

Multiply decimals by integers

Notes and guidance

In this small step, children multiply numbers with up to 2 decimal places by integers other than 10, 100 and 1,000 for the first time.

Children look at related multiplication facts using concrete resources such as place value counters, exploring relationships such as $3 \times 2 = 6$ and $0.3 \times 2 = 0.6$, and $5 \times 5 = 25$ and $0.5 \times 5 = 2.5$. They then multiply numbers with up to 2 decimal places by 1-digit integers using rows of place value counters, exchanging when needed. This is a good opportunity to explore calculations with money.

Most of the learning focuses on multiplying by a 1-digit number, but it may be appropriate to explore methods for multiplying by a 2-digit number, for example partitioning the integer and using knowledge of multiplying by 10 to support the workings:

$$0.4 \times 14 = (0.4 \times 10) + (0.4 \times 4).$$

Things to look out for

- Children may make mistakes with exchanges where decimals are involved, for example thinking that $0.5 \times 3 = 0.15$
- When using related facts to multiply decimals, children may put the answer as 100 times smaller instead of 10 times smaller, for example $1.2 \times 3 = 0.36$

Key questions

- What is an integer?
- If you know $3 \times 2 = 6$, what else do you know?
- How can you show multiplying decimals by integers using counters?
- How is multiplying decimal numbers similar to/different from multiplying whole numbers?
- Do you have enough hundredths/tenths/ones to make an exchange?

Possible sentence stems

- I need to exchange 10 _____ for 1 _____
- I know that _____ \times _____ = _____, so I also know that _____ \times _____ = _____
- _____ multiplied by _____ is equal to _____

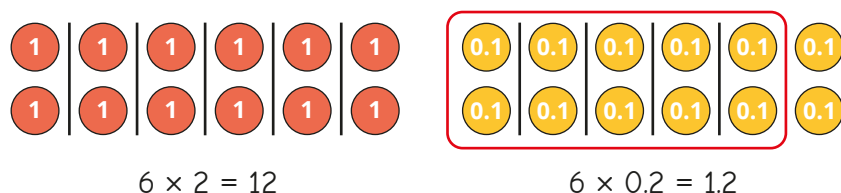
National Curriculum links

- Multiply 1-digit numbers with up to 2 decimal places by whole numbers

Multiply decimals by integers

Key learning

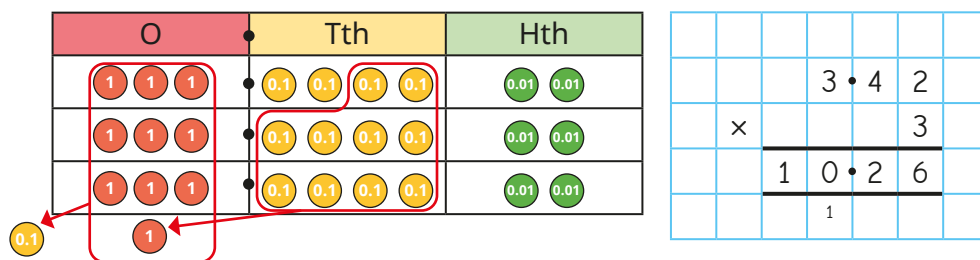
- Dora uses place value counters to show that 6 lots of 2 is 12, and 6 lots of 0.2 is 1.2



Use Dora's method to complete the calculations.

- 4×2 5×5 3×4 12×3
 4×0.2 0.5×5 3×0.4 1.2×3

- Dexter uses place value counters to work out 3.42×3



Use Dexter's method to work out the multiplications.

2.31×4

3.75×3

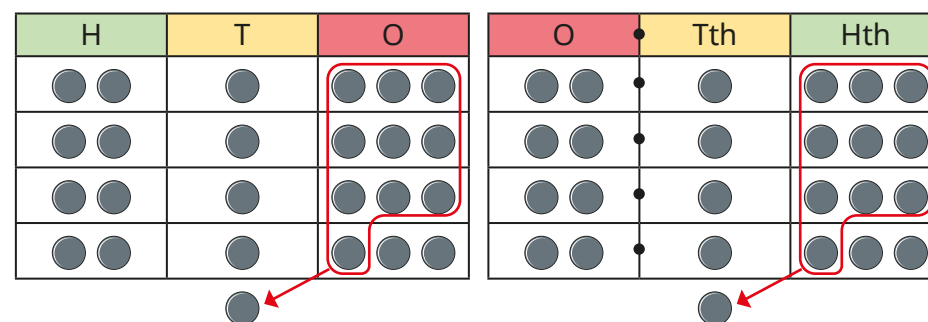
0.55×2

1.08×3

- Aisha and Filip are using counters to work out multiplications.

Aisha: $213 \times 4 = 852$

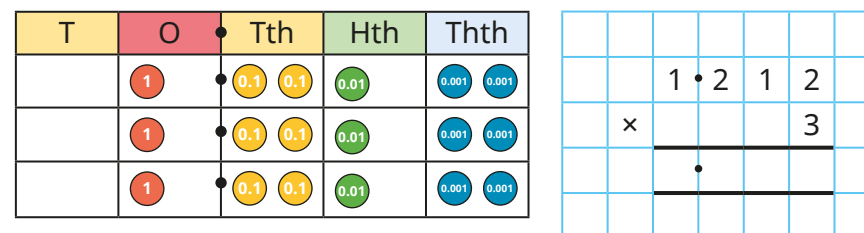
Filip: $2.13 \times 4 = 8.52$



What is the same and what is different about their calculations?

- Use the place value counters to multiply 1.212 by 3

Complete the calculation.



- Use place value counters and a formal written multiplication to work out the calculations.

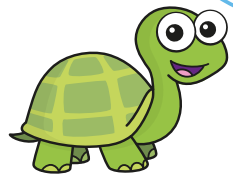
2.121×4

0.613×5

4.056×3

Multiply decimals by integers

Reasoning and problem solving



I know that
 $25 \times 4 = 100$,
so $0.25 \times 4 = 0.100$

Do you agree with Tiny?
Explain your answer.

No

Is the statement always true, sometimes true or never true?

When you multiply a number with 2 decimal places by an integer, the answer will have 2 decimal places.

Explain your answer.

sometimes true

Chocolate eggs can be bought individually, or in packs of 6 or 8



1 egg
52p



6 eggs
£2.85



8 eggs
£4

four packs of 6 plus
an individual egg

£11.92

What is the cheapest way for Max to buy 25 chocolate eggs?

How much will he spend?