Know and use mental multiplication and division strategies for integers

1 Whitney is working out 13 × 7 mentally.

> First I multiplied 10 × 7 = 70

> Then I multiplied 3 × 7, which is 21

> Then I added 70 and 21 to get 91. So 13 × 7 = 91

Use Whitney's method to work out the calculations.

For parts a) and b), write the steps you followed.

a) 16 × 5 = **80**

e.g.

> 10×5=50

> 6×5 = 30

> 50 + 30 = 80

b) 24 × 3 = **72**

e.g.

> 20×3=60

> 4 × 3 =12

> 60+12=72

c) 19 × 8 = **152**

e) 7 × 23 = **161**
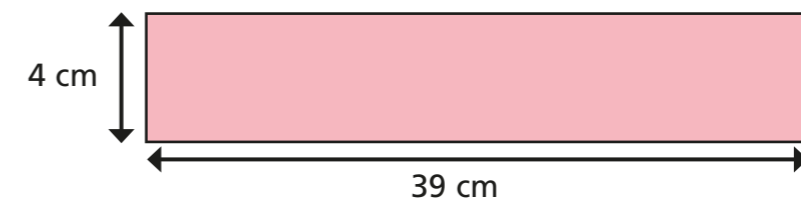
d) 3 × 35 = **105**

f) 15 × 9 = **135**

2 Ms Xu needs to buy 15 tiles.

She can buy a pack of 15 or she can buy them individually.

£7   £120
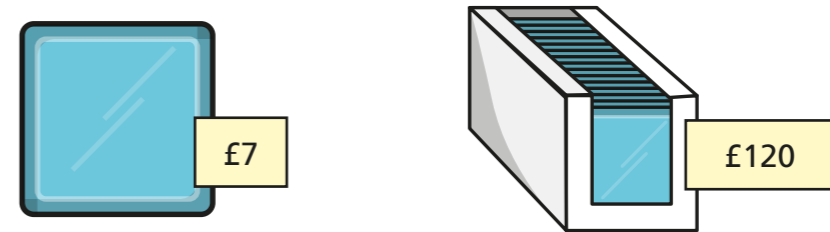
a) By doing a quick mental calculation, is it cheaper to buy the pack of 15? **No**

b) Explain why mental arithmetic might help in everyday life.

3 Here is a rectangle.

4 cm

39 cm

Describe a mental method you could use to work out the area of the rectangle.

e.g.   4 cm × 39 cm = (4 cm × 40 cm) − (4 cm × 1 cm)

= 160 cm² − 4 cm² = 156 cm²

Compare your method with a partner's.

4 Here are some multiplications.

Work them out mentally.

60 × 4	600 × 4	400 × 60
240	2,400	24,000

Talk about your method with a partner.

5 Here is a method to work out 99 × 7 mentally.

> Step 1: Multiply 100 by 7 = 700
>
> Step 2: Subtract 7 from 700 = 693

a) Explain to a partner why this method works.

b) Work out 98 x 7 mentally. Then write the steps in your thinking.

686

c) Work out 199 x 3 mentally. Then write the steps in your thinking.

597

6 Work out the multiplications mentally.
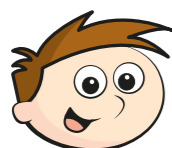
a) 99 × 4 = 396

d) £97 × 3 = £291

b) 99 × 12 = 1,188

e) 5 × 199 = 995

c) £98 × 3 = £294

f) 299 × 6 = 1,794

7 Teddy is explaining how he worked out 600 ÷ 25 in his head.

> There are 4 lots of 25 in 100. I then multiplied 4 by 6 to get 24. So 600 divided by 25 is 24

Why did Teddy multiply by 6 to get the answer?

There are 6 lots of 100 in 600

8 Use a similar method to Teddy's to work out the divisions.

a) 300 ÷ 25 = 12

e) 1,000 ÷ 25 = 40

b) 300 ÷ 20 = 15

f) 1,000 ÷ 20 = 50

c) 400 ÷ 50 = 8

g) 4,000 ÷ 25 = 160

d) 900 ÷ 50 = 18

h) 2,000 ÷ 50 = 40

9 **a)** Explain how you can mentally work out £240 ÷ 6

e.g.   £24 ÷ 6 = £4   so   £240 ÷ 6 = £40

10 Use mental methods to work out the divisions.

450 ÷ 9 = 50

£640 ÷ 8 = £80

630 ÷ 7 = 90

350 ÷ 5 = 70

3,200 kg ÷ 4 = 800 kg

7,200 g ÷ 12 = 600g