05_Fraction and Mixed-Number Computation; Measurement

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **5 Weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

In Grade 4, instructional time should focus on three critical areas:

1. Developing understanding and fluency with multi-digit multiplication, and developing an understanding of dividing to find quotients involving multi-digit dividends;
2. Developing an understanding of fraction equivalence, addition, and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers;
3. Understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Essential Questions:

- How can we visually represent and verify fractional computation?
- How can measurements be used to solve geometric problems?

Enduring Understandings:

Students will understand that:

- Fractions describe the relationship between the part and the whole, meaning, fractions do not provide the size of the whole or the size of the part.
- Decomposing fractions to unit fractions is a fundamental approach to being able to add and subtract fractions.
- Graphical representations of data are used to organize, convey, and interpret information.

STUDENT LEARNING TARGETS

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

Declarative Knowledge

Students will understand that:

- When a whole is partitioned into equal pieces, each one of those pieces is a fractional part of the whole.
- Decomposing fractions is one way to model parts of a whole and fractions can be decomposed in more than one way.
- Fractions can be written as an equation modeling the sum of unit fractions.
- Fractions describe the relationship between the part and the whole, meaning, fractions do not provide the size of the whole or the size of the part. (For example, one-half of a quart is not the same size as one-half of a cup.)
- Fraction models are used to solve simple fraction and mixed-number addition problems and contribute to developing strategies for solving addition problems involving fractions.
- Graphical representations of data (graphs, charts, line plots) are used to organize, convey, and interpret information.
- An angle's size depends on the spread of its rays.
- Angle measures can be expressed in terms of rotations or parts of rotations.
- A symmetric figure is one that can be divided into halves such that the two halves are mirror images of each other.

Procedural Knowledge

Students will be able to:

- Use unit fractions to decompose given fractions.
- Use manipulatives to find the whole.
- Solve fraction addition number stories.
- Add mixed numbers.
- Find an equivalent fraction in the tenths or hundredths.
- Divide an area and write a fraction addition equation to represent the partitioning.
- Solve fraction subtraction number stories.
- Subtract mixed numbers.
- Add and subtract fractions and mixed numbers.
- Describe the measure of angles based on the amount of rotation.
- Identify angles as acute, right, or obtuse.
- Estimate angles measures.
- Draw the matching half of a shape.
- Solve problems using single number models with a letter for the unknown.

CONTENT AREA STANDARDS

MA.4.MD.B.4	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.
MA.4.MD.C.5	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:
MA.4.MD.C.5a	An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.
MA.4.MD.C.5b	An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
MA.4.NF.B.3b	Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.
MA.4.NF.B.3c	Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
MA.4.NF.B.3d	Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
MA.4.NF.C.5	Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.
MA.4.NBT.B.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.

INTERDISCIPLINARY CONNECTIONS

Math in Music

- Understanding Music Note Values as Fractions

  Students will explore music note durations as fractions and tap out rhythms demonstrating whole, half and quarter notes.

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

CS.3-5.8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
LA.SL.4.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
LA.SL.4.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.
LA.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.SL.4.1.D	Review the key ideas expressed and explain their own ideas and understanding in light of

	the discussion.
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.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.
TECH.9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
TECH.9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
TECH.9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
TECH.9.4.2.IML.2	Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).
TECH.9.4.5.CT.4	Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).

EVIDENCE OF LEARNING

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

Formative Assessments

- Journal Pages
- Homelinks
- Math Boxes

Summative Assessments

- Unit 5 Progress Check

Benchmark Assessments

- IXL Screener / Diagnostic Snapshot BOY
- Trimester 1 Benchmark Assessment
- IXL Diagnostic Snapshot MOY
- Trimester 2 Benchmark Assessment
- IXL Diagnostic Snapshot EOY
- Trimester 3 Benchmark Assessment

RESOURCES (Instructional, Supplemental, Intervention Materials)

Core Instructional Materials:

- Everyday Math Unit 5 Resources (Math Masters, Student Journal Volume 2, ConnectED)
- Calendar Math

Supplemental Materials:

- IXL
- Illustrative Math Tasks
- Games
    - Multiplication Top-It, Advanced Version (Lesson 5-1): Multiplying 2-digit and 3-digit numbers by 1-digit numbers
    - Fraction Match (Lesson 5-2): Recognizing equivalent fractions
    - Decimal Top-It (Lesson 5-4): Making the largest decimal numbers
    - Multiplication Wrestling (Lesson 5-7): Multiplying 2-digit by 2-digit numbers
    - Fraction/Decimal Concentration (Lesson 5-8): Matching equivalent fraction and decimal cards
    - Fishing for Fractions, Addition (Lesson 5-10): Adding fractions
    - Fraction Top-It (Lesson 5-11): Comparing fractions
    - Fishing for Fractions, Subtraction (Lesson 5-13): Subtracting fractions
- Manipulatives
    - Base-10 blocks
    - Centimeter ruler
    - Fraction circles
    - Geometry Template
    - Number cards 0-9, 1-9 (4 of each)
    - One 10-sided die
    - Pattern blocks
    - Straws

Intervention Materials:

- Number Worlds
- Touch Math

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to the Accommodations & Modifications document in course folder.