

Ohio Mathematics - Extended Learning Standards

Grade 3

Operations and Algebraic Thinking

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. (Note: These standards are written with the convention that $a \times b$ means a groups of b objects each; however, because of the commutative property, students may also interpret 5×7 as the total number of objects in 7 groups of 5 objects each.) **3.OA.1**

Complexity a

- a Represent products of whole numbers up to 10×10 using arrays, area models, or physical objects (whole numbers 0 through 10). **3.OA.1A**

Complexity b

- b Represent products with factors of 1s, 2s, 3s, 4s, 5s, and 10s using arrays, area models, or physical objects (whole numbers 1 through 10). **3.OA.1B**

Complexity c

- c Represent products with factors of 1s, 2s, and 5s using arrays, area models, or physical objects (whole numbers 1 through 10). **3.OA.1C**

Learning Progression

- Identify 1, 2, and 5 blocks. **3.OA.1.LP.A**
- Identify groups of blocks 1s, 2s, and 5s. **3.OA.1.LP.B**
- Build groups of blocks into rows and columns (arrays). **3.OA.1.LP.C**
- Count the number of blocks in a given array. **3.OA.1.LP.D**
- Build an array and count the number of blocks. **3.OA.1.LP.E**
- Skip count by 2s and 5s. **3.OA.1.LP.F**
- Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns. **3.OA.1.LP.G**
- Identify the number of blocks in each row and each column. **3.OA.1.LP.H**
- Match an array to its factors. **3.OA.1.LP.I**
- Engagement Statements (demonstration of engaged in the topic) **3.OA.1.LP.J**
- Interact with physical objects (blocks). **3.OA.1.LP.K**

- 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.OA.2**

Complexity a

- a Represent quotients of single-digit whole numbers up to 100. **3.OA.2A**

Complexity b

- b Represent quotients using arrays, area models, or other physical representations for whole number factors of 1s, 2s, 3s, 4s, 5s, and 10s with

products not exceeding 100. 3.OA.2B

Complexity c

- c Represent quotients using arrays, area models, or other physical representations for whole numbers factors of 1s, 2s, and 5s with products not exceeding 10, 20, and 50, respectively. 3.OA.2C

Learning Progression

- Identify 1, 2, and 5 blocks. 3.OA.2.LP.A
- Identify groups of blocks 1s, 2s, and 5s. 3.OA.2.LP.B
- Share up to 10 objects equally between 2 and 5 people (without remainders). 3.OA.2.LP.C
- Engagement Statements (demonstration of engaged in the topic) 3.OA.2.LP.D
- Interact with physical objects (blocks). 3.OA.2.LP.E

- 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. Drawings need not show details, but should show the mathematics in the problem. (This applies wherever drawings are mentioned in the Standards.) 3.OA.3

Complexity a

- a Solve word problems with products and/ or quotients of whole numbers using arrays, area models, or other physical representations (whole numbers factors of 0 through 10). 3.OA.3A

Complexity b

- b Solve word problems with products of whole numbers 1s, 2s, 3s, 4s, 5s, and 10s using arrays, area models, or other physical objects (products not exceeding 100). 3.OA.3B

Complexity c

- c Represent word problems with products of whole number factors of 1s, 2s, and 5s using arrays, area models or other physical representations (whole numbers 1 through 10). 3.OA.3C

Learning Progression

- Identify the appropriate numbers in the multiplication word problem. 3.OA.3.LP.A
- Match a physical representation or drawing to the multiplication word problem. 3.OA.3.LP.B
- Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns. 3.OA.3.LP.C
- Write a number sentence to express the total as a sum of equal addends. 3.OA.3.LP.D
- Engagement Statements (demonstration of engaged in the topic) 3.OA.3.LP.E

- Interact with physical objects (blocks) or drawings representing multiplication word problems. [3.OA.3.LP.F](#)

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 $8 \times \square = 48$; $5 = \square \div 3$; $6 \times 6 =$

☐ [3.OA.4](#)

Complexity a

- a** When given a physical or visual model representing a multiplication fact (whole number factors of 0 through 10 with products not exceeding 100) and a set of 3 answer choices, identify the unknown whole number. [3.OA.4A](#)

