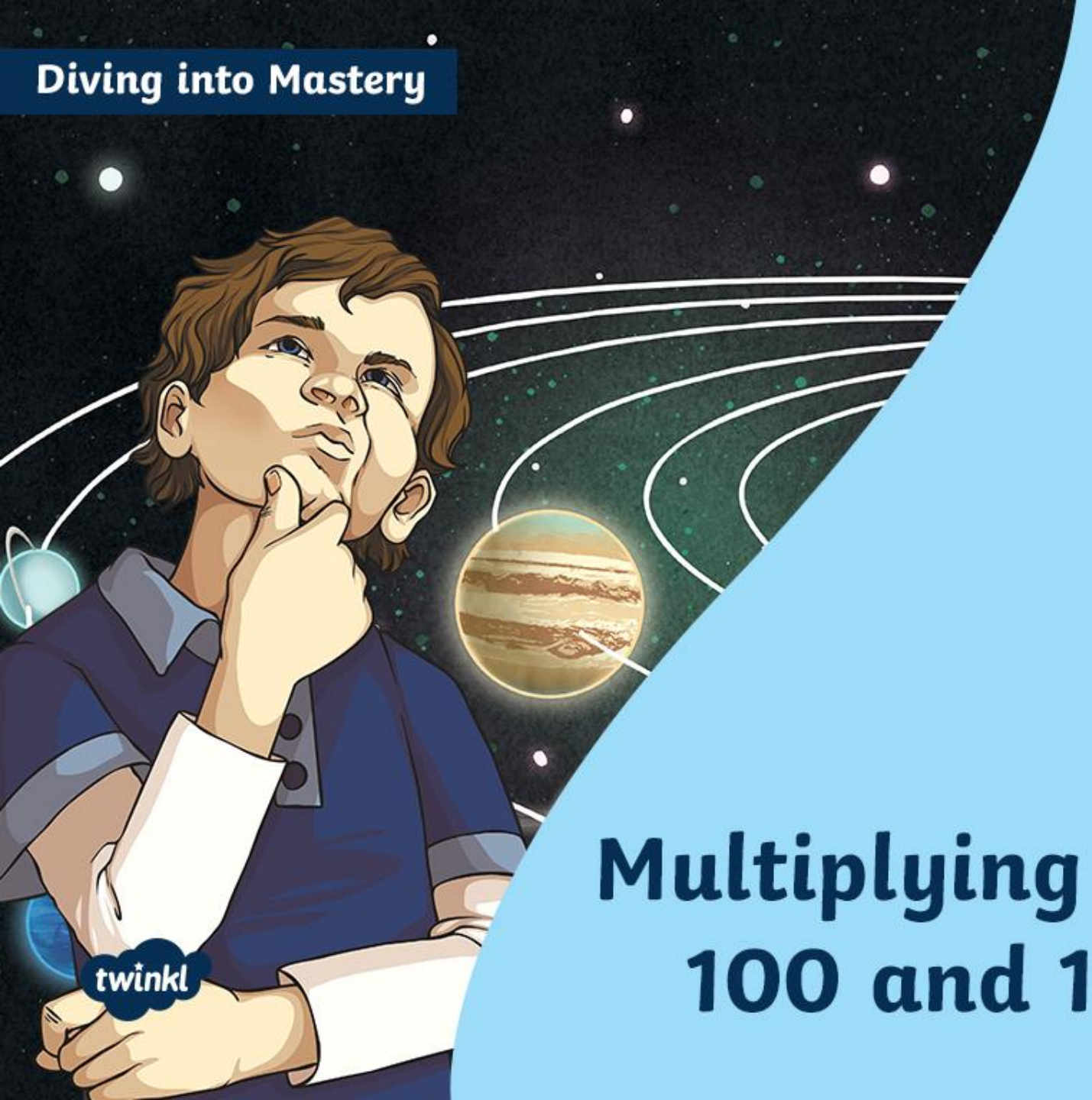
Diving into Mastery



# Multiplying by 10, 100 and 1000

# Diving into Mastery Guidance for Educators

Each activity sheet is split into three sections, diving, deeper and deepest, which are represented by the following icons:

Diving

Deeper

Deepest

These carefully designed activities take your children through a learning journey, initially ensuring they are fluent with the key concept being taught; then applying this to a range of reasoning and problem-solving activities.

