Multiply by 10, 100 and 1,000

Notes and guidance

In Year 5, children multiplied numbers with up to 2 decimal places by 10, 100 and 1,000. This small step extends to numbers with up to 3 decimal places.

Children use place value counters to represent multiplying a decimal number by 10, leading to an exchange being needed. Children see that when multiplying by 10, they exchange for a counter that goes in the place value column to the left. Children then explore how multiplying by 100 is the same as multiplying by 10 and then 10 again, so digits move two place value columns to the left. Finally, they look at multiplying by 1,000

A Gattegno chart and plain counters in a place value chart are also used to help children with their understanding.

Things to look out for

- Children may add a zero when multiplying a decimal number by 10, or two zeros when multiplying by 100, for example 5.13 × 10 = 5.130

- Children may think of the multiplication as moving the decimal point, but it is important to refer to the digits moving instead as they become, for example, 10 times greater.

Key questions

- How can you represent multiplying a decimal number with place value counters?

- What number is 10 times the size of _____?

- What number is 100 times the size of _____?

- What number is 1,000 times the size of _____?

- How can you multiply decimal numbers using a Gattegno chart?

- How can you use counters on a place value chart to multiply numbers by 10/100/1,000?

Possible sentence stems

- _____ is 10/100/1,000 times the size of _____

- _____ is one-tenth/hundredth/thousandth the size of _____

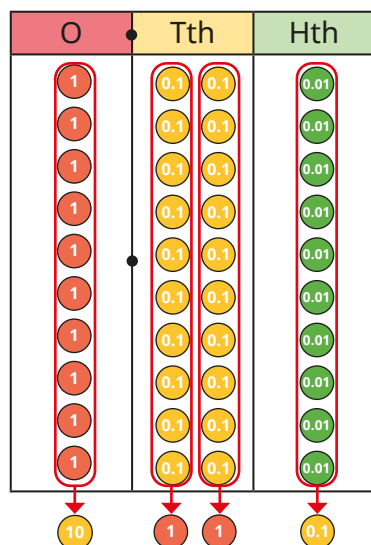- To multiply by _____, I move the digits _____ places to the _____

National Curriculum links

- Identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places

Multiply by 10, 100 and 1,000

Key learning

- Tommy uses place value counters to multiply 1.21 by 10

> 1.21 × 10 = 12.1
> 12.1 is 10 times the size of 1.21
> 1.21 is one-tenth the size of 12.1

Use Tommy's method to work out the calculations and complete the sentences for each one.

| 2.43 × 10 | 1.05 × 10 | 0.03 × 10 | 4.1 × 10 |

_____ × 10 = _____

_____ is 10 times the size of _____

_____ is one-tenth the size of _____

- Jack uses a Gattegno chart to work out that 0.46 × 100 = 46

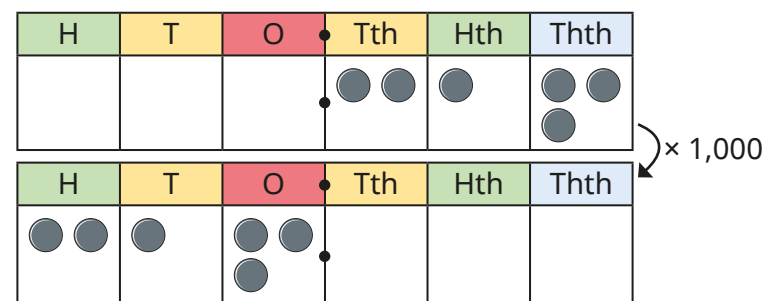| 10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

Use a Gattegno chart to work out the calculations.

▶ 0.19 × 100   ▶ 2.05 × 100   ▶ 1.513 × 100

- Nijah multiplies 0.213 by 1,000 using a place value chart.

> 0.213 × 1,000 = 213
> 213 is 1,000 times the size of 0.2130.123 is one-thousandth the size of 213

Use Nijah's method to work out the calculations.

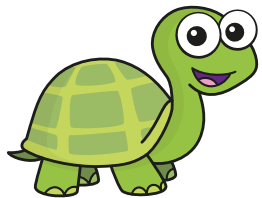| 0.32 × 1,000 | 0.298 × 1,000 | 1.045 × 1,000 | 5.407 × 1,000 |

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Reasoning and problem solving

Tiny is multiplying numbers by 100

> When you multiply by 100, you just add two zeros to the end of the number.

Give an example of a calculation where Tiny's method works.

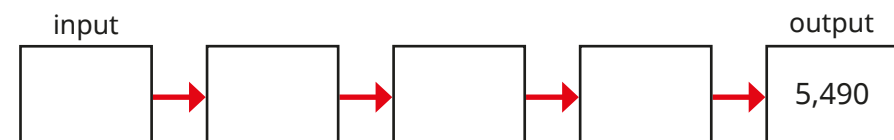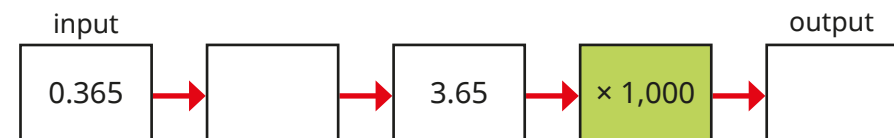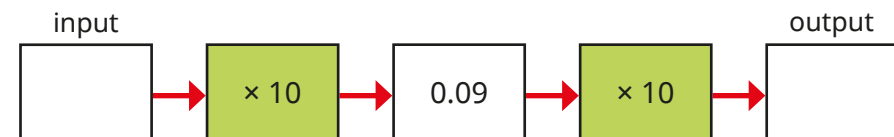Give an example of a calculation where Tiny's method does **not** work.
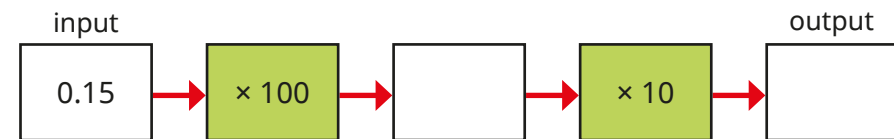
What is a better way to explain how to multiply by 100?

Talk about it with a partner.

e.g. 3 × 100

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e.g. 0.3 × 100

Fill in the missing numbers.

input: 0.15 → × 100 → ☐ → × 10 → output ☐

input: ☐ → × 10 → 0.09 → × 10 → output ☐

input: 0.365 → ☐ → 3.65 → × 1,000 → output ☐

input: ☐ → ☐ → ☐ → ☐ → output 5,490

15, 150

———

0.009, 0.9

———

× 10, 3,650

multiple possible answers, e.g.
0.549, × 10, 5.49, × 1,000

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