

Multiplication and Division Problem Situations

| ASYMMETRICAL (NONMATCHING) FACTORS | | | | |
|---|---|---|---|--|
| | Product Unknown | Multiplier (Number of Groups) Unknown | Measure (Group Size) Unknown | |
| Equal Groups | <p>Mayim has 8 vases to decorate the tables at her party. She places 2 flowers in each vase. How many flowers does she need?</p> $8 \times 2 = x$ $x \div 8 = 2$ | <p>Mayim has some vases to decorate the tables at her party. She places 2 flowers in each vase. If she uses 16 flowers, how many vases does she have?</p> $x \times 2 = 16$ $x = 16 \div 2$ | <p>Mayim places 16 flowers in vases to decorate the tables at her party. There are 8 vases and each vase has the same number of flowers. How many flowers will be in each vase?</p> $8 \times x = 16$ $16 \div 8 = x$ | |
| | Resulting Value Unknown | Scale Factor (Times as Many) Unknown | Original Value Unknown | |
| Multiplicative Comparison | <p>Amelia's dog is 5 times older than Wanda's 3-year-old dog. How old is Amelia's dog?</p> $5 \times 3 = x$ $x \div 5 = 3$ | <p>Sydney has \$15 to spend at the movies. Her sister has \$5. How many times more money does Sydney have than her sister has?</p> $x \times 5 = 15$ $5 = 15 \div x$ | <p>Mrs. Smith has 15 puzzles in her classroom. That is 3 times as many puzzles as are in Mr. Jackson's room. How many puzzles are in Mr. Jackson's room?</p> $3 \times x = 15$ $15 \div 3 = x$ | |
| SYMMETRICAL (MATCHING) FACTORS | | | | |
| | Product Unknown | One Dimension Unknown | Both Dimensions Unknown | |
| Area/Array | <p>Bradley bought a new rug for the hallway in his house. One side measured 5 feet and the other side measured 3 feet. How many square feet does the rug cover?</p> $5 \times 3 = x$ $3 + 3 + 3 + 3 + 3 = x$ $3 \times 5 = x$ $5 + 5 + 5 = x$ | <p>The 12 members of the student council lined up on the stage to take yearbook pictures. The first row started with 6 students and the rest of the rows did the same. How many rows were there?</p> $6 \times x = 12$ $x = 12 \div 6$ | <p>Daniella was building a house foundation using her building blocks. She started with 20 blocks. How many blocks long and wide could the foundation be?</p> $x \times y = 20$ $20 \div x = y$ | |
| | Sample Space (Total Outcomes) Unknown | One Factor Unknown | Both Factors Unknown | |
| Combinations (Fundamental Counting Principle) | <p>Karen has 3 shirts and 7 pairs of pants. How many unique outfits can she make?</p> $3 \times 7 = x$ $3 = x \div 7$ | <p>Evelyn says that she can make 21 unique and different ice cream sundaes using just ice cream flavors and toppings. If she has 3 flavors of ice cream, how many kinds of toppings does Evelyn have?</p> $3 \times x = 21$ $21 \div 3 = x$ | <p>Audrey can make 21 different fruit sodas using the machine at the restaurant. How many different flavorings and sodas could there be?</p> $x \times y = 21$ $x = 21 \div y$ | |

Note: In the upper elementary grades, students begin the long journey of learning to think multiplicatively and proportionally. Part of this process involves moving away from counting and repeated addition to represent ideas that are better expressed with multiplication, but the primary years are still focused mostly on counting and adding. Some standards leverage that strength to introduce early ideas of multiplication: Counting squares in an array is one of them, and skip counting is another. We have included multiplication and division equations for our adult readers. K–2 students are not typically expected to represent these operations in equation form.

Table References

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