

Place value and estimation

Pearson Edexcel GCSE Mathematics 1MA1 • L003

Foundation and Higher • Lesson resources

REACH FOR THE STAR | GCSE MATHEMATICS

Purpose

Use place value to scale and compare decimals, round to stated accuracy, and judge whether a calculation is reasonable.

Vocabulary

Decimal place: position after the decimal point. Significant figure: a digit counted from the first non-zero digit. Estimate: an approximate calculation. Approximately equal: $\approx$. Placeholder zero: a zero that preserves position or stated accuracy.

Why the method works

In 4.063, the digits represent 4 ones, 0 tenths, 6 hundredths and 3 thousandths. Multiplying by ten makes each digit's value ten times as large; the decimal point marks the boundary between ones and tenths. Pad decimals with trailing zeros to compare equal places: $0.6 = 0.60 > 0.56$.

Method and checking

For rounding, identify the retained place and inspect the next digit. At 5 or above, increase the retained digit; otherwise keep it. Carry where needed. For significant figures, begin at the first non-zero digit. Estimate by replacing awkward numbers with convenient approximations, then compare the scale and units of the result.

Common errors and next attempt

Scaling error: label a place-value chart and track each digit, rather than counting arbitrary zeros. Comparison error: pad trailing zeros. Rounding error: mark the retained place and decision digit. Estimate error: write the rounded expression before calculating. Recheck $0.47 \times 100 = 47$; $0.6 > 0.58$; 8.476 to 2 d.p. = 8.48; $39.6 \div 0.81 \approx 40 \div 0.8 = 50$.