

Using Common Core Standards to Enhance Classroom Instruction and Assessment

Robert J. Marzano, David C. Yanoski, Jan K. Hoegh, Julia A. Simms

Multiplication and Division

Second Grade

The student will recognize or recall specific vocabulary, such as:

- Add, addition, equation, explanation, expression, mental image, represent, subtract, subtraction, verbal, word problem.

The student will perform basic processes, such as:

- Determine whether a group of objects (up to 20) has an odd or even number of members; if the total is even, write an equation to express the total as a sum of two equal addends. (2.OA.C.4)

The student will:

- Use addition to find the total number of objects arranged in rectangular arrays with up to five rows and up to five columns; write an equation to express the total as a sum of equal addends. (2.OA.C.4)

Third Grade

The student will recognize or recall specific vocabulary, such as:

- Recognize or recall specific vocabulary, such as: digit, divide, division, equation, interpret, multiplication, multiple, multiply, number, place value, product, property, quotient, relate, represent, strategy, symbol, unknown, unknown-factor problem, whole number, word problem

The student will perform basic processes, such as:

- Interpret products of whole numbers (for example, understanding 5×7 as the total number of objects in five groups of seven) (3.OA.A.1)
- Interpret whole number quotients of whole numbers (for example, understanding $56 \div 8$ as the number of objects in each share when 56 objects are divided into equal share of 8 objects each) (3.OA.A.2)
- Fluently multiply and divide with 100.
- Know from memory all products of two one-digit numbers. 3.OA.C.7

The student will:

- Use multiplication and division within 100 to solve word problems (for example, using drawings and equations with a symbol for the unknown number to represent the problem) (3.OA.A.3)
- Determine the unknown whole number in a multiplication or division equation relating three whole numbers (for example, $8 \times \underline{\quad} = 45$, $5 = \underline{\quad} \div 3$) (3.OA.A.4)
- Solve division problems as unknown-factor problems (for example, finding $32 \div 8$ by finding the number that makes 32 when multiplied by 8 (3.OA.B.6)
- Multiply one-digit whole numbers by multiples of 10 in the range of 10 to 90 using strategies based on place value and properties of whole numbers (3.NBT.A.3)

Fourth Grade

The student will recognize or recall specific vocabulary, such as:

- additive, array, calculation, comparison, digit, distinguish, divide, dividend, division, divisor, equation, illustrate, interpret, model, multiplication, multiplicative, multiply, number, operation, place value, property, remainder, represent, quotient, strategy, symbol, unknown, verbal, whole number, word problem

The student will perform basic processes, such as:

- Interpret a multiplication equation as a comparison (4.OA.A.1)
- Represent verbal statements of multiplicative comparisons as multiplication equations (4.OA.A.1)
- Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit whole numbers (4.NBT.B.5)

	<ul style="list-style-type: none"> • Find whole number quotients and remainders with up to four-digit dividends and one-digit divisors (4.NBT.B.6) • Use arrays and/or models to solve multiplication and division problems. <p>The student will:</p> <ul style="list-style-type: none"> • Multiply and divide to solve word problems involving multiplicative comparisons (for example, by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison) (4.OA.A.2) • Solve multistep word problems posed with whole numbers and having whole number answers using the four operations, including division word problems in which remainders must be interpreted. (4. OA.A.3) • Illustrate and explain calculations using strategies based on place value, properties of operations, equations and or models (4 NBT.B.5)
Fifth Grade	
	<p>The student will recognize or recall specific vocabulary, such as:</p> <ul style="list-style-type: none"> • area model, decimal, digit, divide, dividend, division, divisor, equation, hundredth, illustrate, model, multiplication, multiply, reasoning, rectangular array, strategy, whole number. <p>The student will perform basic processes, such as:</p> <ul style="list-style-type: none"> • Multiply whole numbers and divide whole numbers with up to four-digit dividends and two-digit divisors (5.NBT.B.5; 5.NBT.B.6) • Multiply and divide decimals to hundredths using concrete models or drawings (5.NBT.B.7) <p>The student will:</p> <ul style="list-style-type: none"> • Illustrate and explain the multiplication and division of whole numbers using equations, rectangular arrays, and/or area models (5.NBT.B.5; 5.NBT.B.6) • Multiply and divide decimals to hundredths and explain the strategies and reasoning used (5.NBT.B.7)
Sixth Grade	
	<p>The student will recognize or recall specific vocabulary, such as:</p> <ul style="list-style-type: none"> • algorithm, common, decimal, digit, distributive property, divide, express, factor, greatest common factor, least common multiple, multiple, multiply, number, sum, whole number <p>The student will perform basic processes, such as:</p> <ul style="list-style-type: none"> • Divide multidigit numbers using the standard algorithm (6.NS.B.2) • Multiply and divide multidigit decimals using the standard algorithm (6.NS.B.3) • Find greatest common factor (≤ 100) or least common multiply (≥ 12) for two whole numbers (6.NS.B.4) <p>The student will:</p> <ul style="list-style-type: none"> • Use distributive property to express a sum of two whole numbers between one and 100 with a common factor as a multiple of a sum of two whole numbers with no common factor (6.NS.B.4)