These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.

# Aim

- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.

## Multiplying by 10, 100 and 1000 | Diving

**What number is shown on the place value chart?**

| HTh | TTh | Th | H | T | O |
|---|---|---|---|---|---|
| | | | ●● ●● | ●●● ●●● | ●●●● ●●●● |

**468**

**Complete the sentences:**

If I multiply this number by 10, it becomes **4680**.
The digits move **one** place to the **left**.
I need to put a **zero** in the empty column to act as a **place holder**.

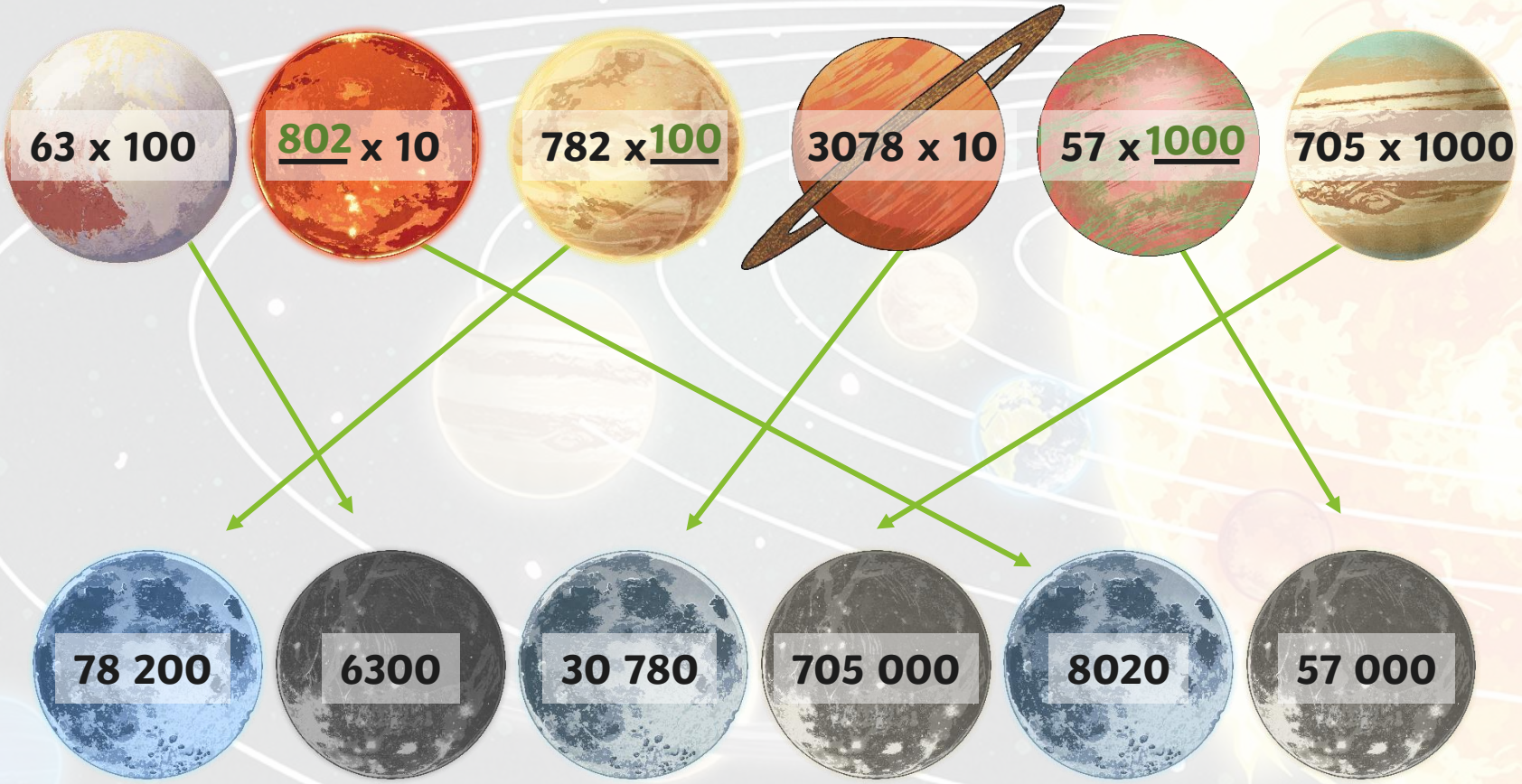
If I multiply this number by 100, it becomes **46 800**.
The digits move **two** places to the **left**.

