Unit # 4: Operations with Decimals

Content Area: **Mathematics**
Course(s): **College Prep Math 1**
Time Period: **November**
Length: **12 days**
Status: **Published**

Unit Overview

The unit begins with identification of the seven place values to the right of the ones place (or decimal point). Rounding decimals is then introduced. As the unit progresses, adding , subtracting , multiplying, and dividing decimals is covered. The differences between adding and subtracting decimals and multiplying and dividing decimals is clearly established. Applications of the above concepts are also dealt with in this unit.

Enduring Understandings

- Operations with decimals are incorporated in many real world applications.
- There are many occassions in life when converting fractions to decimals and vice versa is needed.

Essential Questions

- How are the operations of addition, subtraction, multiplication, and division of decimals the same ?
- How do the operations of addition, subtraction, multiplication, and division of decimals differ from each other ?
- How do the place values to the right of the decimal point differ from those to the left of the decimal point ?
- What methods can be used when converting a fraction to a decimal and vice versa ?
- When in my life will I need to be able to add, subtract, multiply or divide decimals ?

Standards / Indicators / Student Learning Objectives (SLOs):

- SWBAT add and subtract two or more decimals.
- SWBAT convert a common fraction to a decimal or repeating decimal.
- SWBAT convert a decimal to a common fracton.
- SWBAT convert a mixed number to a decimal.
- SWBAT divide a decimal by a power of 10.
- SWBAT divide a decimal by a whole number and by another decimal.
- SWBAT identify place value in a decimal fraction.

- SWBAT multiply decimal by a power of 10.
- SWBAT multiply two or more decimals.
- SWBAT round a decimal to any specified decimal place.
- SWBAT use addition and subtraction of decimals to solve application problems.
- SWBAT use multiplication and division to solve application problems.
- SWBAT write a decimal as a fraction or mixed number
- SWBAT write a number in decimal form and in words

MA.K-12.2	Reason abstractly and quantitatively. Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.
MA.K-12.4	Model with mathematics. Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.
MA.5.NBT.A	Understand the place value system.
MA.5.NBT.A.3	Read, write, and compare decimals to thousandths.
MA.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.
MA.5.NBT.A.4	Use place value understanding to round decimals to any place.
MA.5.NBT.B	Perform operations with multi-digit whole numbers and with decimals to hundredths.
MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Lesson Titles/Objectives

- Adding and subtracting decimals
- Converting between fractions and decimals
- Dividing decimals

- Multiplying decimals
- Place value and rounding

Career Readiness, Life Literacies & Key Skills

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.

Inter-Disciplinary Connections

LA.RH.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, qualitatively, as well as in words) in order to address a question or solve a problem.
LA.WHST.11-12.2.E	Provide a concluding paragraph or section that supports the argument presented.
SCI.HS-ESS1-4	Use mathematical or computational representations to predict the motion of orbiting objects in the solar system.
SCI.HS-PS4-1	Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.

Instructional Strategies, Learning Activities, and Blooms/DOK:

- Applications of decimals in real life
- Explanation , examples, and practice with adding decimals
- Explanation , examples, and practice with conversions between fractions and decimals
- Explanation , examples, and practice with decimal place value and rounding
- Explanation , examples, and practice with division of decimals
- Explanation , examples, and practice with multiplication of decimals
- Explanation , examples, and practice with subtraction of decimals
- Tutoring during Delsea One

Modifications

ELL Modifications

- 1:1 testing
- Assess ELL students continuously using formative assessment methods
- Use manipulatives where possible
- Use real objects when possible

IEP and 504 Modifications

- Providing study guides that don't lead the student to study too much extraneous information (less unnecessary details)/scaffolded study guides
- Allowing student to take notes in class for reinforcement but also providing a copy of completed/correct notes to study from
- Math tests could have formula's available on the test and/or sample problems
- Modeling and showing lots of examples

G & T Modifications

- Creation of technology-based assessments to address the higher levels of Bloom's
- Provide additional rigorous challenge problems for advanced students
- Specific career they are interested in? How would this apply to their interest?)
- Student led/directed discussions

At Risk Modifications :

- Guided notes
- Hands-on Instruction
- Modeling and showing lots of examples
- Review, restate, reword directions
- Study guides
- Tutoring during Delsea One
- Visuals

Formative Assessment

- Accuplacer practice problem
- Begin the homework assignment and periodically check answers together
- Class discussions
- Graded classwork
- Graded homework
- Guided practice
- Individual practice
- Oral questioning
- Oral response
- Teacher observation

- Warm up - "Check Yourself" problems on adding 2 or more decimals
- Warm up - "Check Yourself" problems on comparing the size of several decimals
- Warm up - "Check Yourself" problems on converting a common fraction to a decimal or repeating decimal
- Warm up - "Check Yourself" problems on converting a decimal to a common fraction
- Warm up - "Check Yourself" problems on converting a mixed number to a decimal
- Warm up - "Check Yourself" problems on dividing decimals by powers of 10
- Warm up - "Check Yourself" problems on identifying place value in a decimal fraction
- Warm up - "Check Yourself" problems on multiplying 2 or more decimals
- Warm up - "Check Yourself" problems on multiplying a decimal by a power of 10
- Warm up - "Check Yourself" problems on rounding decimals to specific decimal place values
- Warm up - "Check Yourself" problems on subtracting one decimal from another
- Warm up - "Check Yourself" problems on using addition and subtraction of decimals to solve application problems
- Warm up - "Check Yourself" problems on using division of decimals to solve application problems
- Warm up - "Check Yourself" problems on using multiplication of decimals to solve application problems
- Warm up - "Check Yourself" problems on Warm up - "Check Yourself" problems on dividing decimals by whole numbers and by another decimal
- Warm up - "Check Yourself" problems on writing decimals as fractions and mixed numbers
- Warm up - "Check Yourself" problems on writing decimals in words
- Warm up - "Check Yourself" problems on writing numbers in decimal form
- Written work

Summative Assessment

- Accuplacer Practice Test
- Accuplacer Test
- Quiz on place value, rounding decimals, converting between fractions and decimals, and adding, subtracting, and multiplying decimals - (sections 4 - 1 through 4 - 4)
- Unit Test on Operations with Decimals

Resources & Materials

- Check Yourself" warm up problems (see warm up section)
- Computer Generated Warm Ups (see formative assessment section for specific topics)
- Internet worksheets (see formative assessment section for specific topics)
- Teacher made worksheets (see formative assessment section for specific topics)
- Text: Basic Mathematical Skills with Geometry (2008)

Technology

- Chrome book
- Internet Sources: http://accuplacer.collegeboard.org/students
- Math XL
- Smart Board

TECH.8.1.12.A.CS2	Select and use applications effectively and productively.
TECH.8.1.12.D.CS2	Demonstrate personal responsibility for lifelong learning.