# Contents

Acknowledgments

Continental Press

Answer Key

Unit 1 Understanding Multiplication and Division

Lesson 1 *Meaning of Multiplication* pp. 8–11

1. C   [3.OA.1]
2. C   [3.OA.1]
3. B   [3.OA.1]
4. A   [3.OA.1]
5. B   [3.OA.1]
6. D   [3.OA.1]
7. Constructed response   [3.OA.1]
   No. *Explanations may vary but should say something like the following:* The groups are not equal because there are three 6's and one 4. You can only multiply when all the groups are equal.
8. Constructed response   [3.OA.1]
   $6 \times 9 = 54$
9. Constructed response   [3.OA.1]
   No. *Explanations may vary but should say something like the following:* There are 5 equal groups of 7 triangles, not 5 equal groups of 5 triangles. So you need to add 7 five times or multiply 7 and 5: $7 + 7 + 7 + 7 + 7 = 35$ or $5 \times 7 = 35$.
10. Extended response   [3.OA.1]
    Part A: *Arrays may vary but should look something like the following:*

    Emilio   Kara
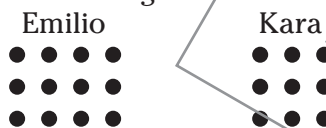
    Emilio: $3 \times 4 = 12$; *Kara:* $4 \times 3 = 12$
    Part B: *Explanations may vary but should say something like the following:* The factors and products are the same. The only difference is the order of the factors. It does not matter what order the factors are in. The product will be the same. This means that the product of 3×4 is the same as 4×3.

Lesson 2 *Meaning of Division* pp. 12–15

1. A   [3.OA.2]
2. D   [3.OA.2]
3. C   [3.OA.2]
4. B   [3.OA.2]
5. B   [3.OA.2]
6. D   [3.OA.2]
7. Constructed response   [3.OA.2]
   $36 - 9 = 27, 27 - 9 = 18, 18 - 9 = 9, 9 - 9 = 0$
   $36 \div 9 = 4$
8. Constructed response   [3.OA.2]
   No. *Explanations may vary but should say something like the following:* Subtract 5 from 42: $42 - 5 = 37, 37 - 5 = 32, 32 - 5 = 27,$ $27 - 5 = 22, 22 - 5 = 17, 17 - 5 = 12,$ $12 - 5 = 7, 7 - 5 = 2.$ You cannot subtract 5 from 2 to get 0. So you cannot divide 42 sticks of gum evenly with 5 people.
9. Constructed response   [3.OA.2]
   $28 \div 4 = 7$
10. Extended response   [3.OA.2]
    Part A: No. *Explanations may vary but should say something like the following:* They do not have enough wood. Using division, a 54-inch-long rod can only make 9 pieces that are each 6 inches long: $54 \div 6 = 9$ and 9 is less than 10.
    Part B: Yes. *Explanations may vary but should say something like the following:* You can subtract 6 from 60 ten times, so $60 \div 6 = 10$.

Lesson 3 *Multiplication and Division Facts* pp. 16–19

1. A   [3.OA.7]
2. D   [3.OA.7]
3. B   [3.OA.7]
4. A   [3.OA.7]
5. D   [3.OA.7]
6. A   [3.OA.7]
7. C   [3.OA.7]
8. D   [3.OA.7]
9. A   [3.OA.7]
10. Constructed response   [3.OA.7]
    6
11. Constructed response   [3.OA.7]
    28
12. Constructed response   [3.OA.7]
    10
13. Constructed response   [3.OA.7]
    40
14. Constructed response   [3.OA.7]
    I know that 4 is twice as much as 2. So 4×9 is twice as much as 2×9: $4 \times 9 = 18 + 18 = 36$.

Common Core State Standards
for Mathematics, Grade 3

Operations and Algebraic Thinking   3.OA

Represent and solve problems involving multiplication and division

1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5×7.*

2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.*

3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = \square \div 3$, $6 \times 6 = ?$*

Understand properties of multiplication and the relationship between multiplication and division.
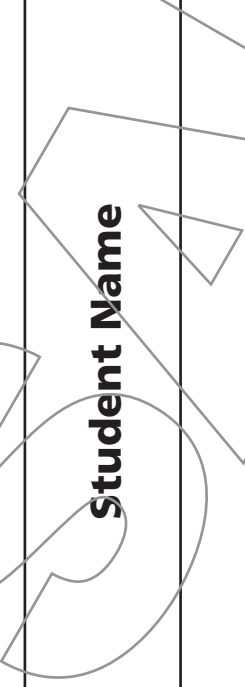
5. Apply properties of operations as strategies to multiply and divide. *Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)*

6. Understand division as an unknown-factor problem. *For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.*

Multiply and divide within 100.

7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Solve problems involving the four operations, and identify and explain patterns in arithmetic.

8. Solve two-step word problems using the four operations. 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.

Skills Analysis for Practice Test

MC = Multiple Choice = 1 pt
CR = Constructed Response = up to 2 pt
ER = Extended Response = up to 3 pt

Student Name	Operations and Algebraic Thinking MC: #1, 4, 8, 9, 16, 18, 20, 27 CR: #32, 36, 48, 49, 50 ER: #53 *21 points possible*	Number and Operations in Base Ten MC: #3, 13, 19, 26 CR: #45, 46 *8 points possible*	Number and Operations—Fractions MC: #2, 10, 17, 22, 29, 30 CR: #39, 40, 41 *12 points possible*	Measurement and Data MC: #6, 7, 11, 12, 15, 21, 24, 25, 28 CR: #33, 34, 35, 37, 38, 42, 43, 44, 47 ER: #51, 52 *33 points possible*	Geometry MC: #5, 14, 23 CR: #31 *5 points possible*	TOTAL SCORE *79 points possible*