If I multiply this number by 1000, it becomes **468 000**.
The digits move **three** places to the **left**.

## Multiplying by 10, 100 and 1000

Diving

Match each planet to its moon to complete the calculation.



## Multiplying by 10, 100 and 1000 — Deeper

Jim says, “To multiply by 100, I just add two zeros.”

Kiera says, “I times by 10 and then times by 10 again.”

Do you agree with Jim and Kiera’s methods for multiplying by 100? Explain your thinking.

*Jim should have said that the digits move two places to the left. If you are multiplying a decimal number by 100, for example 3.5 × 100, adding two zeros results in 3.500 and not 350. If any columns on the right of the digits have become empty, they will need a place holder.*

*Kiera’s method is correct as 10 × 10 = 100.*
*It is the same as multiplying by 100.*

## Multiplying by 10, 100 and 1000 | Deeper

Using the clues below, can you work out the diameter of these new planets?

Vesta is 100 times bigger than Athena.

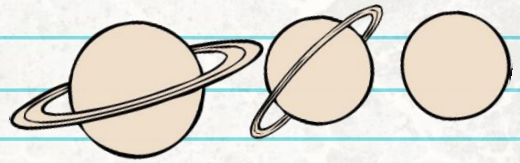
Athena has half the diameter of Vulcan.

Juno is 10 times bigger than Athena.

Ceres is 100 times bigger than Vulcan.

Vulcan is 3624km in diameter.

Apollo is 1000 times bigger than Athena.