Complexity b

- b** When given a physical or visual model representing a multiplication fact (whole number factors of 1s, 2s, 3s, 4s, 5s, and 10s with products not exceeding 100) and a set of 3 answer choices, identify the unknown whole number. [3.OA.4B](#)

Complexity c

- c** Match a provided physical or visual model to one of three provided multiplication or division number sentences. AND When given a number sentence, identify the operations symbol for $\div$, $\times$, and $=$. [3.OA.4C](#)

Learning Progression

- Identify a number sentence. [3.OA.4.LP.A](#)
- Identify a physical object or drawing. [3.OA.4.LP.B](#)
- Know that a symbol x can represent a missing (unknown) number. [3.OA.4.LP.C](#)
- Know the operations for each of the three symbols ($\times$, $=$, $\div$) [3.OA.4.LP.D](#)
- Read and interpret a traditional number sentence ($2 \times 2 = 4$) [3.OA.4.LP.E](#)
- Relate a picture or objects to a number sentence. [3.OA.4.LP.F](#)
- Group or partition sets of numbers into equal groups to determine the missing number. [3.OA.4.LP.G](#)
- Record a number sentence to express the total as the sum of equal addends. [3.OA.4.LP.H](#)
- Engagement Statements (demonstration of engaged in the topic) [3.OA.4.LP.I](#)
- Interact with physical objects (blocks) or drawings that represents an equation. [3.OA.4.LP.J](#)

Understand properties of multiplication and the relationship between multiplication and division.

- 5 Apply properties of operations as strategies to multiply and divide. For example, 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). Students need not use formal terms for these properties. **3.OA.5**

Complexity a

- a Physically or visually solve multiplication or division number sentences (whole number factors of 0 through 10 with products not exceeding 100) using the commutative and/ or distributive properties (e.g., solving 3×8 by adding 3×5 to 3×3). **3.OA.5A**

Complexity b

- b Physically or visually solve multiplication number sentences (whole number factors of 1s, 2s, 3s, 4s, 5s, and 10s with products not exceeding 100) using the commutative property **3.OA.5B**

Complexity c

- c Physically or visually match multiplication number sentences using the commutative property **3.OA.5C**

Learning Progression

- Identify a number sentence. **3.OA.5.LP.A**
 - Count the number of objects in an array. **3.OA.5.LP.B**
 - Recognize the symbols for multiplication ($\times$) and equals ($=$). **3.OA.5.LP.C**
 - Read and interpret a traditional number sentence ($2 \times 3 = 6$). **3.OA.5.LP.D**
 - Relate a picture or objects to a number sentence. **3.OA.5.LP.E**
 - Recognize factors in an array. **3.OA.5.LP.F**
 - Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns. **3.OA.5.LP.G**
 - Write the number sentence to express the total as a product of two factors. **3.OA.5.LP.H**
 - Engagement Statements (demonstration of engaged in the topic) **3.OA.5.LP.I**
 - Interact with physical objects (blocks) or drawings that represents an equation. **3.OA.5.LP.J**
- 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. **3.OA.6**

Complexity a

- a Understand that the inverse operation of division is multiplication. Can answer a multiplication question to solve for division (What times 3 equals

15?). Then solve the division problem (understand that 3 groups of 5 equals 15). **3.OA.6A**

Complexity b

- b** Understand division as the inverse operation of multiplication by sorting objects or pictures into equal groups and matching multiplication/division problems ($3 \times 5 = 15$ $15 \div 3 = 5$). **3.OA.6B**

Complexity c

- c** Show division as sorting objects or pictures into equal groups. **3.OA.6C**

Learning Progression

- Identify a number sentence. **3.OA.6.LP.A**
- Count the number of objects in an array. **3.OA.6.LP.B**
- Recognize the symbols for division ($\div$) and equals ($=$). **3.OA.6.LP.C**
- Read and interpret a traditional number sentence ($6 \div 2 = 3$). **3.OA.6.LP.D**
- Relate a picture or objects to a number sentence. **3.OA.6.LP.E**
- Recognize factors in an array. **3.OA.6.LP.F**
- Engagement Statements (demonstration of engaged in the topic) **3.OA.6.LP.G**
- Interact with physical objects (blocks) or drawings that represents an equation. **3.OA.6.LP.H**

