Properties of operations and the distributive law

MODULE 10 · ALGEBRA — PATTERNS, EXPRESSIONS AND EQUATIONS ALGEBRA

HOW TO ANSWER TODAY

- **Property names.** Order swaps ($a + b = b + a$) → commutative. Brackets move ($(a+b)+c = a+(b+c)$) → associative. One spreads over two ($a(b+c) = ab+ac$) → distributive.

  $5 + 3 = 3 + 5$ → commutative $2 \times (4 + 5) = 2 \times 4 + 2 \times 5$ → distributive

STRETCH PROBLEMS

1. Róisín is feeding ducks at the local pond with 5 bags of crumbs. Each bag covers 13 ducks by the jetty and 13 ducks by the reeds, and she checks that $5 \times (13 + 13) = 5 \times 13 + 5 \times 13$. Which property of operations does this equation show: commutative, associative, or distributive?

2. Cara is packing sandwiches for the 6th class picnic. She notices that four packs each holding 2 cheese and 12 ham sandwiches can be worked out as $4 \times (2 + 12) = 4 \times 2 + 4 \times 12$. Which property of operations does this equation show? Choose commutative, associative, or distributive.

3. During a school tour to the Cliffs of Moher, 3 minibuses each carry 6 boys and 13 girls. The total number of pupils is the same whether worked out as $3 \times (6 + 13)$ or as $3 \times 6 + 3 \times 13$. Which property of operations does this equation show: $3 \times (6 + 13) = 3 \times 6 + 3 \times 13$? (Choose: commutative, associative, or distributive.)

4. After the lunchtime soccer match in the schoolyard, the teacher writes $5 \times (2 + 11) = 5 \times 2 + 5 \times 11$ on the whiteboard for 6th class. Which property of operations does this equation show: commutative, associative, or distributive?

5. In the class library, Aoife counts that 7 shelves each hold 8 story books and 2 poetry books. She writes the equation $7 \times (8 + 2) = 7 \times 8 + 7 \times 2$ to show the total. Which property of operations does this equation show: commutative, associative, or distributive?