Plus One

4.MD.A.1 Who is the tallest?

4.OA.A.2 Comparing Money Raised

4.NBT.A.1 Thousands and Millions of Fourth Graders

4.NBT.A.2 Ordering 4-digit numbers

4.NBT.A.3 Rounding on the Number Line

4.NBT.B To regroup or not to regroup

4.NBT.B.6 mental Division Strategy

4.OA.A.3, 4.MD.A.3 Karl's Garden

Assessment

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

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:

Mad Minute

Rocket Math

FASTT Math

Flash Cards

MA.4.4.NBT.B.4   Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Accommodations and Modifications

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

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 apporpriate 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.