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. Limit to division without remainders. By the end of grade 3, know from memory all products of two one-digit numbers. **3.OA.7**

Complexity a

- a** Fluently know all products (whole number factors of 0 through 10) and their respective division problems. **3.OA.7A**

Complexity b

- b** Fluently know all products for whole number factors of 1s, 2s, 3s, 4s, 5s, and 10s with products not exceeding 100. **3.OA.7B**

Complexity c

- c** Solve multiplication number sentences for multiples of 1s, 2s, and 5s (whole numbers 1 through 10) using arrays, area models, or other physical representations. **3.OA.7C**

Learning Progression

- Identify a number sentence. **3.OA.7.LP.A**
- Count the number of objects in an array. **3.OA.7.LP.B**
- Recognize the symbols for multiplication ($\times$) and equals ($=$). **3.OA.7.LP.C**
- Read and interpret a traditional number sentence ($2 \times 3 = \underline{\quad}$). **3.OA.7.LP.D**
- Relate a picture or objects to a number sentence. **3.OA.7.LP.E**
- Know that a symbol x can represent a missing product. **3.OA.7.LP.F**
- Engagement Statements (demonstration of engaged in the topic) **3.OA.7.LP.G**
- Interact with physical objects (blocks) or drawings that represents a multiplication number sentence. **3.OA.7.LP.H**

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 or a symbol, which stands for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. This standard is limited to problems posed with whole numbers and having whole-number answers. Students may use parentheses for clarification since algebraic order of operations is not expected. **3.OA.8**

Complexity a

- a** Represent a 2-step problem using an equation with a symbol (e.g., shape) standing for the unknown and solve. **3.OA.8A**

Complexity b

- b** Identify the array, area model, or other physical representation that shows the solution of a 1-step number sentence from a word problem (excludes division). **3.OA.8B**

Complexity c

- c** Identify the number sentence that correlates with a given 1-step word problem (excludes division). **3.OA.8C**

Learning Progression

- Identify a number sentence. **3.OA.8.LP.A**
 - Count the number of objects in an array. **3.OA.8.LP.B**
 - Recognize the symbols for addition (+), subtraction, (−), multiplication (×), and equals (=). **3.OA.8.LP.C**
 - Read and interpret a traditional one-step number sentence ($2 \times 3 = \underline{\quad}$). **3.OA.8.LP.D**
 - Relate a picture or objects to a number sentence. **3.OA.8.LP.E**
 - Know that a symbol x can represent a missing value. **3.OA.8.LP.F**
 - Engagement Statements (demonstration of engaged in the topic) **3.OA.8.LP.G**
 - Interact with physical objects (blocks) or drawings representing addition, subtraction, or multiplication word problems. **3.OA.8.LP.H**
- 9** Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends. **3.OA.9**

Complexity a

- a** Identify and explain arithmetic patterns in a number chart or addition and multiplication tables. **3.OA.9A**

Complexity b

- b** Identify arithmetic patterns in a number chart, or addition and multiplication tables. **3.OA.9B**

Complexity c

- c** Use odd or even numbers to identify/make a pattern using repeated addition within a 100s chart. **3.OA.9C**

Learning Progression

- Identify the numerals 1-20 on a 100s chart. **3.OA.9.LP.A**
 - Know the word names for the numbers 1-100. **3.OA.9.LP.B**
 - Count from 1-100. **3.OA.9.LP.C**
 - Write numerals from 0 to 20. **3.OA.9.LP.D**
 - Represent a number of objects with a written numeral 0-20. **3.OA.9.LP.E**
 - Count the number of objects up to 20. **3.OA.9.LP.F**
 - Skip count by 2s and 5s up to 20 using a physical objects and visual models. **3.OA.9.LP.G**
 - Repeatedly add the same number using physical objects and visual models. **3.OA.9.LP.H**
 - Relate counting to addition by counting on 2 to add 2 or 5 to add 5. **3.OA.9.LP.I**
 - Engagement Statements (demonstration of engaged in the topic) **3.OA.9.LP.J**
 - Interact with physical objects (blocks) or drawings (may include 100s chart) representing whole numbers within 20. **3.OA.9.LP.K**
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Number and Operations in Base Ten

Use place value understanding and properties of operations to perform multi-digit arithmetic. A range of strategies and algorithms may be used.

