Chapter 7

Multiplication tables factors and multiples

Learn the ideas below, follow each worked example, then attempt the practice before checking the answers.

7.1 Multiplication facts and inverse facts

A multiplication table lists products of one fixed number with counting numbers. Learn facts accurately and connect each fact to division. Use known facts, doubling and the commutative property to recover a fact you forget. Zero times any number is zero.

Worked example From $7 \times 8 = 56$, we know $8 \times 7 = 56$, $56 \div 7 = 8$ and $56 \div 8 = 7$. To find 6×8, double $3 \times 8 = 24$ to obtain 48.

7.2 Building tables efficiently

The 2 table doubles, the 4 table doubles twice and the 8 table doubles three times. The 5 table is half the 10 table. For the 9 table, subtract one group from ten groups. Extend tables beyond memorised values using the distributive property.

Worked example $9 \times 7 = 10 \times 7 - 7 = 63$. Also, $12 \times 8 = 10 \times 8 + 2 \times 8 = 80 + 16 = 96$, and $7 \times 13 = 7 \times 10 + 7 \times 3 = 91$.

7.3 Factors and factor pairs

A positive factor divides a whole number exactly. Find factors in pairs by testing divisors systematically. You can stop looking for new pairs after reaching the square root. A perfect square has a repeated middle pair.

Worked example Factor pairs of 36 are 1×36, 2×18, 3×12, 4×9 and 6×6. Its positive factors are 1, 2, 3, 4, 6, 9, 12, 18 and 36.

7.4 Multiples and common multiples

Multiples result from multiplying by integers. For elementary lists of positive multiples, start with one times the number. Common multiples appear in both lists. Every nonzero whole number has infinitely many positive multiples but only finitely many positive factors.

Worked example Positive multiples of 6 include 6, 12, 18, 24 and 30. Multiples of 8 include 8, 16, 24 and 32. Therefore, 24 is a common multiple of 6 and 8.

7.5 Common factors and useful applications

Common factors divide each of the given numbers exactly. Use them to make equal groups without leftovers. Multiples help with repeating events and common denominators. A factor is usually no greater than a positive number; its positive multiples are no smaller than it.

Worked example The common factors of 18 and 24 are 1, 2, 3 and 6. Eighteen red beads and 24 blue beads can make 6 identical packs, each with 3 red and 4 blue beads.

Chapter 7 practice

Work in your notebook. Show your method and include units where needed.

1. Calculate 8 × 7 and write a related division fact.
2. List all positive factors of 28.
3. Write the first five positive multiples of 9.
4. List the common factors of 12 and 20.
5. Find a common multiple of 5 and 7 below 50.

Answers with methods

1. 8 × 7 = 56, so 56 ÷ 8 = 7.

2. 1, 2, 4, 7, 14 and 28, from the pairs 1 × 28, 2 × 14 and 4 × 7.

3. 9, 18, 27, 36 and 45.

4. Factors common to both are 1, 2 and 4.

5. 35 = 5 × 7, so 35 is a common multiple.

Common mistake to avoid

A factor divides a number. A multiple is obtained by multiplying it. For example, 3 is a factor of 12 and 36 is a multiple of 12.