

Estimation

When finding an estimate, pupils should know that:

- it is possible to find different estimates that are equally valid
- different mental strategies can be used to find an estimate.

Steps 1 to 3: Two-digit \times one-digit

These simple multiplications can be carried out mentally without the need for estimates. For example, in Step 1, 23×3 can be partitioned mentally as 20×3 and 3×3 to give 60 and 9 and an (exact) answer of 69.

Steps 4, 5, 8, 9 and 10: Three-digit \times one-digit

The example in Step 8 is 258×3 . Here are three approaches.

Pupil A	Pupil B	Pupil C
<p><i>I will round to the nearest hundred.</i></p> <p><i>I think of 300×3.</i></p> <p><i>My estimate is 900.</i></p>	<p><i>I will use 250 as an approximate value because it an easy number to handle mentally.</i></p> <p><i>I think of $25 \times 3 = 75$.</i></p> <p><i>My estimate is 750.</i></p>	<p><i>258 lies between 200 and 300.</i></p> <p><i>So 258 lies between 200×3 and 300×3.</i></p> <p><i>I estimate that the answer lies between 600 and 900.</i></p>

The exact answer is 774.

Step 16: Three-digit \times any two-digit multiple of 10

The example in Step 16 is 638×40 . This method rounds 638 to 600 and then partitions as $6 \times 100 \times 4 \times 10$.

A pupil may say:

I will round 638 to the nearest 100 to get 600.

I now need 600×40 .

I take the hundred out of the 600 and the ten out of the 40. That gives $100 \times 10 = 1000$

I now have $6 \times 4 = 24$.

So my estimate is 24 thousand or 24 000.

The exact answer is 25 520.