- 1 Use place value understanding to round whole numbers to the nearest 10 or 100. **3.NBT.1**

Complexity a

- a** Use place value understanding and a physical and/or visual representation to round multi-digit whole numbers to the nearest 10 or 100. **3.NBT.1A**

Complexity b

- b** Identify a given number to the nearest 10s place when using number lines and/or number grids (e.g., 22 will round to 20). **3.NBT.1B**

Complexity c

- c** Using a physical or visual representation for numbers 0 through 10, when shown two numbers, show which number is closer to 0 or 10 (e.g., shown 5 or 6, student is asked which number shown is closer to 10). **3.NBT.1C**

Learning Progression

- Know what a number line is. **3.NBT.1.LP.A**
- Know the order of the numbers from 0 to 10. **3.NBT.1.LP.B**
- Identify a whole number on a number line marked with whole numbers up to 10. **3.NBT.1.LP.C**
- Identify 0 on a number line. **3.NBT.1.LP.D**
- Identify a missing whole number value on a number line marked with whole number up to 10. **3.NBT.1.LP.E**
- Compare distances of objects using a vertical or horizontal number line. **3.NBT.1.LP.F**
- Understand that 2 is the distance from 0 to 2 and 3 is the distance from 0 to 3 using standard units for all lengths from 1 to 10. **3.NBT.1.LP.G**
- Engagement Statements (demonstration of engaged in the topic) **3.NBT.1.LP.H**
- Interact with physical objects (blocks) or drawings (may include 100s chart) representing whole numbers within 20. **3.NBT.1.LP.I**

- 2 Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/ or the relationship between addition and subtraction. **3.NBT.2**

Complexity a

- a** Add and subtract within 500 using strategies based on place value, and the relationship between addition and subtraction (no calculator). **3.NBT.2A**

Complexity b

- b** Add and subtract within 100 using strategies based on place value, and the relationship between addition and subtraction (no calculator). **3.NBT.2B**

Complexity c

- c Add and subtract within 20 using strategies based on place value, and the relationship between addition and subtraction (no calculator, but could include concrete objects or number charts). **3.NBT.2C**

Learning Progression

- Represent a number with a set of physical objects or a drawing. **3.NBT.2.LP.A**
- Understand addition is the combining of two (or more) sets of objects. **3.NBT.2.LP.B**
- Understand subtraction is taking away of one amount of objects from another. **3.NBT.2.LP.C**
- Understand that addition and subtraction are opposites. **3.NBT.2.LP.D**
- Know the symbols for addition (+), subtraction, (−), and equals (=). **3.NBT.2.LP.E**
- Relate counting to addition and subtraction, e.g., by counting on 2 to add 2. **3.NBT.2.LP.F**
- Add and subtract within 10 using strategies. Strategies may include: ° Counting on ° Making ten ($8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$) ° Decomposing a number leading to a ten ($13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$) ° Using the relationship between addition and subtraction; knowing that ° $8 + 4 = 12$, one knows $12 - 8 = 4$ and ° Creating equivalent but easier or known sums (adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$). **3.NBT.2.LP.G**
- Engagement Statements (demonstration of engaged in the topic) **3.NBT.2.LP.H**
- Interact with physical objects (blocks) or drawings (may include 100s chart) representing whole numbers within 20. **3.NBT.2.LP.I**

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

Complexity a

- a Multiply one-digit whole numbers by multiples of 10 using visual and/or physical representation. **3.NBT.3A**

Complexity b

- b Multiply one-digit whole numbers by 10 (e.g., $3 \times 10 = 30$). **3.NBT.3B**

Complexity c

- c When shown a number sentence of one digit whole number multiplied by 10, match the product to the number sentence when shown 2 possible products (e.g., $5 \times 10 = 50$ or 80). **3.NBT.3C**

