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**New York State Assessment
Mathematics
Grade 3**

This sample includes the following:

Teacher's Guide pages (8 pages)

- Cover and Table of Contents
- Pacing Plan
- Teacher Notes page
- PLD Correlations pages

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Grade

3

New York State Assessment



Teacher's Guide

Preparing for Next Generation Success in

Mathematics

Table of Contents

Introduction	4
Next Generation Standards Success	4
What the Research Says	5
Practice Tests	5
Supporting All Learners	6
Small-Group Instruction	6
Multi-Language Learners	6
Students with Diverse Abilities	6
How to Use This Resource	7
Pacing Plan	9
Teacher Notes	10
Understanding Multiplication & Understanding Division (3.OA.1 & 3.OA.2)	10
Two-Step Multiplication and Division Problems & Finding the Unknown (3.OA.3 & 3.OA.4)	11
Properties of Multiplication and Division & Solving Division with Multiplication (3.OA.5 & 3.OA.6)	12
Solving Two-Step Word Problems & Assessing the Reasonableness of Answers (3.OA.8a & 3.OA.8b)	13
Finding Numeric Patterns & Rounding Numbers (3.OA.9 & 3.NBT.1)	14
Multiplying by Multiples of 10 & Place Value (3.NBT.3 & 3.NBT.4a)	15
Numbers in Expanded Form & Unit Fractions (3.NBT.4b & 3.NF.1)	16
Unit Fractions on Number Lines & Bigger Fractions on Number Lines (3.NF.2a & 3.NF.2b)	17
Equivalent Fractions & Making Equivalent Fractions (3.NF.3a & 3.NF.3b)	18
Whole Numbers as Fractions & Comparing Fractions (3.NF.3c & 3.NF.3d)	19
Adding and Subtracting Time & Mass and Liquid Volume (3.MD.1 & 3.MD.2a)	20
Liquid Volume and Mass Word Problems & Comparing Data (3.MD.2b & 3.MD.3)	21
Measuring Length & Line Plots (3.MD.4)	22
Unit Squares & Area Measurement in Square Units (3.MD.5a & 3.MD.5b)	23
Area Problems & Multiplying to Find Area (3.MD.6 & 3.MD.7a)	24
Finding and Making Rectangular Areas & Area and the Distributive Property (3.MD.7b & 3.MD.7c)	25
Area of Irregular Shapes & Perimeter Problems (3.MD.7d & 3.MD.8a)	26
Area and Perimeter & Classifying Shapes (3.MD.8b & 3.G.1)	27
Partitioning Shapes (3.G.2)	28
References Cited	29
Appendix	30
Performance Level Description Correlations	30
Practice Test Answer Keys and Correlations	34
Practice Test Bubble Sheets	36
Practice Page Bubble Sheets	38

Pacing Plan

The following eight-week pacing plan is designed to provide students with standards-based mathematics practice every day. Lessons in the student book appear in this order. You should customize this pacing plan according to students' needs. Prepare your students in only 30 minutes a day.

	Day 1	Day 2	Day 3	Day 4	Day 5
Operations and Number Sense	Understanding Multiplication (3.OA.1)	Understanding Division (3.OA.2)	Two-Step Multiplication and Division Problems (3.OA.3)	Finding the Unknown (3.OA.4)	Properties of Multiplication and Division (3.OA.5)
Number Sense and Base Ten	Solving Division with Multiplication (3.OA.6)	Solving Two-Step Word Problems (3.OA.8a)	Assessing the Reasonableness of Answers (3.OA.8b)	Finding Numeric Patterns (3.OA.9)	Rounding Numbers (3.NBT.1)
Base Ten and Fractions	Multiplying by Multiples of 10 (3.NBT.3)	Place Value (3.NBT.4a)	Numbers in Expanded Form (3.NBT.4b)	Unit Fractions (3.NF.1)	Unit Fractions on Number Lines (3.NF.2a)
Fractions	Bigger Fractions on Number Lines (3.NF.2b)	Equivalent Fractions (3.NF.3a)	Making Equivalent Fractions (3.NF.3b)	Whole Numbers as Fractions (3.NF.3c)	Comparing Fractions (3.NF.3d)
Measurement	Adding and Subtracting Time (3.MD.1)	Mass and Liquid Volume (3.MD.2a)	Liquid Volume and Mass Word Problems (3.MD.2b)	Comparing Data (3.MD.3)	Measuring Length and Line Plots (3.MD.4)
Measuring Area	Unit Squares (3.MD.5a)	Area Measurement in Square Units (3.MD.5b)	Area Problems (3.MD.6)	Multiplying to Find Area (3.MD.7a)	Finding and Making Rectangular Areas (3.MD.7b)
Measuring Shapes	Area and the Distributive Property (3.MD.7c)	Area of Irregular Shapes (3.MD.7d)	Perimeter Problems (3.MD.8a)	Area and Perimeter (3.MD.8b)	Classifying and Partitioning Shapes (3.G.1) (3.G.2)
Practice Tests	Test 1	Test 1 Review	Test 2	Test 2 Review	Celebration

Two-Step Multiplication and Division Problems

This lesson guides students as they work on pages 10–11



Teacher Tip

Remind students they can represent multiplication and division with arrays, equal groups, and number lines. Discuss how each type of model can be used for multiplication or division.

