

## Why Use a Number Slide?

### Number slides:

- are an efficient way of teaching students what happens when numbers are multiplied or divided by a power of 10 (positive powers 10, 100, 1000, or negative powers 0.1, 0.01, 0.001).
- help students to realise that there is nothing “magical” happening when multiplying or dividing numbers with a power of 10; simply put, the digits move or “slide” to a new place without changing.
- show students a consistent method for multiplying or dividing by powers of 10 throughout the year levels. Number slides have the advantage of showing:

- ◇ that it is the digits that are moving to a new place, not the decimal point moving.
- ◇ that digits stay together in the same order as they slide. There are no gaps added at any time. Zeros are not added unless they are needed to “hold a place”

- ◇ t
- ◇ t
- ◇ t
- \* V
- \* V
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- t

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- erals slide
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### Traps to avoid when teaching multiplying or dividing by powers of 10

- **“Adding a zero”** (or crossing one off); while it works well for whole numbers in the earlier years, it **does not** work when decimals are included in later years. It is a misleading method, which needs “reteaching” later, when decimals are introduced.  
This approach is very confusing for students and can result in common errors such as:  
$$2.5 \times 10 = 20.5 \quad \mathbf{X}$$
- **“Moving the decimal point”** is also mathematically incorrect. Decimal points don’t move, the digits do.

Sequence for teaching with the *Number Slide Gadget*

This Gadget covers a large number of activities that span multiple year levels.

The activities range from basic multiplying of whole numbers by ten, to dividing decimals numbers by decimals.

These lessons, listed below, have been sequenced from the very basic to the most difficult.

- Multiplying whole numbers
  - ◊ x 10
  - ◊ x 100
  - ◊ x 1000
- Dividing whole numbers
  - ◊ ÷ 10
  - ◊ ÷ 100
  - ◊ ÷ 1000
- Multiplying decimals
  - ◊ x 0.1
  - ◊ x 0.10
  - ◊ x 0.100
- Dividing decimals
  - ◊ ÷ 0.1
  - ◊ ÷ 0.10
  - ◊ ÷ 0.100
- Rounding
- Rounding
- Conversion
  - ◊ cm : m
  - ◊ g : kg
  - ◊ mL : L

The screenshot shows the 'NUMBER SLIDE' gadget interface. At the top, there are labels for place values: M, HT, TT, T, U. Below these are five boxes, with the last two containing the digits '4' and '3'. To the right of the boxes is a red arrow pointing right. Below the boxes is a small display showing '43'. On the left side, there is a vertical toolbar with various icons for operations and a calculator interface showing '7.89'.



This is a

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49 cm = 0.49 m

The first screenshot shows the number line with '49' in the T and U boxes. The second screenshot shows the number line with '0.49' in the T, U, and H boxes, illustrating the conversion of 49 cm to 0.49 m.

**Multiplying by the positive powers of ten (whole numbers):**

These are the numbers 10, 100, 1000.

The number slide will slide all the digits the required number of places to the left.

The number gets **larger**.

**X**

10

100

1000

M	HTh	TTh	Th	H	T	O	L	h	th
				9	8	7	6	5	

$987.65 \times 10 = 9,876.5$

h	TTh	Th	H	T	O	L	h
			9	8	7	6	5

**Think:**

“Multiplying by whole numbers the number gets **larger**.”

x 10: one place

x 100: two places

x 1000: three places

**Remember:**

“The number of places moved is the same as the number of places in the multiplier.”

**Multiplying**

These are the

The number

The number

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**X** **÷**

10 0.1

100 0.01

1000 0.001

$456.78 \times 0.1 = 45.678$

Th	TTh	H	T	O	L	h	th
			4	5	6	7	8

“Decimals the smaller.”

x 0.001: three places

**Remember:**

“The number of places moved is the same as the number of decimal places”