Learning Progression

- Count to 10. **3.NBT.3.LP.A**

- Count to 10 using objects. 3.NBT.3.LP.B
 - Create multiple groups of 10 using objects. 3.NBT.3.LP.C
 - Repeatedly add groups of 10 using physical objects. 3.NBT.3.LP.D
 - Relate counting to addition by counting on 10 to add 10. 3.NBT.3.LP.E
 - Know the symbols for multiplication ($\times$) and equals ($=$). 3.NBT.3.LP.F
 - Relate multiplication to repeated addition by writing a number sentence. 3.NBT.3.LP.G
 - Represent a number with a set of physical objects or a drawing. 3.NBT.3.LP.H
 - Engagement Statements (demonstration of engaged in the topic) 3.NBT.3.LP.I
 - Interact with physical objects (blocks) or drawings (100s chart or multiplication chart). 3.NBT.3.LP.J
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Number and Operations – Fractions

Develop understanding of fractions as numbers. Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.

- 1 Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$. **3.NF.1**

Complexity a

- a** Match fractions with their model (limit to fractions with denominators of 2, 3, 4, 6, 8). **3.NF.1A**

Complexity b

- b** Match fractions with their model (limit to $\frac{1}{3}$, $\frac{2}{3}$, $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$). **3.NF.1B**

Complexity c

- c** Identify a unit fraction ($\frac{1}{4}$ or $\frac{1}{2}$) as part of a whole when shown as a physical and/or visual representation. **3.NF.1C**

Learning Progression

- Identify a whole partitioned into 2 or 4 equal shares. **3.NF.1.LP.A**
- Describe the equal shares of a whole as halves or fourths, or half of or a fourth of. **3.NF.1.LP.B**
- Describe the whole as two halves or four fourths. **3.NF.1.LP.C**
- Engagement Statements (demonstration of engaged in the topic) **3.NF.1.LP.D**
- Interact with fraction models. **3.NF.1.LP.E**

- 2 Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction $\frac{1}{b}$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $\frac{1}{b}$ and that the endpoint of the part based at 0 locates the number $\frac{1}{b}$ on the number line. b. Represent a fraction $\frac{a}{b}$ (which may be greater than 1) on a number line diagram by marking off a lengths $\frac{1}{b}$ from 0. Recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line. **3.NF.2**

Complexity a

- a** Identify fractions on a number line marked in equal parts matching the fraction denominator (limit to fractions with denominators of 2, 3, 4, 6, 8). **3.NF.2A**

Complexity b

- b** Identify fraction(s) on a number line marked in equal parts matching the fraction(s)' denominator (limit to denominators of 2, 3 and 4). **3.NF.2B**

Complexity c

- c** Identify a fraction on a number line marked in equal parts matching the fraction denominator (limit to $\frac{1}{2}$ and $\frac{1}{4}$). **3.NF.2C**

Learning Progression

- Know what a number line is. **3.NF.2.LP.A**
- Identify 0 on a number line. **3.NF.2.LP.B**
- Know each marking on the number line represents a unit fraction of $\frac{1}{4}$ or $\frac{1}{2}$. **3.NF.2.LP.C**
- Identify the fractional markings on a number line marked with fractions of $\frac{1}{4}$ or $\frac{1}{2}$. **3.NF.2.LP.D**
- Identify a missing fraction on a number line marked with $\frac{1}{4}$ or $\frac{1}{2}$ units up to 1. **3.NF.2.LP.E**
- Engagement Statements (demonstration of engaged in the topic) **3.NF.2.LP.F**
- Interact with number lines with fractional unit markings of $\frac{1}{4}$ or $\frac{1}{2}$. **3.NF.2.LP.G**

- 3** Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the same size or the same point on a number line. b. Recognize and generate simple equivalent fractions, e.g., $\frac{1}{2} = \frac{2}{4}$, $\frac{4}{6} = \frac{2}{3}$. Explain why the fractions are equivalent, e.g., by using a visual fraction model. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form $3 = \frac{3}{1}$; recognize that $\frac{6}{1} = 6$; locate $\frac{4}{4}$ and 1 at the same point of a number line diagram. d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model. **3.NF.3**

Complexity a

- a** Use a visual fraction model to identify greater than, less than, and equal to when comparing 2 fractions. **3.NF.3A**

Complexity b

- b** Use visual fraction models to identify equivalent fractions with denominators of 2, 4, 6, and 8. **3.NF.3B**

