Unit 5: Arithmetic in Base Ten

Content Area: **Mathematics**
Course(s): **Math - Grade 6**
Time Period: **January**
Length: **16-18 days**
Status: **Published**

Unit Overview

In this unit, students compute sums, differences, products, and quotients of multi-digit whole numbers and decimals, using efficient algorithms. They use calculations with whole numbers and decimals to solve problems set in real-world contexts.

Transfer

Students will be able to independently use their learning to solve real world situations including:

- adding, subtracting, multiplying, and dividing decimals and whole whole numbers.
- estimation.

Meaning

Understandings

Students will understand that:

- which operation to use in real-world fraction and decimal problems.
- an estimation can be used to see if an answer to a problem "makes sense."

Essential Questions

How can mathematical ideas be represented?

How can estimating be helpful?

Application of Knowledge and Skill

Students will know...

Students will know:

- the vocbulary that goes along with the unit.
- add, subtract, multiply and divide multi-digit decimals using the standard algorithm.

Students will be skilled at...

Students will be skilled at:

- adding, subtracting, multiplying, and dividing decimals and whole numbers.

Learning Goal

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

Vocabulary

digits, budget, at least, base-ten diagram, bundle, vertical calculations, unbundle, method, powers of 10, partial product, partial quotients, long division, percision, accuracy, operation

Daily Target- Lesson 1

- Calculate sums and products of decimals in the context of money, and explain (orally and in writing) the calculation strategy
- Estimate sums, differences, products, and quotients of decimals in the context of money, and explain (orally) the estimation strategy.

Desmos The Decimal Challenge https://teacher.desmos.com/activitybuilder/custom/59430ad35104d74a1fc62e78

Desmos practice operations with decimals https://teacher.desmos.com/activitybuilder/custom/5e77c902eddd621251ce835c

MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Daily Target- Lesson 2

- Compare and contrast (orally and in writing) vertical calculations and base-ten diagrams that represent adding and subtracting decimals.
- Explain (in words and through other representations) that adding and subtracting decimals requires combining digits that represent like base-ten units.
- Interpret and create diagrams that represent 10 like base-ten units being composed into 1 unit of higher place value, e.g., 10 tenths as 1 one, and comprehend the word "bundle" to refer to this concept.

Desmos https://teacher.desmos.com/activitybuilder/custom/5e8e5970689acf7b608511da

MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Daily Target- Lesson 3

- Add or subtract decimals, and explain the reasoning (using words and other representations).
- Comprehend the term "unbundle" means to decompose a larger base-ten unit into 10 units of lower place value (e.g., 1 tenth as 10 hundredths).
- Recognize and explain (orally) that writing additional zeros or removing zeros after the last non-zero digit in a decimal does not change its value.

Desmos Decimal addition and subtracting https://teacher.desmos.com/activitybuilder/custom/5a9881aa63324f08b1573d36

MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Daily Target- Lesson 4

- Add or subtract decimals with multiple non-zero digits, and explain (orally) the solution method.
- Interpret a description (in written language) of a real-world situation involving decimals, and write an addition or subtraction problem to represent it.
- Recognize and explain (orally) that vertical calculation is an efficient strategy for adding and subtracting decimals, especially decimals with multiple non-zero digits.

MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Daily Target- Lesson 5

- Generalize (orally and in writing) that the number of decimal places in a product is related to the number of decimal places in the factors.
- Justify (orally) the product of two decimals, which each have only one non-zero digit, by multiplying equivalent fractions that have a power of ten in the denominator.

Desmos https://teacher.desmos.com/activitybuilder/custom/5e0560c8531c0f294457021a

MA.6.NS.B	Compute fluently with multi-digit numbers and find common factors and multiples.
MA.6.EE.A	Apply and extend previous understandings of arithmetic to algebraic expressions.

Daily Target- Lesson 6

- Interpret different methods for computing the product of decimals, and evaluate (orally) their usefulness.
- Justify (orally, in writing, and through other representations) where to place the decimal point in the product of two decimals with multiple non-zero digits.

Desmos (lesson 6 or 7) https://teacher.desmos.com/activitybuilder/custom/5df8bfcd8e46f261acdde8bf

MA.6.NS.B	Compute fluently with multi-digit numbers and find common factors and multiples.

Daily Target- Lesson 7

- Comprehend how the phrase “partial products” (in spoken and written language) refers to decomposing a multiplication problem.
- Coordinate area diagrams and vertical calculations that represent the same decimal multiplication problem.
- Use an area diagram to represent and justify (orally and in writing) how to find the product of two decimals.

MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Daily Target- Lesson 8

- Draw and label a diagram to check the answer to a decimal multiplication problem.
- Interpret a description (in written language) of a real-world situation involving multiplication of decimals, and write a multiplication problem to represent it.
- Use an algorithm to calculate the product of two decimals, and explain (orally) the solution method.

