Grade 4 Unit 1: Place Value and Operations with Whole Numbers

Content Area: **Math**
Course(s): **Math Grade 4**
Time Period: **MP1**
Length: **45**
Status: **Published**

NJSLS Math

4.OA.A.2	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
4.OA.A.3	Solve multi-step 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.
4.NBT.A.1	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.
4.NBT.A.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
4.NBT.A.3	Use place value understanding to round multi-digit whole numbers to any place.
4.NBT.B.4	With accuracy and efficiency, add and subtract multi-digit whole numbers using the standard algorithm.
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.
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 model.

Unit Focus

- Generalize place value understanding for multi-digit whole numbers.
- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Standards for Math Practice

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.

Critical Knowledge & Skills

NJSLS Math	Suggested Math Practices	Critical Knowledge and Skills
4.NBT.A.2 (**M**) Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	MP.7 Look for and make use of structure.	Concepts: • Multiple representations of whole numbers exist. • Expanded form. • Base-ten numerals. Students will be able to: • Read and write multi-digit whole numbers using base-ten numerals. • Read and write multi-digit whole numbers using number names. • Read and write multi-digit whole numbers using expanded form. • Compare two multi-digit numbers using >, =, and < symbols. Learning Goal 1: • Compare two multi-digit whole numbers using >, =, and < for numbers presented as base ten numerals, number names, and/or in expanded form.
4.NBT.A.1 (**M**) Recognize that in a multi-digit whole number, a digit in one place represents ten times	MP.7 Look for and make use of structure.	Concepts: • A quantitative relationship

what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.		exists between the digits in place value positions of a multi-digit number. Students will be able to: • Explain that a digit in one place represents ten times what it would represent in the place to its right. Learning Goal 2: • For a whole numbers, explain that a digit in one place represents ten times what it would represent in the place to its right.
4.NBT.A.3 (**M**) Use place value understanding to round multi-digit whole numbers to any place.	MP.7 Look for and make use of structure.	Concepts: • Rounding Students will be able to: • Round multi-digit whole numbers to the nearest ten, hundred, and thousand. • Identify the place value of digits in a number and how it determines the rounding direction. Learning Goal 3: • Round multi-digit whole numbers to any place.
4.NBT.B.4 (**M**) With accuracy and efficiency, add and subtract multi-digit whole numbers using the standard algorithm.	MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concepts: • No new concepts introduced. Students will be able to: • Add multi-digit whole numbers using the standard algorithm with accuracy and efficiency.

		• Subtract multi-digit whole numbers using the standard algorithm with accuracy and efficiency. Learning Goal 4: • Add and subtract multi-digit whole numbers using the standard algorithm with accuracy and efficiency.
4.OA.A.3 (**M**) Solve multi-step 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.  Climate Change Example: Students may, knowing that energy and fuels are derived from natural resources and that their uses affect the climate, use the four operations to solve multi-step word problems posed with whole numbers, having whole-number answers and that are based on energy, fuels, and natural resources.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.7 Look for and make use of structure.	Concepts: • Proper use of the equal sign • Improper use of the equal sign (e.g. 3 + 7 = 10 – 5 = 5 is incorrect) Students will be able to: • Solve multi-step word problems involving any of the four operations. • Solve multi-step word problems involving interpretation (in context) of a remainder. • Write equations to represent multi-step word problems, using a letter to represent the unknown quantity. • Explain why an answer is reasonable. • Use mental computation and estimation strategies to determine whether an answer is reasonable. Learning Goal 5: • Write and solve each equation (including any of the four operations) in

		order to solve multi-step word problems, using a letter to represent the unknown; interpret remainders in context and assess the reasonableness of answers using mental computation with estimation strategies.
4.NBT.B.5 (**M**) 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.	MP.7 Look for and make use of structure.	Concepts: • No new concepts introduced. Students will be able to: • Multiply a whole number of up to four digits by a one-digit whole number using strategies based on place values. • Multiply two two-digit numbers using strategies based on place value. • Represent these operations with equations, rectangular arrays, and area models. • Explain the calculation by referring to the model (equation, array, or area model). Learning Goal 6: • Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers; represent and explain calculations using equations, rectangular arrays, and area models.
4.OA.A.2 (**M**) Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with	MP.1 Make sense of problems and persevere in solving them.	Concepts: • No new concepts

a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.	MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	introduced. Students will be able to: • Multiply to solve word problems involving multiplicative comparison. • Divide to solve word problems involving multiplicative comparison. • Represent problems with drawings and equations, using a symbol for the unknown number. • Distinguish word problems involving multiplicative comparison from those involving additive comparison. Learning Goal 7: • Multiply and divide to solve word problems involving multiplicative comparisons and represent these problems with drawings and equations.
4.NBT.B.6 (**M**) 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.	MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concepts: • No new concepts introduced. Students will be able to: • 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 the relationship between multiplication and division. • Represent these operations

		with equations, rectangular arrays, and area models. • Explain the calculation by referring to the model (equation, array, or area model). Learning Goal 8: • Divide a whole number of up to four-digits by a one-digit divisor; represent and explain the calculation using equations, rectangular arrays, and area models.