Complexity c

- a** Identify equivalent fractions of $\frac{1}{2}$ and $\frac{1}{4}$ when represented with visual fraction models (e.g. matching model of $\frac{1}{2}$ and $\frac{2}{4}$ on a number line). **3.NF.3C**

Learning Progression

- Identify the same sized whole partitioned into 2 and 4 equal shares. **3.NF.3.LP.A**
- Describe the equal shares of a whole as one half of or two fourths of. **3.NF.3.LP.B**
- Describe the whole as two halves or four fourths. **3.NF.3.LP.C**
- Engagement Statements (demonstration of engaged in the topic) **3.NF.3.LP.D**

- Interact with area (rectangles) and length (number lines) fraction models. **3.NF.3.LP.E**
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Measurement and Data

Solve problems involving money, measurement, and estimation of intervals of time, liquid volumes, and masses of objects.

- 1** Work with time and money. a. Tell and write time to the nearest minute. Measure time intervals in minutes (within 90 minutes). Solve real-world problems involving addition and subtraction of time intervals (elapsed time) in minutes, e.g., by representing the problem on a number line diagram or clock. b. Solve word problems by adding and subtracting within 1,000, dollars with dollars and cents with cents (not using dollars and cents simultaneously) using the \$ and ¢ symbol appropriately (not including decimal notation). **3.MD.1**

Complexity a

a1 Tell time to the nearest 15 minutes on an analog clock. AND **3.MD.1A1**

a2 Name and/or identify equivalent combinations of coins and/or bills. **3.MD.1A2**

Complexity b

b1 Tell time to the nearest 30 minutes on an analog clock. AND **3.MD.1B1**

b2 Identify, name, and state value for all coins and bills (coins: pennies, nickels, dimes, quarters; bills: \$1, \$5, \$10, \$20). **3.MD.1B2**

Complexity c

c1 Tell time to the nearest hour on an analog clock. AND **3.MD.1C1**

c2 Identify and name all coins and bills. **3.MD.1C2**

Learning Progression

- Count to 12. **3.MD.1.LP.A**
- Tell time using a digital clock. **3.MD.1.LP.B**
- Know the meaning of the hour and the minute hands on an analog clock. **3.MD.1.LP.C**
- Count to 12 using an analog clock. **3.MD.1.LP.D**
- Read the hour hand on an analog clock at different times of a day. **3.MD.1.LP.E**
- Describe differences between U.S. coins. **3.MD.1.LP.F**
- Describe differences between U.S. bills. **3.MD.1.LP.G**
- Find numerals on U.S. bills (\$1, \$5, and \$10). **3.MD.1.LP.H**
- Engagement Statements (demonstration of engaged in the topic) **3.MD.1.LP.I**
- Interact with a clock and U.S. currency (pennies, nickels, dimes, quarters, \$1, \$5, and \$10). **3.MD.1.LP.J**

- 2** Measure and estimate liquid volumes and masses of objects using standard units of grams, kilograms, and liters. Add, subtract, multiply, or divide whole numbers to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. Excludes multiplicative comparison problems involving notions of “times as much”; see Table 2, page 96. **3.MD.2**

Complexity a

- a** Solve 1-step word problems involving measures of liquid volumes and masses of objects using standard units of measure. **3.MD.2A**

Complexity b

- b** Using models and drawings, measure and estimate liquid volumes and masses of objects using standard units of measure (e.g., measuring cup, scale). **3.MD.2B**

Complexity c

- c** Select the appropriate tool to measure volume and mass (e.g., measuring cup, scale). **3.MD.2C**

Learning Progression

- Describe measurable attributes of a single object using terms such as heavy/light. **3.MD.2.LP.A**
- Directly compare two measuring cups to see which one holds more and which one holds less. **3.MD.2.LP.B**
- Directly compare two beakers to see which one holds more and which one holds less. **3.MD.2.LP.C**
- Use different types of scales to measure mass of objects. **3.MD.2.LP.D**
- Use different types of cups to measure volume of liquids. **3.MD.2.LP.E**
- Engagement Statements (demonstration of engaged in the topic) **3.MD.2.LP.F**
- Interact with measurement tools for volume and mass. **3.MD.2.LP.G**

Represent and interpret data.

