Unit 03: Operations with Decimals

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **3 weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

In this unit, students will make sense of and use the four basic arithmetic operations with decimal numbers. They will also recognize which operation(s) will be helpful to solve problems and use estimation to make sure that their answers are accurate.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Objectives:

- Add, subtract, multiply, and divide decimals
- Use long division to find terminating and repeating decimals
- Solve real-world problems involving decimals

Essential Question:

- How do we solve real world application decimal problems?

Enduring Understandings:

- Number forms and expressions can be manipulated and translated to be more or less appropriate for a context or procedure for solving.
- Numerical operations are an essential part of solving problems in the real world.

CONTENT AREA STANDARDS

6.RP

A. Understand ratio concepts and use ratio reasoning to solve problems

6.NS

B. Compute fluently with multi-digit numbers & find common factors & multiples

C. Apply and extend previous understandings of numbers to the system of rational numbers

6.EE

A. Apply and extend previous understandings of arithmetic to algebraic expressions

B. Reason about and solve one-variable equations and inequalities

C. Represent and analyze quantitative relationships between dependent and independent variables

6.SP

A. Develop understanding of statistical variability

B. Summarize and describe distributions

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.6.RP.A.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
MA.K-12.2	Reason abstractly and quantitatively.
MA.6.RP.A.2	Understand the concept of a unit rate a/b associated with a ratio $a{:}b$ with $b \neq 0$, and use rate language in the context of a ratio relationship.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.6.RP.A.3	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.
MA.K-12.5	Use appropriate tools strategically.
MA.6.RP.A.3b	Solve unit rate problems including those involving unit pricing and constant speed.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.
MA.6.NS.A.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.
MA.6.NS.B.2	Fluently divide multi-digit numbers using the standard algorithm.
MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
MA.6.EE.A.2	Write, read, and evaluate expressions in which letters stand for numbers.
MA.6.EE.A.2a	Write expressions that record operations with numbers and with letters standing for numbers.
MA.6.EE.B.5	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
MA.6.EE.B.6	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.
MA.6.EE.B.7	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.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

9.1.8.PB.6: Construct a budget to save for short-term, long term, and charitable goals.

LA.K-12.NJSLSA.R10	Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed.
LA.K-12.NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
CS.K-12.3	Recognizing and Defining Computational Problems
CS.K-12.3.a	Identify complex, interdisciplinary, real-world problems that can be solved computationally.
CS.K-12.3.b	Decompose complex real-world problems into manageable sub-problems that could integrate existing solutions or procedures.
CS.K-12.3.c	Evaluate whether it is appropriate and feasible to solve a problem computationally.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.

STUDENT LEARNING TARGETS

Refer to the 'Declarative Knowledge' and 'Procedural Knowledge sections.

Declarative Knowledge

Students will understand that:

- Content-specific vocabulary: dividend, divisor, quotient, estimate, ratio, repeating decimal, terminating decimal, unit rate
- The standard algorithm for dividing multi-digit numbers.
- The standard algorithms for adding, subtracting, multiplying and dividing decimals.

Procedural Knowledge

Students will be able to:

- Fluently divide multi-digit numbers using the standard algorithm.
- Add, subtract, multiply, and divide multi-digit decimals using the standard logarithm for each operation fluently.

EVIDENCE OF LEARNING

Refer to the 'Formative Assessments' and 'Summative Assessments' sections.

Formative Assessments

- Observations
- Classwork
- Homework Assignments
- Do Now Questions
- Exit Tickets
- Self Assessment Questions
- Proficiency Scale

Summative Assessments

- Quizzes

- Unit Assessments

- Graded Assignments

- Projects

RESOURCES (Instructional, Supplemental, Intervention Materials)

- *CMP3 Decimal Ops (Investigations 1-3)*
- Savvas Realize (teacher and student resources)
- Additional Resources linked HERE
- Khan Academy
- Delta Math
- Illustrative Math Performance Tasks:
  - 6.NS.B.3 Jayden's Snacks
  - 6.NS.B.3 Buying Gas
  - 6.NS.B.3 Reasoning about Multiplication and Division and Place Value, Part 1
  - 6.NS.B.3 Movie Tickets
  - 6.NS.B.3 What is the Best Way to Divide?
  - 6.NS.B.3 Changing Currency

- [IXL](#)- Recommended Skills Practice
  - G.1 Add & Subtract Decimal Numbers
  - G.2 Add & Subtract Decimals: Word Problems
  - H.2 Multiply Decimals
  - H.4 Divide Decimals by Whole Numbers
  - H.8 Division with Decimal Quotients
  - H.10 Multiply & Divide Decimals: Word Problems

INTERDISCIPLINARY CONNECTIONS

- Computations
- Financial/Economic/Business/Entrepreneurial Literacy

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.