Explain the word problem. Guide students to determine what information they need to know. Invite them to share what they will solve first and second.

Let's Practice!

Solving a Two-Step Problem
A class is setting up chairs for a play. Right now, the chairs are in 3 rows with 8 chairs in each row. Mr. G wants the students to rearrange the chairs so there are 6 chairs in each row. How many rows of chairs will there be?

Step 1

What do you need to find out first? You need to know how many chairs there are. You can use an array to model 3 rows of 8 chairs. You can see from the array that $3 \times 8 = 24$. There are 24 chairs.

Step 2

What do you need to do next? What equations do you need to solve now?
 $24 \div 6 = \underline{\quad}$ or $\underline{\quad} \times 6 = 24$

You can make 4 or groups of 6.
 $24 \div 6 = 4$ and $6 \times 4 = 24$
 Answer: 4 rows

What are you being asked to do? Draw a circle around the most important words.

You can write a division problem or a multiplication problem. What model will you use?

You can use a number line to find how many rows, or groups, of 6 you can make. How many groups do you see?

Discuss with students other ways they could draw or model the second part of this problem, other than with a number line. Ask students to share which models they prefer.



Answers for page 11—1. A; 2. C; 3. B; 4. A; 5. C; 6. D

Finding the Unknown

This lesson guides students as they work on pages 12–13



Teacher Tip

Remind students of the parts of multiplication and division problems. Model and discuss the relationship between multiplication and division with a few fact families (e.g., $2 \times 5 = 10$, $5 \times 2 = 10$, $10 \div 2 = 5$, $10 \div 5 = 2$).

Explain each step of the first example. Have students apply this to solve the following equations:
 $4 \times ? = 12$; $2 \times ? = 20$; $? \times 8 = 64$

Let's Practice!

Find the Unknown

Example 1
Find the unknown in the equation.
 $3 \times \underline{\quad} = 33$
 How can you think about the problem? You can think, "3 groups of some number is the same as 33." You can think, "3 times some number is the same as 33."
 The missing factor is 11 because 3 times 11 equals 33.

Example 2
You have 36 apples. You place them into bags. Each bag has 9 apples in it. How many bags did you use? Use the equation to solve the problem.
 $36 \div \underline{\quad} = 9$
 First, think about what the unknown is in the problem. It is the number of bags, or the number of equal groups.
 $\underline{\quad} \times 9 = 36$
 You can rewrite it as a multiplication problem. How many groups of 9 is the same as 36? 4 groups of 9 equals 36, so 6 equals 4.
 You used 4 bags.

What are you being asked to do? Draw a circle around the most important words.

What is unknown in this equation? There is an unknown factor.

What are you being asked to do? What strategies will you use?

What is unknown in this equation? There is an unknown factor.

Discuss the word problem and equation with students. Invite them to draw their own visual representations to help them solve either of the division problems.



Answers for page 13—1. C; 2. A; 3. D; 4. A; 5. A; 6. B; 7. D; 8. C

Performance Level Description Correlations

Each lesson strategy corresponds with a Performance Level Description (PLD) as outlined by the NYSED. The strategies in each lesson are written to align with the highest PLD for each standard.

Lesson Title	Standard	Performance Level Description
Understanding Multiplication	3.OA.1	Interpret products and quotients of whole numbers in real-world problems.
Understanding Division	3.OA.2	Interpret products and quotients of whole numbers in real-world problems.
Two-Step Multiplication and Division Problems	3.OA.3	Use multiplication and division to solve two-step word problems involving one- or two-digit numbers, equal groups, arrays, and measurement quantities other than area. Determine the unknown whole number in multiplication or division equations in real-world problems.
Finding the Unknown	3.OA.4	Determine the unknown whole number in multiplication or division equations in real-world problems.
Properties of Multiplication and Division	3.OA.5	Explain how the properties of operations (commutative, associative, distributive) can be utilized as strategies to multiply and divide.
Solving Division with Multiplication	3.OA.6	Use the relationship between multiplication and division to explain how to use multiplication to solve a division problem or use division to solve a multiplication problem involving factors less than 10.
Solving Two-Step Word Problems	3.OA.8a	Represent or solve two-step word problems using any two of the four operations with a letter standing for the unknown, the unknown is in a variety of positions, and involving factors greater than or equal to 10.
Assessing the Reasonableness of Answers	3.OA.8b	Access and explain the reasonableness of answers using mental computation and estimation strategies including rounding in a two-step word problem involving factors greater than or equal to 10.
Finding Numeric Patterns	3.OA.9	Apply arithmetic patterns and explain how the properties of the arithmetic pattern can lead to generalizations that can be used to solve mathematical and real-world word problems.
Rounding Numbers	3.NBT.1	Use place value understanding to round four- or five-digit whole numbers to the nearest 10, 100, or 1,000.
Multiplying by Multiples of 10	3.NBT.3	Use the properties of operations (associative or distributive property) to explain the patterns in multiplication when multiplying by multiples of 10.

