06_Division; Angles

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:

- Is the result of my computation reasonable?
- What makes a computational strategy reasonable?
- How do operations affect numbers?
- How can algorithmic thinking be used to solve problems?
- ☐ How can two-dimensional relationships be described by careful use of geometric language?

Enduring Understandings:

Students will understand that:

- Flexible methods of division computation involve taking apart numbers in a variety of ways, using models and strategies such as arrays, open area models, and partial quotients.
- The remainder in a division problem represents a part, number, or quantity that is left over after executing the operation.
- Protractors are used to measure and construct angles.
- Angles and their measures can be added and subtracted.

STUDENT LEARNING TARGETS

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

Declarative Knowledge

Students will understand that:

- Division is a way of answering the question "How many [n]s are in m?"

- In some whole-number division problems, it may be desirable to express the remainder as a fraction or decimal.

- The remainder can be expressed in fraction form where the numerator is the whole number remainder and the denominator is the divisor; the answer to the division problem can be written as a mixed number by attaching the fraction to the quotient.

- Based on the context in a division number story, the remainder can be ignored, reported as a fraction, or used to round the quotient up.

- A protractor is a tool for measuring angles that is made up of small angles.

- When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. It is through this understanding that angles (and their measures) can be added and subtracted.

Procedural Knowledge

Students will be able to:

- Find extended division facts with 1-digit divisors.
- Solve area problems with unknown sides.
- Solve division number stories.
- Use multiples in partial-quotients division.
- Interpret remainders.
- Convert tons to pounds and pounds to ounces.
- Apply partial-quotients division.
- Divide 2-digit by 1-digit numbers.
- Measure angles
- Identify angles as acute or obtuse and measure angles.
- Use addition to find angle measures and compare angle measures.
- Solve fraction number stories.
- Multiply a fraction by a whole number.

CONTENT AREA STANDARDS

4.NF

A. Extend understanding of fractions equivalence and ordering

B. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers

C. Understand decimal notation for fractions and compare decimal fractions

4.M

A. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit

B. Geometric measurement: understand concepts of angle and measure angles

4.DL

A. Organize data and understand data visualizations

B. Represent and interpret measurement data

4.G

A. Draw and identify lines and angles, and classify shapes by properties of their lines and angles

MA.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.
MA.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.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.NF.B.3	Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.
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.MD.C.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified

	measure.
MA.4.MD.C.7	Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

INTERDISCIPLINARY CONNECTIONS

Architecture:

- Students will design blueprints of playhouses where they will measure and classify angles in the structures, calculate area of rooms using scale drawings and divide total into equal fractional spaces.

Nutrition:

- Students will divide recipe ingredient quantities when scaling down or up and convert between unit sizes.

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

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.
CS.3-5.8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
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.

Alternate Assessments

- Portfolios

- Verbal Assessment (instead of written)

- Multiple choice

- Modified Rubrics

- Performance Based Assessments

Formative Assessments

- Journal Pages
- Homelinks
- Math Boxes

Summative Assessments

- Unit 6 Progress Checks (1 & 2)

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 6 Resources
  - Math Masters
  - Student Journal Volume 2
  - [ConnectED](#)

Supplemental Materials:

- [IXL](#)
- Games
  - Divide and Conquer (Lesson 6-1): Finding and practicing extended division facts
  - Rugs and Fences (Lesson 6-2): Identifying unknown side lengths of the rectangles
  - Multiplication Wrestling (Lesson 6-2): Multiplying 2-digit by 2-digit numbers
  - Fishing for Fractions, Mixed-Number Subtraction (Lesson 6-3): Subtracting mixed numbers
  - Fraction Top-It (Lesson 6-6): Comparing fractions
  - Fraction Match (Lesson 6-7, 6-12): Identifying equivalent fractions
  - Division Dash (Lesson 6-8, 6-10): Dividing 2-digit dividends by 1-digit divisors
  - Angle Race (Lesson 6-9): Practicing angle measurement skills
  - Angle Add-Up (Lesson 6-11): Using addition and subtraction to find unknown angle measures
  - How Much More? (Lesson 6-11): Solving comparison number stories and recording multiplicative equations
  - Decimal Top-It (Lesson 6-13): Making the largest possible decimal numbers
- Manipulatives
  - Balance (or other scale)
  - 25 centimeter cubes per student
  - Centimeter ruler
  - Two 6-sided dice
  - 10-sided die labeled 0-9
  - Circular geoboard (1 per student partnership)
  - 40 counters per student
  - Cubes

  - Fraction circles

  - Geometry Template

  - Half-circle protractor

  - Number cards 1-8, 0-9, 1-9 (4 of each)

  - Rubber bands

  - Straws

  - Yardstick or meterstick

Intervention Materials:

- Number Worlds
- Touch Math Now

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.