Vulcan – 3624km

Athena – 1812km

Juno – 18 120km

Ceres – 362 400km

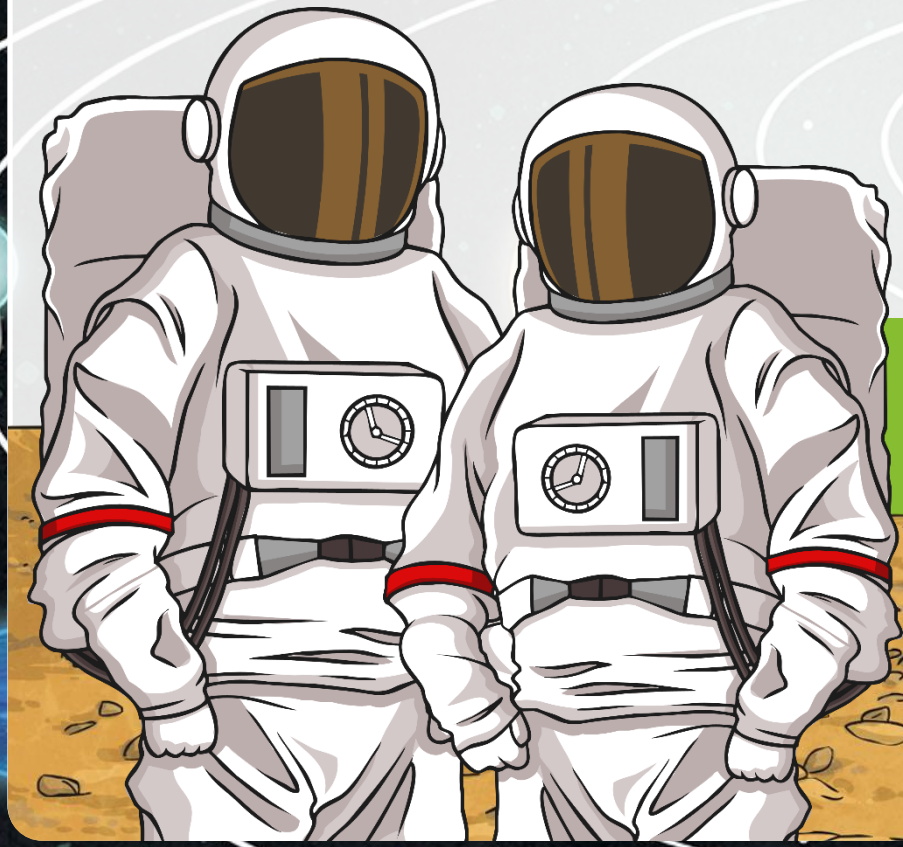
Vesta – 181 200km

Apollo – 1 812 000km

## Multiplying by 10, 100 and 1000 — Deeper

Alan and Astrid, the astronauts, are exploring the new planet, Vulcan.

Alan has travelled 605 steps. Astrid has travelled 100 times more steps and then walked another 550 steps. How many steps has she travelled?



$605 \times 100 = 60\,500$

$60\,500 + 550 = 61\,050$

She has travelled 61 050 steps.

## Multiplying by 10, 100 and 1000 | Deepest

Astrid has discovered a crater a certain number of steps away from the shuttle. The number has 3 digits. She says that when this number is multiplied by 1000, the hundred thousands and ten thousands digits are the same. Also, the product of the number's digits is 8.

How many steps from the shuttle is the crater? Find both possibilities.

The crater is either 118 steps or 222 steps away from the shuttle.

## Multiplying by 10, 100 and 1000 | Deepest

What could the values of A and B be? Find 3 possible solutions.

$A \times 1000 = B + 800$

Possible solutions include the following:

A = 4  B = 3200

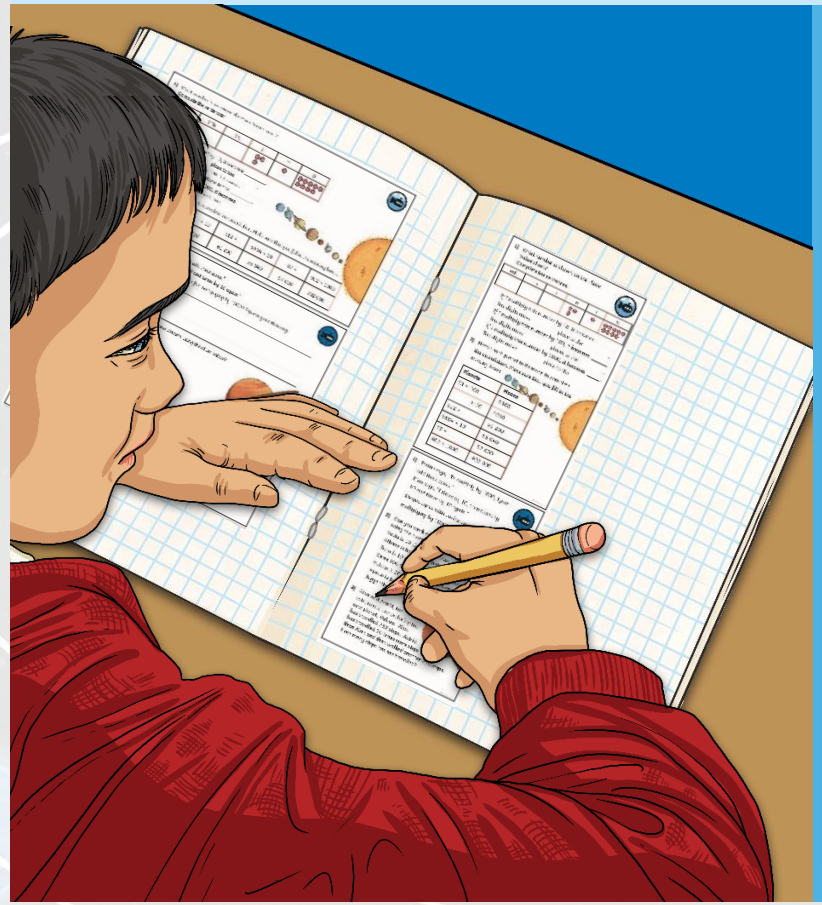
A = 65  B = 64 200

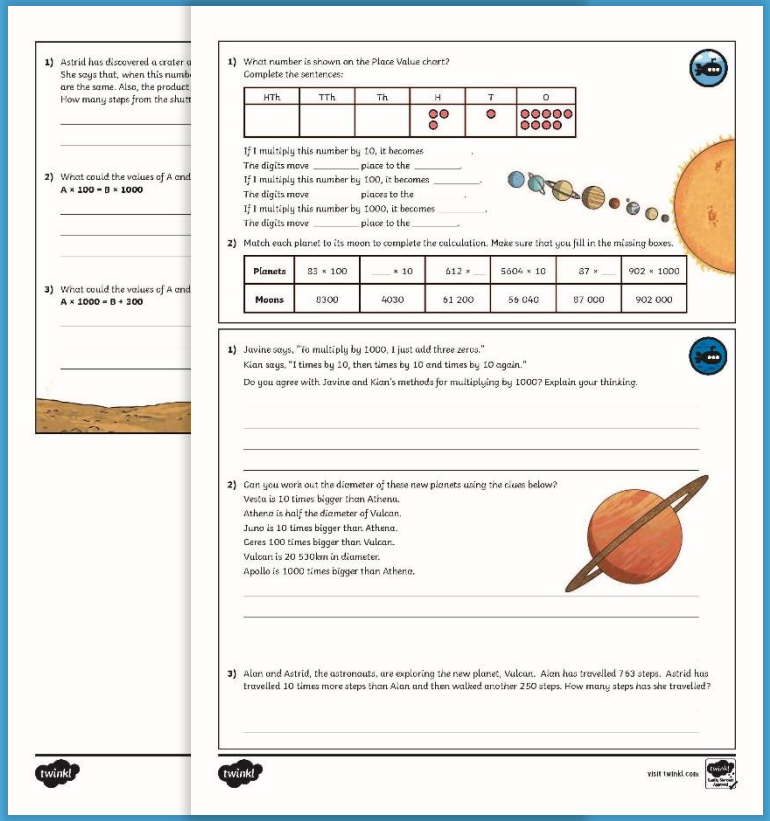
A = 82  B = 81 200

(B should be 100 times greater than A.)

# Multiplying by 10, 100 and 1000

## Dive in by completing your own activity!





1) What number is shown on the Place Value chart?
Complete the sentences:

| HTh | TTh | Th | H | T | O |
|---|---|---|---|---|---|
| | | | ●● | ● | ●●●●● |

If I multiply this number by 10, it becomes _____.
The digits move _____ place to the _____.
If I multiply this number by 100, it becomes _____.
The digits move _____ places to the _____.
If I multiply this number by 1000, it becomes _____.
The digits move _____ place to the _____.

2) Match each planet to its moon to complete the calculation. Make sure that you fill in the missing boxes.

| Planets | 83 × 100 | ____ × 10 | 612 × ____ | 5604 × 10 | 87 × ____ | 902 × 1000 |
|---|---|---|---|---|---|---|
| Moons | 8300 | 4030 | 61 200 | 56 040 | 87 000 | 902 000 |

1) Javine says, "To multiply by 1000, I just add three zeros."
Kian says, "I times by 10, then times by 10 and times by 10 again."
Do you agree with Javine and Kian's methods for multiplying by 1000? Explain your thinking.

2) Can you work out the diameter of these new planets using the clues below?
Vesta is 10 times bigger than Athena.
Athena is half the diameter of Vulcan.
Juno is 10 times bigger than Athena.
Ceres 100 times bigger than Vulcan.
Vulcan is 20 530km in diameter.
Apollo is 1000 times bigger than Athena.

3) Alan and Astrid, the astronauts, are exploring the new planet, Vulcan. Alan has travelled 763 steps. Astrid has travelled 10 times more steps than Alan and then walked another 250 steps. How many steps has she travelled?

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