Performance Level Description Correlations *(cont.)*

Lesson Title	Standard	Performance Level Description
Place Value	3.NBT.4a	Understand that the digits of a five-digit number represent amounts of ten thousands, thousands, hundreds, tens, and ones, identify place value, and know that a group of ten thousands is equal to 10,000.
Numbers in Expanded Form	3.NBT.4b	Read and write five-digit numbers using base-ten numerals, number names, and expanded form.
Unit Fractions	3.NF.1	Apply and explain the construct of a unit fraction, $\frac{1}{b}$, as the quantity formed by 1 part when a whole is partitioned into b equal parts or the construct $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$ (any denominator up to 10).
Unit Fractions on Number Lines	3.NF.2a	Represent a fraction $\frac{1}{b}$ on a number line from 0 to 1 and partitioned into b equal parts and recognize that each part has size of $\frac{1}{b}$ based on starting at 0 and that b in $\frac{1}{b}$ is the total number of equal parts in the whole.
Bigger Fractions on Number Lines	3.NF.2b	Represent $\frac{a}{b}$ on a number line from 0 to 1 by marking off a length of $\frac{1}{b}$ and recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line.
Equivalent Fractions	3.NF.3a	Understand two fractions as equivalent if they are the same size or the same point on a number line.
Making Equivalent Fractions	3.NF.3b	Recognize and generate equivalent fractions with denominators of 2, 3, 4, 6, and/or 8.
Whole Numbers as Fractions	3.NF.3c	Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers.
Comparing Fractions	3.NF.3d	Compare two fractions with the same numerator or same denominator using the symbols $>$, $<$, or $=$ and recognize that the fractions must refer to the same whole and justify the conclusions.
Adding and Subtracting Time	3.MD.1	Read, write, or measure time intervals in minutes and solve two-step word problems involving addition or subtraction of time intervals in minutes, including crossing into a new hour or going from a.m. to p.m.

Performance Level Description Correlations *(cont.)*

Lesson Title	Standard	Performance Level Description
Mass and Liquid Volume	3.MD.2a	Measure or estimate liquid volumes and masses of objects using standard units of liters (l), grams (g), and kilograms (kg) with or without the use of a model.
Liquid Volume and Mass Word Problems	3.MD.2b	Add, subtract, multiply, or divide to solve two-step word problems involving masses or volumes that are given in the same units, and assess or explain the solution using estimation.
Comparing Data	3.MD.3	Draw or interpret a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve multistep problems comparing more than two categories of data presented in a scaled picture graph or a scaled bar graph.
Measuring Length	3.MD.4	Generate measurement data by measuring lengths to the nearest eighth of an inch using rulers marked with halves, fourths, and eighths of an inch.
Line Plots	3.MD.4	Show the data by making or using a line plot where the horizontal scale is marked off in appropriate units (whole numbers, halves, quarters, or eighths).
Unit Squares	3.MD.5a	Recognize area as an attribute of plane figures, and understand that area is measured in square units and can be found by covering a plane figure with unit squares, without gaps or overlaps, and counting them.
Area Measurement in Square Units	3.MD.5b	Understand that a plane figure that can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.
Area Problems	3.MD.6	Solve real-world problems involving finding the area of plane figures or comparing the areas of two or more figures using unit squares to cover the figures without gaps or overlaps.
Multiplying to Find Area	3.MD.7a	Explain why the number of unit squares covering a rectangle is equivalent to multiplying its whole number side lengths.
Finding and Making Rectangular Areas	3.MD.7b	Create real-world or mathematical problems that involve finding the area of rectangles by multiplying whole number side lengths and represent whole number products as rectangular areas in mathematical reasoning.

Performance Level Description Correlations *(cont.)*

Lesson Title	Standard	Performance Level Description
Area and the Distributive Property	3.MD.7c	Use area models to represent various ways the distributive property can be used in mathematical reasoning and apply this technique to solve real-world area problems that may include more than one unknown side.
Area of Irregular Shapes	3.MD.7d	Recognize area as additive. Find areas of figures composed of non-overlapping rectangles and apply this technique to solve real-world problems that include more than one unknown side length.
Perimeter Problems	3.MD.8a	Solve mathematical or real-world problems involving the perimeters of two different polygons given most of the side lengths in each figure.
Area and Perimeter	3.MD.8b	Identify rectangles with the same perimeter and different areas or with the same area and different perimeters.
Classifying Shapes	3.G.1	Recognize and classify regular and irregular polygons based on the number of sides and vertices and identify shapes that do not belong to one of the given subcategories using the formal terms “regular” and “irregular.”
Partitioning Shapes	3.G.2	Create and partition shapes into parts with equal areas and express the area of each part as a unit fraction of the whole.