GRADE 3 UNIT 1 – REPRESENT AND SOLVE PROBLEMS INVOLOVING MULTIPLICATION AND DIVISION

Established Goals:
Standards

Operations and Algebraic Thinking

3.3.OA.1: Interpret products of whole numbers.

3.3.OA.2: Interpret whole-number quotients of whole numbers.

3.3.OA: Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.

Numbers and Base Ten

3.3.NBT.1: Use place value understanding to round whole numbers to the nearest 10 or 100.

3.3.NBT.2: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

3.3.NBT.3: Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

Transfer

Students will be able to:

Apply the meaning of multiplication and division to solve problems in a variety of situations including measurement.

Use place value strategies and number sense to solve real world problems.

Meaning

ENDURING UNDERSTANDING	ESSENTIAL QUESTIONS
• There are various strategies that can be used to solve problems involving multiplication and division. • Place Value Strategies can be used to solve problems involving multi-digit arithmetic • Rounding is a process for finding multiples of 10 and 100. • Multiplication can be used to solve real world measurement problems involving area.	• How are addition and multiplication related? • How do I decide which strategy to use to solve problems? • How can rounding be used to estimate sums and differences?

Acquisition

KNOWLEDGE	SKILLS
Students will know how to…	*Students will be skilled at…*
• Know the value of digits up to 1,000 • Round to the nearest 10 and 100 • Use place value to add and subtract • Add and subtract with and without regrouping • How to construct arrays • Use Repeated Addition • Organize and share equal groups	• Fluently add and subtract basic facts • Read and write numbers in a variety of ways • Use algorithms and place value strategies to add and subtract with and without regrouping • Estimate Sums and Differences • Round to the nearest ten and hundred • Know how to connect repeated addition to multiplication • Demonstrate/explain meanings of multiplication and division through pictures, arrays, vocabulary, repeated addition or subtraction • Fluently multiply by 0, 1, 2, 5, and 10. • Relate repeated addition to multiplication

	• Solve and write multiplication and division equations • Multiply by multiples of 10 (10 X 8) • Use N = Unknown in equations • Create simple multiplication and division word problems • Area is the total square units of a given shape • Area is measured in square units • Multiplication can be used to solve problems involving area • Apply vocabulary	equations • How to choose the correct operation to solve word problems involving any of the four operations • Write multiplication and division equations to solve problems • Determine the are of a figure by counting square units • Demonstrate how rows and columns in arrays can be used to determine area

Vocabulary	Instruction and Pacing (suggested order to teach)	
Digits Compare Round Greater Than Less Than Fact Family Sum Difference Factors Product Groups Addend Multiplication Multiples Array Equal Equation Division Sharing Equal Groups Addends Order Solve Word Problem Commutative Property of Multiplication Area Expression Columns Rows Determine	**PreTest (optional)**	**1 Day**
	Place Value	**2 Weeks**
	Addition of Multi-Digit Numbers	**1 Week**
	Subtraction of Multi-Digit Numbers	**1 Week**
	Meaning of Multiplication	**1 ½ Week**
	Meaning of Division	**1 ½ Week**
	Review and Benchmark Testing	**4 days**

Square centimeter Square Inch Square Foot Measurement		

Resources

Common Cored StandardsNew Jersey Model Curriculum

Envisions Math Program Suggested Topics

Topic 1 Numeration

Topic 2 Number Sense & Add/Sub.

Topic 3 Place Value & Add/Sub.

Topic 4 & 7 (Selected Lessons)

Topic 14 (Only Selected Area Lessons)

MANIPULATIVES & GRAPHIC ORGANIZERS FOR UNIT 1 – Place Value Blocks, Place Value Mats/Charts, Number Lines (rounding), Graph Paper (arrays & area models), Counting Cubes (to create arrays), Communicator/Smart Pal Sleeve Templates related to Place Value and Arrays

http://illuminations.nctm.org, https://www.illustrativemathematics.org

http://pearsonrealize.com http://prodigygame.com

Differentiation and Accommodations

(options)

Provide graphic organizers
Provide additional examples and opportunities for additional problems for repetition
Provide tutoring opportunities
Provide retesting opportunities after remediation (up to teacher and district discretion)
Teach for mastery not test
Teaching concepts in different modalities
Adjust pace and homework assignments

