CALCULATIONS

Use checking procedures, including working the problem backwards and considering whether the result is the right order of magnitude

Use the context of a problem to check whether an answer is sensible. For example:

- Check that the sum of two odd numbers, positive or negative, is an even number.
- When multiplying two large numbers together, check the last digit, e.g. 239×46 must end in a '4' because $6 \times 9 = 54$.
- Having multiplied a number by, for example, 3, the sum of the digits should be divisible by 3.

Discuss questions such as:

- A girl worked out the cost of 8 bags of apples at 47p a bag. Her answer was £4.06.
  Without working out the answer, say whether you think it is right or wrong.
- A boy worked out how many 19p stamps you can buy for £5. His answer was 25.
  Do you think he was right or wrong? Why?
- I buy six items costing 76p, 89p, 36p, £1.03, 49p and 97p. I give the shop assistant a £10 note and get £3.46 change. I immediately think the change is wrong. Without calculating the sum, explain why you think I am right.
- A boy worked out £2.38 + 76p on a calculator. The display showed 78.38.
  Why did the calculator give the wrong answer?

Use rounding to approximate and judge whether the answer is the right order of magnitude. For example:
- $2605 - 1897$ is about $3000 - 2000$
- 245×19 is about 250×20
- $786 \div 38$ is about $800 \div 40$
- 12% of 192   is about 10% of 200
- 1.74×16 lies between $1 \times 16 = 16$ and $2 \times 16 = 32$

Check by doing the inverse operation.
For example, use a **calculator** to check:
- $43.2 \times 26.5 = 1144.8$ with $1144.8 \div 43.2$
- $\frac{3}{5}$ of $320 = 192$ with $192 \times 5 \div 3$
- $3 \div 7 = 0.428\,5714\ldots$ with 7×0.4285714

Check by doing an equivalent calculation.
For example, check:
- $592 \times 9 = 5328$ with $(600 - 8) \times 9 = 5400 - 72$
                         or $592 \times (10 - 1) = 5920 - 592$
- $44 \times 99 = 4356$ with $44 \times (100 - 1) = 4400 - 44$
                         or $(40 + 4) \times 99$ $= 3960 + 396$

See Y456 examples (pages 72–3).

Link to making estimates and approximations of calculations (pages 102–3).