- 3** Create scaled picture graphs to represent a data set with several categories. Create scaled bar graphs to represent a data set with several categories. Solve two-step “how many more” and “how many less” problems using information presented in the scaled graphs. For example, create a bar graph in which each square in the bar graph might represent 5 pets, then determine how many more/less in two given categories. **3.MD.3**

Complexity a

- a** Create scaled bar (or picture) graph from given or collected data sets and interpret the graph, including solving 1-step (e.g., “how many more” “how many less” problems). **3.MD.3A**

Complexity b

- b** Identify quantities from a picture or bar graph (e.g., in a class graph representing pets, represent 4 cats with 4 blocks or 4 cat pictures and 2 hamsters with 2 blocks or pictures). **3.MD.3B**

Complexity c

- c** Sort data on a bar graph (e.g., weather– sunny, cloudy, rainy, snowy) **3.MD.3C**

Learning Progression

- Classify objects into categories. **3.MD.3.LP.A**
- Count the number of objects in each category. **3.MD.3.LP.B**
- Sort U.S. currency by coins (pennies, nickels, dimes, quarters) or bills (\$1, \$5, \$10). **3.MD.3.LP.C**
- Create a bar graph with a scale of 1 by stacking physical objects. **3.MD.3.LP.D**
- Engagement Statements (demonstration of engaged in the topic) **3.MD.3.LP.E**
- Interact with a bar graph. **3.MD.3.LP.F**

- 4** Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by creating a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. **3.MD.4**

Complexity a

- a** Measure objects using a ruler to the nearest fourth of an inch. **3.MD.4A**

Complexity b

- b** Measure objects using a ruler to the nearest half inch. **3.MD.4B**

Complexity c

- c** Measure objects using a ruler to the nearest inch. **3.MD.4C**

Learning Progression

- Identify inches on a ruler. **3.MD.4.LP.A**

- Express the length of an object as a whole number of length units by laying multiple copies of a shorter object (the length unit) end to end. **3.MD.4.LP.B**
- Understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. **3.MD.4.LP.C**
- Engagement Statements (demonstration of engaged in the topic) **3.MD.4.LP.D**
- Interact with a ruler. **3.MD.4.LP.E**

- 5** Recognize area as an attribute of plane figures and understand concepts of area measurement. a. A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area. b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units. **3.MD.5**

Complexity a

- a** Recognize the number of units in a given surface area represents an array multiplication problem. **3.MD.5A**

Complexity b

- b** Understand that an equal-sided square can represent 1 unit of measure and can be counted to determine the area of a plane figure. **3.MD.5B**

Complexity c

- c** Understand that the term “area” is related to measurement of a surface. **3.MD.5C**

Learning Progression

- Identify surfaces where an area can be measured. **3.MD.5.LP.A**
- Engagement Statements (demonstration of engaged in the topic) **3.MD.5.LP.B**
- Interact with flat two-dimensional surfaces. **3.MD.5.LP.C**

- 6** Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units). **3.MD.6**

Complexity a

- a** Find the area of rectangles with whole-number side lengths by counting unit squares (limit area up to 40). **3.MD.6A**

Complexity b

- b** Find the area of rectangles with whole-number side lengths by counting unit squares (limit to factors of 1s, 2s, 3s, 4s, 5s, and 10s with products not exceeding 30). **3.MD.6B**

Complexity c

- c** Find the area of rectangles with whole-number side lengths by counting unit squares (limit factors of 1s, 2s, and 5s and areas up to 20). **3.MD.6C**

Learning Progression

- Identify surfaces where an area can be measured. **3.MD.6.LP.A**
- Count unit squares up to 20 on a flat surface. **3.MD.6.LP.C**
- Lay unit squares up to 20 on a flat surface. **3.MD.6.LP.B**
- Arrange unit squares up to 20 into rows and columns. **3.MD.6.LP.D**
- Engagement Statements (demonstration of engaged in the topic) **3.MD.6.LP.E**
- Interact with flat two-dimensional surfaces. **3.MD.6.LP.F**

7 Relate area to the operations of multiplication and addition. a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. c. Use tiling to show in a concrete case that the area of a rectangle with whole number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$ (represent the distributive property with visual models including an area model). d. Recognize area as additive. Find the area of figures composed of rectangles by decomposing into nonoverlapping rectangles and adding the areas of the nonoverlapping parts, applying this technique to solve realworld problems. **3.MD.7**