Additional Resources for ELL Learners

Envisions Spanish Version Digital Path & Printable Resources
Problem Solving worksheet
http://media.pearsoncmg.com/curriculum/math/envision2012/pdf/cc4_tt_1.pdf

Number sense and Place Value Unit
http://www.njctl.org/courses/math/3rd-grade-math/place-value/
https://www.smartboardexchange.com

Multiplication Units
http://www.njctl.org/courses/math/3rd-grade-math/multiplication/
Division Unit
http://www.njctl.org/courses/math/3rd-grade-math/division/

ELL Modifications

- Beginners- focus on one place value at a time start with hundredths and build
- Explain orally and in writing that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right using L1 and/or gestures, examples and selected technical words
- Use a number word chart in English and Spanish
- Use sentence frames with problem solving and place value leaving number words or numbers out
  3,345= three ____ , three hundred forty-five
  3,345= 3,000 + 300 +___ + ____
- Use manipulatives- place value blocks and money to show numbers
- Act out word problems
- Total physical response- students physically represent numbers with cards
- Teach Mnemonic/jingle for rounding and use a number line
- ELL scaffolding for Unit 1 3rd grade http://www.state.nj.us/education/modelcurriculum/math/ellscaffolding/revised/3u1.pdf

21st Century Skills	Critical Thinking, Creative Thinking, Collaborating, Communicating, and Technology Literacy
Instructional Strategies	Fairfield Township School recognizes the importance of the varying methodologies that may be successfully employed by teachers within the classroom and, as a result, identifies a wide variety of possible instructional strategies that may be used effectively to support student achievement. These may include, but not be limited to, strategies that fall into categories identified by the Framework for Teaching by Charlotte Danielson: • Communicating with students • Using questioning and discussion techniques • Engaging students in learning • Using assessment in instruction • Demonstrating Flexibility and Responsiveness
Interdisciplinary Connections	ELA, Science, and Technology

Common Misconceptions	Proper Conceptions
Students have difficulty changing from expanded form to standard form	Arrange numbers vertically and add them together
Students will look at a number and say it incorrectly	Using place value holders and commas help us read larger numbers correctly
Students have difficulty visualizing the representation of larger numbers	Place Value Blocks help us to see and visualize large numbers
Students confuse the greater and less than sign when comparing numbers	Practice saying and using greater and less than signs helps us compare numbers
Students have difficulty rounding larger numbers to the ten or hundred	Using a number line shows where the numbers are closer to
Students are not sure when to regroup	Using place value blocks and cubes can help us to see when to regroup
Students are not sure how to record the new numbers once they regroup	Connecting place value blocks and cubes show the connection to the written number
Students add or subtract in the hundreds or thousands column first	Steps to adding and subtracting 2 and 3 digit numbers start in the ones column
Students confuse rows and columns in arrays	Columns are up and down. Rows go across

Students incorrectly draw arrays for the given groups	Arrays are equal groups of rows and columns. Graph paper can help us to organize rows and columns.
Students reverse the numbers when recording the number of rows and columns	The # of rows is the first number in the equations the # in each row is the second

Performance Task (optional)

Your family has just developed 24 photos from your vacation. They want you to organize the photos into an arrangement of equal rows and columns for a family poster. Draw a plan that shows 2 different ways to organize your photos. Choose one of your plans and write the repeated addition equation, and the related multiplication equation. Explain how your drawing relates to multiplication.

Rubric

3 – Student will be able to demonstrate/draw two arrays to display the family photos into equal groups. (e.g. 4 rows of 6 and 8 rows of 3). Student will write a repeated addition equation for one of the arrays and the related multiplication equation. Student clearly explains their answer in a sentence, in a series of steps or labels their drawings and equations.

2 – Student will demonstrate/draw at least one correct array with the correct repeated addition sentence and related multiplication fact with some explanation.

1 – Student will demonstrate/draw one or two ways to organize photos into equal groups/arrays, excluding repeated addition or multiplication equations, or writes incorrect equations.

0 – Student shows little or no evidence of organizing photos

ASSESSMENTS

Suggested Formative Assessment (options)

Problem of the Day

Lesson Quizzes

Exit Ticket

Anecdotal Records (Topic Observation Checklist)

Suggested Summative Assessment (optional) - Grade Level developed Unit/Envisions Topic Tests/ Ed Connect Tests/ State Unit Benchmark/Performance Task