School/District Formative Assessment Plan

- Topic 1-1 through 1-5 Quick Check (found in Savvas Realize)
- Topic 2-1 through 2-8 Quick Check (found in Savvas Realize)
- Topic 3-1 through 3-8 Quick Check (found in Savvas Realize)
- Topic 4-1 through 4-7 Quick Check (found in Savvas Realize)
- Topic 5-1 through 5-10 Quick Check (found in Savvas Realize)

School/District Summative Assessment Plan

- Topic 1 Assessment
- Topic 2 Assessment
- Topic 3 Assessment
- Topic 4 Assessment
- Topic 5 Assessment

Benchmark & Alternative Assessments

- STAR Renaissance
- LinkIt Benchmarks
- Performance Tasks (found in Savvas Realize)

Focus Mathematical Concepts

Pre-requisite skills

- Represent a word problem using drawings and equations using a symbol for the unknown (2.NBT.A.1).
- A three-digit number is made up of hundreds, tens, and ones (2.NBT.A.1).
- The three digits of a three-digit number represent amounts of hundreds, amounts of tens, and amounts of ones (2.NBT.A.1).
- 100 is a bundle of ten tens called a “hundred” (2.NBT.A.1).
- The numbers 100, 200, 300, 400, 500, 600, 700, 800, and 900 refer to 1, 2, 3, 4, 5, 6, 7, 8, or 9 hundreds (and 0 tens and 0 ones) (2.NBT.A.1).
- Round whole numbers to the nearest 10 or 100, using place value understanding (3.NBT.A.1).
- Add within 1000 with accuracy and efficiency using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction (3.NBT.A.2).
- Subtract within 1000 with accuracy and efficiency using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction (3.NBT.A.2).
- Solve simple two-step word problems using the four operations (3.OA.D.8).
- Represent two-step word problems using equations with a letter standing for the unknown quantity (3.OA.D.8).
- Assess the reasonableness of answers in two-step word problems using mental computation and estimation strategies including rounding (3.OA.D.8).
- Multiply and divide within 100 using strategies such as the relationship between multiplication and division, or properties of operations (working towards accuracy and efficiency) (3.OA.C.7).

- Multiply and divide within 100 using strategies such as: relationship between multiplication and division or properties of operations (working towards accuracy and efficiency) (3.NBT.A.3).
- Use multiplication and division within 100 to solve word problems in situations involving: equal groups, arrays and measurement quantities (3.OA.A.3).
- Use drawings and equations with a symbol for the unknown number to represent multiplication and division word problems within 100 (3.OA.A.3).

Common Misconceptions

- Students may round to an incorrect place (Remind students to draw an arrow above the rounding place. Then, circle the place to the right and decide whether to round up or down.)
- Students may subtract the lesser number from the greater number regardless of the position. (Have students circle the digits where the bottom number is greater than the top number as a reminder that regrouping is needed.)

Number Fluency

- 4.NBT.B.4 Add and subtract within 1,000,000.

District/School Tasks

- Pick A Project (found in Savvas Realize)
- Performance Tasks (found in Savvas Realize)

District/School Primary, Supplemental and Intervention Resources

- Envisions by Savvas
- STAR Renaissance
- Connecting Math Concepts
- Corrective Math

Instructional Best Practices/Open Educational Resources

Illustrative Mathematics

Desmos

Numeracy Tasks

Building Thinking Classrooms Tasks

Open Middle Math Tasks

Resources from Dr. Eric Milou

Career Awareness, Life Literacies & Key Skills

9.1.5.CR.1	Compare various ways to give back and relate them to your strengths, interests, and other personal factors.
9.2.5.CAP.3	Identify qualifications needed to pursue traditional and non-traditional careers and occupations.
9.2.5.CAP.4	Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.
9.4.5.CT.1	Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2).
9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.
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).
9.4.5.IML.2	Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3).
9.4.5.IML.3	Represent the same data in multiple visual formats in order to tell a story about the data.
9.4.5.TL.2	Sort and filter data in a spreadsheet to analyze findings.

Computer Science & Design Thinking

8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
8.1.5.DA.2	Compare the amount of storage space required for different types of data.
8.1.5.DA.3	Organize and present collected data visually to communicate insights gained from different views of the data.
8.1.5.DA.4	Organize and present climate change data visually to highlight relationships or support a claim.
8.1.5.DA.5	Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Interdisciplinary Connections

4-PS3-4	Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.
W.WR.4.5	Conduct short research projects that use multiple reference sources (print and non-print) and build knowledge through investigation of different aspects of a topic.
W.SE.4.6	Gather relevant information from multiple print and digital sources; take notes, prioritize and categorize information; provide a list of sources.