4th Grade Math

ELG 4.OA.A Use the four operations with whole numbers to solve problems

Vertical Progression:

2nd Grade	**2.OA.A Represent and solve problems involving addition and subtraction.** ○ **2.OA.A.1** Use addition and subtraction within 100 to solve one-and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions, e.g. by using drawings and equations with a symbol for the unknown number to represent the problem. **2.OA.C Work with equal groups of objectives to gain foundations for multiplication.** ○ **2.OA.C.4** Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
3rd Grade	**3.OA.A Represent and solve problems involving multiplication and division.** ○ **3.OA.A.1** Interpret products of whole numbers, e.g. interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. ○ **3.OA.A.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. **3.OA.D Solve problems involving the four operations, and identify and explain patterns in arithmetic.** ○ **3.OA.D.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.
4th Grade	**4.OA.A Use the four operations with whole numbers to solve problems**. ○ **4.OA.A.1** Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. ○ **4.OA.A.2** Multiply or divide to solve word problems involving multiplicative comparison, e.g., 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.3** Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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.
5th Grade	**5.NBT.B Perform operations with multi-digit whole numbers and with decimals to hundredths.** ○ **5.NBT.B.5** Fluently multiply multi-digit whole numbers using the standard algorithm. ○ **5.NBT.B.6** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. ○ **5.NBT.B.7** Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

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Students will demonstrate command of the ELG by:

- Drawing and interpreting an array demonstrating a multiplication equation as a comparison.
- Modeling multiplication equations as a comparison using manipulatives, students acting, etc.
- Using symbols to solve equations and solving for the variables in the problem.
- Choosing the best operation to solve a word problem.
- Solving multi-step word problems using the four operations, including division problems with remainders.
- Checking multi-step problem using mental math and estimation.

Vocabulary:

- compare
- difference
- equation
- estimate
- mental computation
- product
- quotient
- reasonableness
- remainder
- round
- sum
- unknown
- variable

Sample Instructional/Assessment Tasks:

1) **Standard(s):** 4.OA.A

Source: Illustrative Mathematics
https://www.illustrativemathematics.org/content-standards/4/OA/A/tasks/356

Task Prompt:

There are two snakes at the zoo, Jewel and Clyde. Jewel was six feet and Clyde was eight feet. A year later Jewel was eight feet and Clyde was 10 feet. Which one grew more?

Solution

Viewing this additively, both snakes grew 2 feet and therefore grew the same amount. Viewing it multiplicatively, Jewel grew 2/6 its length, while Clyde grew 2/8 its length. From this perspective, Jewel grew more. Given the purposeful phrasing of the problem, both interpretations are reasonable, but the goal is to understand the two perspectives, thus the difference between additive and multiplicative reasoning.

2) Standard(s): 4.OA.A.2/4.OA.A.3

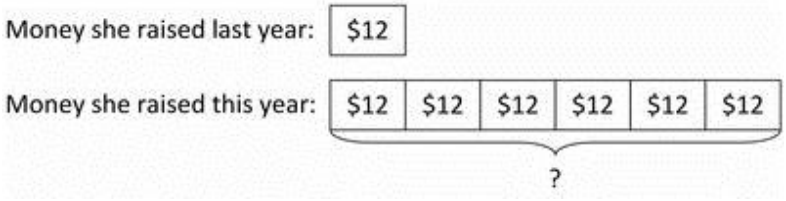
Source: Illustrative Mathematics
https://www.illustrativemathematics.org/content-standards/4/OA/A/2/tasks/263

Task Prompt:

1. Helen raised $12 for the food bank last year and she raised 6 times as much money this year. How much money did she raise this year?
2. Sandra raised $15 for the PTA and Nita raised $45. How many times as much money did Nita raise as compared to Sandra?
3. Luis raised $45 for the animal shelter, which was 3 times as much money as Anthony raised. How much money did Anthony raise?

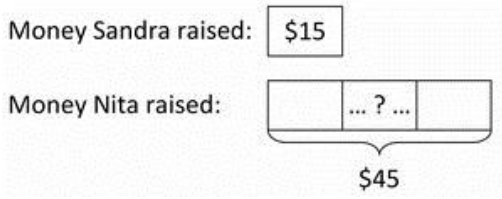
Solution: Tape diagram

1. She raised six times as much money (as shown in the diagram) so she raised 6×12=72.



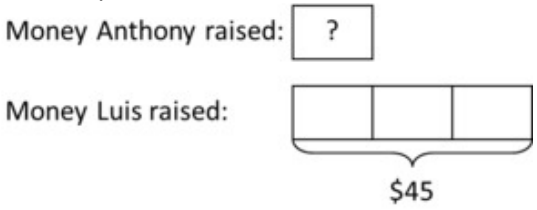
Helen raised $72 this year.

2. $n \times 15 = 45$ is equivalent to $45 \div 15 = n$



Nita raised 3 times as much as Sandra.

3. $3 \times n = 45$ is equivalent to $45 \div 3 = n$



Anthony raised $15.