

NUMBER

Checking results

Pupils should learn to:	As outcomes, Year 7 pupils should, for example:
<p>Use checking procedures, including working the problem backwards and considering whether the result is the right order of magnitude</p>	<p>Use the context of a problem to check whether an answer is sensible. For example:</p> <ul style="list-style-type: none"> • 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. <p>Discuss questions such as:</p> <ul style="list-style-type: none"> • 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? <p>Use rounding to approximate and judge whether the answer is the right order of magnitude. For example:</p> <ul style="list-style-type: none"> • $2605 - 1897$ 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 $2 \times 16 = 32$ <p>Check by doing the inverse operation. For example, use a calculator to check:</p> <ul style="list-style-type: none"> • $43.2 \times 26.5 = 1144.8$ with $1144.8 \div 43.2$ • $\frac{3}{5}$ of 320 = 192 with $192 \times 5 \div 3$ • $3 \div 7 = 0.428\ 571\ 4\dots$ with $7 \times 0.428\ 571\ 4$ <p>Check by doing an equivalent calculation. For example, check:</p> <ul style="list-style-type: none"> • $592 \times 9 = 5328$ 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 $(40 + 4) \times 99 = 3960 + 396$ <p>Link to making estimates and approximations of calculations (pages 102–3).</p>

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As outcomes, Year 8 pupils should, for example:

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

- When calculating a mean, check that it is within the range of the data. For example, the mean of 34, 21, 65, 89, 43, 29, 76, 79 must lie between 21 and 89.
- When using measurements, check the magnitude of the answer in the context of the problem.

Discuss questions such as:

- Will the answer to $75 \div 0.9$ be smaller or larger than 75?
- A class of pupils was asked whether they preferred pop or classical music. They said:

Prefer classical	21%
Prefer pop	67%
Don't know	13%

 All results are correct to the nearest per cent but the three percentages add to 101%.
 Is this possible?
- Without using a calculator, pick out a possible answer to the calculation. Explain your choice.
 - 47×59
3443 or 2773 or 2887
 - 456×0.48
218.9 or 636 or 322.7

Use rounding to approximate and judge whether the answer is the right order of magnitude. For example:

- $\sqrt{7}$ lies between $\sqrt{4}$ and $\sqrt{9}$
i.e. between 2 and 3
- Round to the nearest ten, e.g.
 6% is approximately 6% = 6.
- Round to 'nice' numbers, e.g.
 6% is approximately 6% = 7.

Check by doing the inverse operation.

For example, use a calculator to check:

- $\sqrt{7} = 2.64575\dots$ with $(2.64575)^2$

Link to making estimates and approximations of calculations (pages 102–3), and checking the solution of an equation by substitution (pages 122–5).

As outcomes, Year 9 pupils should, for example:

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

Discuss questions such as:

- The price of an audio system is reduced by 10%. Two months later the price increases by 10%. It does not return to its original price. Is this possible?
- Without using a calculator, pick out a possible answer to the calculation from the three possible answers given.
 - $(398)^2$
158 404 or 6344 or 161 484
 - $365 \div 0.43$
849 or 84.9 or 157
 - $67 \div 0.083$
87.2 or 8.72 or 807.2
 Explain your choice in each case.
- *Can a square have an exact area of 32 cm^2 ? What about a circle?*

Link to making estimates and approximations of calculations (pages 102–3), checking the solution of an equation by substitution (pages 122–5), and checking that the sum of probabilities for all outcomes is 1 (pages 278–9).