Unit 1: Place Value & Strategies for Multiplication and Division

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

NJSLS Math

MATH.5.NBT.A.1	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
MATH.5.NBT.A.2	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
MATH.5.NBT.A.3	Read, write, and compare decimals to thousandths.
MATH.5.NBT.A.3.a	Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).
MATH.5.NBT.A.3.b	Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
MATH.5.NBT.A.4	Use place value understanding to round decimals to any place.
MATH.5.NBT.B.5	With accuracy and efficiency, multiply multi-digit whole numbers using the standard algorithm.
MATH.5.NBT.B.6	Find whole-number quotients of whole numbers with up to four-digit dividends and two-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.
MATH.5.NBT.B.7	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Unit Focus

- Understand the place value system
- Perform operations with multi-digit whole numbers and with decimals to hundredths

Standards for Math Practice

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively

MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.K-12.8	Look for and express regularity in repeated reasoning

Critical Knowledge & Skills

NJSLS Math	Suggested Math Practices	Critical Knowledge and Skills
5.NBT.A.1 (M) Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): • Quantitative relationships exist 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 1/10 of what it would represent in the place to its left. • Explain that a digit in one place represents ten times what it would represent in the place to its right. Learning Goal 1: Explain that a digit in one place represents 1/10 of what it would represent in the place to its left and ten times what it would represent in the place to its right.
5.NBT.A.2 (M) Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): • Scientific notation and exponents Students will be able to: • Explain patterns in the number of zeros of the product when multiplying a whole number by powers of 10. • Explain patterns in the

		placement of the decimal point when a decimal is multiplied or divided by a power of 10. • Write powers of 10 using whole-number exponents. Learning Goal 2: Explain patterns in the number of zeros in the product when a whole number is multiplied by a power of 10; represent powers of 10 using whole-number exponents.
5.NBT.A.3 (M) Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 x 100 + 4 x 10 + 7 x 1 + 3 x 1/10 + 9 x 1/100 + 2 x 1x1000. b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): Multiple representations of numbers Students will be able to: • Read decimals to thousandths using base-ten numerals, number names, and expanded form. • Write decimals to thousandths using base-ten numerals, number names, and expanded form. • Compare two decimals to thousandths using >, =, and < symbols. • Compare decimals when each is presented in a different form (base-ten numeral, number name, and expanded form). Learning Goal 3: Compare two decimals to thousandths using >, =, and < for numbers presented as base ten numerals, number names, and/or in expanded form.

5.NBT.A.4 (M) Use place value understanding to round decimals to any place.	MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): No new concept(s) introduced Students will be able to: • Round decimals to any place using place value understanding Learning Goal 4: Round decimals to any place value.
5.NBT.B.5 (M) With accuracy and efficiency, multiply multi-digit whole numbers using the standard algorithm.	MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): No new concept(s) introduced Students will be able to: • Multiply multi-digit whole numbers using the standard algorithm working towards accuracy and efficiency. Learning Goal 5: Use the standard algorithm to multiply a whole number of up to a four digits by a whole number of up two digits.
5.NBT.B.6 (M) Find whole-number quotients of whole numbers with up to four-digit dividends and two-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.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	Concept(s): No new concept(s) introduced Students will be able to: • Find whole-number quotients with up to four-digit dividends and twodigit divisors using strategies based on place value. • Find whole-number quotients with up to four-digit dividends and two-digit divisors using strategies based on

	MP.7 Look for and make use of structure.	properties of operations or the relationship between multiplication and division. • Illustrate and explain the division calculation by using equations, rectangular arrays, and/or area models. Learning Goal 6: Calculate whole number quotients of whole numbers with 4-digit dividends and 2-digit divisors; explain and represent calculations with equations, rectangular arrays, and area models.
5.NBT.B.7 (M) Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.	Concept(s): No new concept(s) introduced Students will be able to: • Multiply decimals to hundredths using models or drawings. • Multiply decimals to hundredths using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. • Relate the strategy to the concrete model or drawing, and explain the reasoning used. Learning Goal 7: Add, subtract, multiply, and divide decimals to hundredths using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; explain the reasoning used, relating the strategy to the written method.

School/District Formative Assessment Plan

- Topic 1-1 through 1-7 Quick Check (found in Savvas Realize)
- Topic 2-1 through 2-6 Quick Check (found in Savvas Realize)
- Topic 3-1 through 3-9 Quick Check (found in Savvas Realize)
- Topic 4-1 through 4-9 Quick Check (found in Savvas Realize)
- Topic 5-1 through 5-8 Quick Check (found in Savvas Realize)
- Topic 6-1 through 6-6 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
- Topic 6 Assessment

Focus Mathematical Concepts

Pre-requisite skills:

- Recognize that a digit represents 10 times the value of what it represents in the place value to its right (4.NBT.A.1).
- Read and write multi digit whole numbers in base-ten numerals, word, and expanded form (4.NBT.A.2).
- Use decimal notation for fractions with denominators 10 or 100 (4.NF.C.6).
- compare two decimals to hundredths by reasoning about their size (4.NF.C.7).

- Record the results of comparisons with the symbols >, =, or < (4.NF.C.7).
- Round multi-digit numbers to any place using place value understanding (4.NBT.A.3).
- Multiply up to four-digit by one-digit numbers using strategies based on place value and properties of operations (4.NBT.B.5).
- Multiply two two-digit numbers using strategies based on place value and properties of operations (4.NBT.B.5).
- Add multi-digit whole numbers using the standard algorithm (4.NBT.B.4).
- Subtract multi-digit whole numbers using the standard algorithm (4.NBT.B.4).
- Add within 1000 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 using strategies and algorithms based on place value,properties of operations, and/or the relationship between addition and subtraction (3.NBT.A.2).

Common Misconceptions:

- Students think that as you move to the left of the decimal point, the number increases in value. Reinforcing the concept of powers of ten is essential for addressing this issue.
- Students think that the longer the number the greater the number.
- Students might compute the sum or difference of decimals by lining up the right-hand digits as they would the whole number.

Number Fluency:

- 5.NBT.B.5 Multiply multi-digit whole numbers using the standard algorithm.

District/School Tasks

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

District/School Primary and Supplementary Resources

- Envisions by Savvas
- STAR Renaissance

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, Exploration, Preparation, and Training

WRK.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.

Life Literacies & Key Skills

TECH.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).
TECH.9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.
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).
TECH.9.4.5.TL.2	Sort and filter data in a spreadsheet to analyze findings.
TECH.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).
TECH.9.4.5.IML.3	Represent the same data in multiple visual formats in order to tell a story about the data.

Interdisciplinary Connections

SCI.5-PS1-1	Develop a model to describe that matter is made of particles too small to be seen.
ELA.RI.CR.5.1	Quote accurately from an informational text when explaining what the text says explicitly and make relevant connections when drawing inferences from the text.
ELA.RI.MF.5.6	Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs,

	diagrams, timelines, animations, or interactive elements on web pages) and explain how the information contributes to an understanding of the text in which it appears.
ELA.RI.AA.5.7	Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).
ELA.RI.CT.5.8	Compare and contrast the authors' approaches across two or more informational texts within the same genre or about texts on the same or similar topics.
ELA.W.AW.5.1	Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
ELA.W.WR.5.5	Establish a central idea about a topic, investigation, issue or event and use several sources to support the proposed central idea.
SCI.5-ESS1-1	Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.