Desmos https://teacher.desmos.com/activitybuilder/custom/5d8ffe5a57061623f07a50ec

MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Daily Target- Lesson 9

- Comprehend that the phrase "partial quotients" (in spoken and written language) refers to decomposing a division problem.
- Divide whole numbers that result in a whole-number quotient, and explain the reasoning (using words and other representations).
- Interpret different methods for computing the quotient of whole numbers, i.e., base-ten diagrams and partial quotients, and evaluate (orally) their usefulness.

MA.6.NS.B.2	Fluently divide multi-digit numbers using the standard algorithm.

Daily Target- Lesson 10

- Interpret the long division method, and compare and contrast it (orally) with other methods for computing the quotient of whole numbers.
- Recognize and explain (orally) that long division is an efficient strategy for dividing numbers, especially with multi-digit dividends.
- Use long division to divide whole numbers that result in a whole-number quotient, and multiply the quotient by the divisor to check the answer.

MA.6.NS.B.2	Fluently divide multi-digit numbers using the standard algorithm.

Daily Target- Lesson 11

- Interpret different methods for computing a quotient that is not a whole number, and express it (orally and in writing) in terms of "unbundling."
- Use long division to divide whole numbers that result in a quotient with a decimal, and explain (orally) the solution method.

MA.6.NS.B.2	Fluently divide multi-digit numbers using the standard algorithm.

Daily Target- Lesson 12

- Compare and contrast (orally and using other representations) division problems with whole-number and decimal dividends
- Divide decimals by whole numbers, and explain the reasoning (orally and using other representations).
- Generalize (orally and in writing) that multiplying both the dividend and the divisor by the same factor does not change the quotient.

MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Daily Target- Lesson 13

- Compare and contrast (orally and using other representations) division problems with whole-number and decimal divisors.
- Divide whole numbers or decimals by decimals, and explain the reasoning (orally and using other representations), including choosing to divide a different expression that gets the same quotient.
- Generate another division expression that has the same value as a given expression, and justify (orally) that they are equal.

Desmos https://teacher.desmos.com/activitybuilder/custom/5e8e576d986df779e35b9134

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.4	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).

Daily Target- Lesson 14

- Apply operations with decimals to solve problems about the dimensions of a sports field or court, and explain (orally, in writing, and using other representations) the solution method.
- Choose whether an exact answer or an estimate is appropriate for a given problem.
- Interpret a verbal description or diagram that represents the dimensions of a sports field or court.

MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Daily Target- Lesson 15

- Apply operations with decimals to calculate the surface area of paper boxes.
- Describe (orally) sources of measurement error, and justify an appropriate level of precision for reporting the answer.
- Measure and compare (orally and in writing) the dimensions of paper boxes.

MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Summative Assessment

Group Presentation

Chapter Test

Chapter Project

21st Century Life and Careers

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.
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.
CRP.K-12.CRP2	Apply appropriate academic and technical skills.
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.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
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.
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.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
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.

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.
CAEP.9.2.8.B.6	Demonstrate understanding of the necessary preparation and legal requirements to enter the workforce.
TECH.8.1.8.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.8.B.CS2	Create original works as a means of personal or group expression.
TECH.8.1.8.D	Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
TECH.8.1.8.D.CS1	Advocate and practice safe, legal, and responsible use of information and technology.

Formative Assessment and Performance Opportunities

Use the Lists tab.

- Academic Game
- BrainPop
- Centers
- Class Discussions
- Clickers
- Desmos
- Do Now
- Exit Ticket
- Graphic Organizer
- LinkIT
- Project
- Quiz
- Self-Assessment
- Student Teacher
- Teacher Interview
- Teacher Observation
- Think, Pair, Share

Accommodations and Modifications

- Teacher provides notes for student(s)
- Teacher will modify test for student(s)
- Students may use graph paper to help organize data
- A word bank can be provided
- Leveled centers can be used
- Small group instruction can be utilized
- Calculators may be used
- Extra Practice Board can be utilized to review pre-requisite skills

- Interactive games/websites may be used to practice skills
- Teacher can conference with student(s) to "check-in"
- Uitilize items in the room to demonstrate skills as they relate to their life (book to wrap for SA, etc.)
- Use coordinate plane to count spaces for area and surface area
- Use blocks to help visualize volume of 3D shapes

- Calculators
- Compass Learning
- Extra Practice Board
- Interactive Games/Websites
- Leveled Centers
- Manipulatives
- Modify Assessments
- Provide Notes
- Teacher Conferences
- Word Bank

Unit Resources

Mr. Morgan's Math Help https://sites.google.com/view/mrmorgansmathhelp/illustrative-mathematics/math-6/unit-1-area-and-surface-area

Unit 5 Shared Google Drive

Illustrative Math YouTube Channel https://www.youtube.com/c/ChannelGRated/videos

Interdisciplinary Connections

Unit 5 Lesson 15

Visual Art - students construct open-top origami boxes

Engineering - creating and planning the construction of boxes