Complexity a

- a** Given the side length measures for a rectangle, find the area (whole number factors with areas limited to 40). **3.MD.7A**

Complexity b

- b** Given a visual model of a tiled rectangle, identify a number sentence (repeated addition or multiplication) that represents a solution for finding the area (whole number factors with areas limited to 30). **3.MD.7B**

Complexity c

- c** Use tiling to cover the area of a square and count the tiles (unit squares) to find the area (whole number factors with areas limited to 20). **3.MD.7C**

Learning Progression

- Identify surfaces where an area can be measured. **3.MD.7.LP.A**
- Lay unit squares up to 20 on a flat surface. **3.MD.7.LP.B**
- Count unit squares up to 20 on a flat surface. **3.MD.7.LP.C**
- Arrange unit squares up to 20 into rows and columns. **3.MD.7.LP.D**
- Engagement Statements (demonstration of engaged in the topic) **3.MD.7.LP.E**
- Interact with flat two-dimensional surfaces. **3.MD.7.LP.F**

Geometric measurement: Recognize perimeter as an attribute of plane figures and distinguish between linear and area measures

- 8** Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters. **3.MD.8**

Complexity a

- a** Solve one-step measurement word problems involving shapes with the same area and different perimeters. **3.MD.8A**

Complexity b

- b** Solve addition or subtraction measurement word problems involving perimeter. **3.MD.8B**

Complexity c

- c** Solve addition measurement problems by finding the perimeter of a rectangle represented on a grid. **3.MD.8C**

Learning Progression

- Identify surfaces where a perimeter can be measured. **3.MD.8.LP.A**
 - Lay inch squares up to 20 around a flat surface. **3.MD.8.LP.B**
 - Count inch squares up to 20 all the way around a flat surface. **3.MD.8.LP.C**
 - Measure length and width with units and record the measurement. **3.MD.8.LP.D**
 - Engagement Statements (demonstration of engaged in the topic) **3.MD.8.LP.E**
 - Interact with flat two-dimensional surfaces. **3.MD.8.LP.F**
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Geometry

Reason with shapes and their attributes.

- 1 Draw and describe triangles, quadrilaterals (rhombuses, rectangles, and squares), and polygons (up to 8 sides) based on the number of sides and the presence or absence of square corners (right angles). **3.G.1**

Complexity a

- a Sort quadrilaterals by the number of sides and/ or the presence or absence of square corners (right angles) (limit quadrilaterals to rectangles, squares, and rhombuses). **3.G.1A**

Complexity b

- b Sort polygons with up to 8 sides by the number of sides (Limit quadrilaterals to rectangles, squares and rhombuses). **3.G.1B**

Complexity c

- c Match objects in the environment to their twodimensional shape based on the number of sides (e.g., match a stop sign in the real world to an octagon shape). **3.G.1C**

Learning Progression

- Identify shapes as two-dimensional (lying in a plane, flat) or three-dimensional (solid). **3.G.1.LP.A**
- Name shapes regardless of their orientations or overall size. **3.G.1.LP.B**
- Engagement Statements (demonstration of engaged in the topic) **3.G.1.LP.C**
- Interact with two- and three-dimensional objects in their environment. **3.G.1.LP.D**

- 2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape. **3.G.2**

Complexity a

- a Partition rectangles into two, three, or four equal parts; identify a part as $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{3}$. **3.G.2A**

Complexity b

- b Partition rectangles into two or four equal parts, identify the parts as “halves,” “quarters,” and whole. **3.G.2B**

Complexity c

- c Count the number of sections in a rectangle that has been divided into equal parts (limit to half and quarter). **3.G.2C**

Learning Progression

- Identify a whole partitioned into 2 or 4 equal shares. **3.G.2.LP.A**
- Describe the equal shares of a whole as halves or fourths, or half of or a fourth of. **3.G.2.LP.B**
- Describe the whole as two halves or four fourths. **3.G.2.LP.C**

- Engagement Statements (demonstration of engaged in the topic) 3.G.2.LP.D
- Interact with fraction models. 3.G.2.LP.E