

MATH · Y4

# Year 4 Reasoning Pack

30 mixed-topic problems for fluency, reasoning and problem solving

## How to use this pack

These 30 questions are arranged in three sets of 10. Set 1 is fluency — questions where you apply a known method. Set 2 is reasoning — questions that need explanation or comparison. Set 3 is problem solving — multi-step questions you need to think through. Most can be done with a bar model. Children can work through one set at a time, or pick a few from each set as practice. Answer key is at the back.

## Set 1: Fluency

1. What is  $4,532 + 1,876$ ?
2. What is  $9,000 - 4,567$ ?
3. What is  $7 \times 8$ ?
4. What is  $56 \div 7$ ?
5. Round 4,367 to the nearest 100.
6. What is  $\frac{1}{4}$  of 60?
7. 3:45 plus 1 hour 20 minutes is what time?
8. What is  $4.5 + 2.7$ ?
9. What is  $6 \times 9$ ?
10. Half of 246 is what?

## Set 2: Reasoning



1. 1. Sam says  $\frac{1}{2}$  is the same as  $\frac{4}{8}$ . Is he right? Explain why.
2. 2. Which is larger:  $\frac{3}{4}$  or  $\frac{5}{8}$ ? How do you know?
3. 3. Round 4,567 to the nearest 100, then nearest 1000. Why are the answers different?
4. 4. Which has more zeros: one thousand multiplied by ten, or ten thousand?
5. 5. Tom says 'all even numbers can be divided by 4'. Is he right? Give an example.
6. 6. Maya says ' $6 \times 8$  must equal  $8 \times 6$ '. Why is she right?
7. 7. What is the next number in the pattern 4, 9, 14, 19, \_\_\_?
8. 8. The answer is 24. Write three different multiplications that give 24.
9. 9. Which is bigger:  $\frac{1}{2}$  of 24 or  $\frac{1}{3}$  of 30?
10. 10. Sam read the time as 'twenty to seven'. What is this on a 24-hour clock if it's morning?

### Set 3: Problem solving

1. 1. There are 32 children in the class.  $\frac{1}{4}$  walk to school. The rest come by bus or car. 12 come by car. How many come by bus?
2. 2. A pencil costs 35p. A pen costs twice as much. How much for 4 pens?
3. 3. The school day starts at 8:55am and ends at 3:25pm with 75 minutes of breaks. How long is the actual teaching time?
4. 4. A water tank holds 60 litres. It loses  $\frac{1}{4}$  of its water in a day. How much water is left after 2 days?
5. 5. A train leaves at 09:35 and the journey takes 2 hours 50 minutes. What time does it arrive?
6. 6. There are 144 sweets in a bag. They are shared equally between 8 children. Then each child gives half their sweets to a friend. How many sweets does each friend get?
7. 7. Tom is 9 years old. His sister is 4 years younger. His mum is 5 times the sister's age. How old is mum?
8. 8. A school orders 5 boxes of pencils. Each box has 24 pencils. They give  $\frac{1}{3}$  to each Year group. There are 4 Year groups taking pencils. Are there enough? Show your working.
9. 9. A pizza is cut into 8 pieces. Sam eats 3 pieces. Maya eats  $\frac{1}{4}$  of the pizza. How many pieces are left?



10. 10. A bus has 48 seats. At the first stop  $\frac{3}{4}$  are filled. At the next stop 5 people get off and 12 get on. How many seats are filled now?

## Answer key

Set 1: 1. 6,408 2. 4,433 3. 56 4. 8 5. 4,400 6. 15 7. 5:05 8. 7.2 9. 54 10. 123

Set 2: 1. Yes —  $\frac{1}{2} = \frac{4}{8}$  (multiply numerator and denominator by 4). 2.  $\frac{3}{4} = \frac{6}{8}$ , which is bigger than  $\frac{5}{8}$ . 3. 4,600 to nearest 100; 5,000 to nearest 1000 (different precision). 4. They're equal — both = 10,000. 5. No — 6 is even but not divisible by 4. Counterexample: 6, 10, 14. 6. Multiplication is commutative — order doesn't matter. 7. 24. 8. e.g.  $4 \times 6$ ,  $3 \times 8$ ,  $2 \times 12$ . 9.  $\frac{1}{2}$  of 24 = 12;  $\frac{1}{3}$  of 30 = 10. So  $\frac{1}{2}$  of 24 is bigger. 10. 06:40.

Set 3: 1. 12 (32 - 8 walking - 12 by car = 12 bus). 2.  $70p \times 4 = \text{£}2.80$ . 3. 6h 30m total - 1h 15m breaks = 5h 15m teaching. 4.  $60 - 15 = 45$  after day 1;  $45 - 11.25 = 33.75$  litres. (Or argue 'a quarter of remaining' = 33.75 if 'lose a quarter' applies to current amount each day.) 5. 12:25. 6. 9 sweets each. 7. 25 (sister is 5, mum = 25). 8. Total 120 pencils;  $\frac{1}{3}$  each = 40 each;  $4 \times 40 = 160$ . Not enough by 40. 9. 3 pieces left ( $3 + 2 = 5$  eaten of 8). 10.  $36 - 5 + 12 = 43$  filled.

