Unit 1 - Number and Operations-Fractions, Number and Operations in Base Ten, Operations and Algebraic Thinking

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

Unit Overview

Enduring Understandings

Refine their problem-solving skills as they analyze givens and develop solution strategies.
Model real-world situations with a range of representations.
Use clear and precise language in their explanations and arguments.
Generalize after noticing patterns in operations.
Generalize the base-ten place-value structure, and explain that a digit in one place represents ten times the value of the digit in the place to its right.
Represent multi-digit whole numbers using forms such as standard, expanded, and word forms.
Compare two multi-digit numbers using place value and round multi-digit numbers to an appropriate place for the given estimation need.
Extend knowledge of estimation for addition and subtraction using rounding and front-end estimation.
Extend knowledge of previously learned strategies for adding and subtracting to include numbers up to 6-digits and learn to add and subtract using standard algorithms.
Compare quantities using multiplication and use multiplication equations to represent multiplicative comparison statements using the expression times as much as.
Compose additive and multiplicative comparison problems using bar diagrams and equations and identify multiplicative and additive comparisons with bar diagrams and equations using complete sentences.
Discuss multiplicative comparison word problems by using division and the word cost/costs

Essential Questions

What does it mean to do math?
How can I use place value to work with multi-digit numbers?
How can I add and subtract with strategies and algorithms?
How can I compare using multiplication?

Learning Objectives

Discuss their strengths in math and describe their math story.
Discuss approaches for understanding a problem and strategies for solving it and make sense of quantities in the problem and look for connections among quantities.

Consider different ways to use mathematics to represent a real-world situation.
Construct arguments to support their thinking and respond to the ideas and arguments of others.
Describe strategies for uncovering patterns and for using patterns to solve problems.
Discuss and decide on classroom norms of interaction for a productive math learning environment.
Relate the value of a digit in one place-value position to that of the same digit in the place to its right and determine the value of a digit in any place in a number.
Read and write numbers from 1 to 1,000,000 in standard form, word form, and expanded form.
Compare multi-digit numbers using place value and record comparisons using symbols.
Determine an estimate by rounding numbers to an appropriate place and round multi-digit numbers to any place.
Estimate sums and differences involving multi-digit numbers, and use their estimate to determine if their answer is reasonable.
Add multi-digit numbers by adjusting numbers or decomposing numbers based on place value.
Use and explain a standard addition algorithm without regrouping and with regrouping.
Subtract multi-digit numbers by adjusting or decomposing numbers based on place value.
Use and explain a standard subtraction algorithm without regrouping and with regrouping.
Solve multi-step problems with whole numbers by using representations such as bar diagrams and equations.
Solve multi-step problems involving addition and subtraction.
Represent multiplication as comparison and multiplicative statements as multiplication equations.

Standards: Content

4.OA.A	Use the four operations with whole numbers to solve problems
4.OA.A.1	Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
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.NBT.A	Generalize place value understanding for multi-digit whole numbers
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	Use place value understanding and properties of operations to perform multi-digit arithmetic
4.NBT.B.4	With accuracy and efficiency, add and subtract multi-digit whole numbers using the standard algorithm.

Standards: Interdisciplinary

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).

9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
9.2.5.CAP.6	Compare the characteristics of a successful entrepreneur with the traits of successful employees.
9.2.5.CAP.7	Identify factors to consider before starting a business.
9.1.2.PB.1	Determine various ways to save and places in the local community that help people save and accumulate money over time.
9.1.2.PB.2	Explain why an individual would choose to save money.
8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
8.1.5.DA.5	Propose cause and effect relationships, predict outcomes, or communicate ideas using data.
9.4.2.IML.2	Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).
9.4.2.IML.3	Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).
8.2.5.ED.2	Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
8.2.5.ED.3	Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.
8.2.5.ED.5	Describe how specifications and limitations impact the engineering design process.

Assessment Evidence

Formative	Collaborative Activities, Homework, Daily Classwork, Discussion, Independent Class Assignment, Informal Observations of Students, Games, Exit Slips, Questioning, Teacher Made Pages, Learning Centers, Problem of the Day, Reveal Workbooks, Fluency Checks, Curious, Activity Based Exploration, Guided Exploration, On My Own.
Summative	Tests, Mid-Chapter Checkpoint assessments, teacher generated assessments
Alternative & Benchmark	Alternative – Reteaching, One on One Conferencing, Learning Centers, student portfolio of assignments, Homework, Higher Order Thinking Problems, Additional leveled practice, orally administered assessments. Benchmark - LinkIt Benchmark Assessments, Totowa TPA
Assessment Evidence Resource	

Instructional Resources

Smartboard, Computers, websites and digital interactives/models, Multi-media presentations, video streaming, Brain Pop, Microsoft 365, Primary and Secondary Source Documents, Reveal Math Resources, manipulatives, post-it notes, markers, number lines, chart & graph paper, construction paper, glue, scissors, paperclips, crayons, envelopes, dot ink & cards, geo blocks, number cubes/dice.

Instructional Resource List

Curricular Mandates

Below are the curricular requirements as defined in NJ Administrative Code and Statute

	Amistad		Diversity, Equity, and Inclusion
	Holocaust		LGBT and Disabilities (Grades 6-12)
	Climate Change		Asian American & Pacific Islander

Social Emotional Learning (SEL) Competencies

NJ Social and Emotional Learning Competencies & Sub-Competencies

X	Self-Awareness	X	Relationship Skills
X	Responsible Decision-Making	X	Social Awareness
X	Self-Management		

21st Century Skills & Themes

	Global and Cultural Awareness	X	Technology Literacy		Planning and Budgeting
X	Creativity and Innovation		Financial Institutions		Risk Management and Insurance
	Information and Media Literacy		Digital Citizenship		Economic and Government Influences
X	Critical Thinking and Problem Solving		Credit Profile		Career Awareness and Planning
	Civic Financial Responsibility		Financial Psychology		