09. Mathematical Practices

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **On-Going**
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

Students will understand that:

- Specific student behaviors, such as adaptive reasoning, strategic competence, conceptual understanding, procedural fluency, and productive disposition, can lead to greater mathematical success.

CONTENT AREA STANDARDS

4.OA

A. Use the four operations with whole numbers to solve problems

B. Gain familiarity with factors and multiples

C. Generate and analyze patterns

4.NBT

A. Generalize place value understanding for multi-digit whole numbers

B. Use place value understanding and properties of operations to perform multi-digit arithmetic

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

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
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.

INTERDISCIPLINARY CONNECTIONS

Students will apply the Standards for Mathematical Practice in the activities listed in the units through the following content areas:

- Music
- Art
- Social Studies
- Health/Nutrition
- Architecture

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.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.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
TECH.9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
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).

STUDENT LEARNING TARGETS

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

Declarative Knowledge

Students will understand that:

- Applying problem-solving steps and strategies based on the context can increase efficiency and accuracy while assisting with the development of conceptual understanding
- Applying mathematical tools based on the context can increase efficiency and accuracy while assisting with the development of conceptual understanding
- Mathematical modeling and varied representations of mathematical situations assist with the development of conceptual understanding

Procedural Knowledge

Students will be able to:

- Assess work for accuracy and completeness
- Deconceptualize and conceptualize given situations
- Analyze situations and justify conclusions
- Apply mathematical knowledge to find solutions to everyday problems
- Be sufficiently familiar with mathematical tools to make sound decisions about when each of them might be helpful
- Communicate precisely and carefully formulated mathematical explanations
- Discern a pattern or structure and extrapolate or interpolate
- Create general methods or condensed routines for repetitive calculations

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

- Open Response Tasks
- EDM Unit Assessments

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 / ConnectED

Supplemental Materials:

- Illustrative Math - Open-Response Tasks
- NJSLA Released Items
- IXL

Intervention Materials:

- Number Worlds
- Touch Math Now

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.