1. Numbers to 1 000 000



Name _____ Class _____ Date _____

Max and Tim's stop · Sydney · Harbour Bridge. On the sandstone steps beside Sydney Harbour, Max opens the travel journal at page 1 while Tim points up at the great steel arch of the Harbour Bridge.

> **Today:** Every digit has a **place**, and its place says what the digit is **worth**, all the way to one million.

Warm-up Ten of these make one of those

Each answer helps with the next one. Fill in the model, then write the equation.

1 **a)** 10 × 10

	× 10	
groups	1	10
total	10	☐
	× 10	

10 × 10 = _____

b) 10 × 100

	× 10	
groups	1	10
total	100	☐
	× 10	

10 × 100 = _____

c) 10 × 1 000

	× 10	
groups	1	10
total	1 000	☐
	× 10	

10 × 1 000 = _____

d) 10 × 10 000

	× 10	
groups	1	10
total	10 000	☐
	× 10	

10 × 10 000 = _____

e) 10 × 100 000

	× 10	
groups	1	10
total	100 000	☐
	× 10	

10 × 100 000 = _____

f) 999 999 + 1

M	HTh	TTh	Th	H	T	O
	9	9	9	9	9	9

999 999 + 1 = _____

KNOWLEDGE On the place-value chart

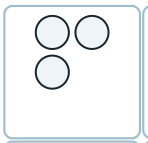
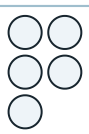
WORKED EXAMPLE **What is the value of the 4 in 241 360?**

HTh	TTh	Th	H	T	O
2	4	1	3	6	0
	40 000				

1. The 4 stands in the ten-thousands place, so it is worth **40 000**.

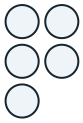
the 4 in 241 360 is worth 40 000

2 ★ **What number is shown in the place-value chart?**

HTh	TTh	Th	H	T	O
					
3	☐	☐	2	4	0

the chart shows _____

3 ★ The chart shows **305 240**. **What will the number be if you add three counters to the ten-thousands column?**

HTh	TTh	Th	H	T	O
					
3	☐	5	2	4	0

305 240 + 30 000 = _____

4 ★ Fill in the model, then write the equation.

a) What is the value of the **7** in **372 465**?

HTh	TTh	Th	H	T	O
3	7	2	4	6	5

the 7 is worth ☐

the 7 in 372 465 is worth _____

b) Find the number that has a **6** in the thousands column.

	HTh	TTh	Th	H	T	O
A	6	9	2	4	8	1
B	2	5	6	9	0	3
C			4	6	1	5

the number with a 6 in the thousands column is _____

4 *Question 4 continued*

c) Complete the number sentence.

HTh	TTh	Th	H	T	O
7	0	5	9	3	2
700 000				30	2

the 9 is worth ☐

705 932 = 700 000 + _____ + _____ + 30 + 2

d) Write the number represented in numerals.

HTh	TTh	Th	H	T	O
○	○○ ○	○○ ○○		○○	○○ ○○ ○

the chart shows _____

e) Write **three hundred and four thousand and sixty** in numerals.

HTh	TTh	Th	H	T	O

three hundred and four thousand and sixty = _____

5 ★ In **530 817**, what is the value of the **first digit**, of the **third digit** and of the **digit 8**?

HTh	TTh	Th	H	T	O
5	3	0	8	1	7

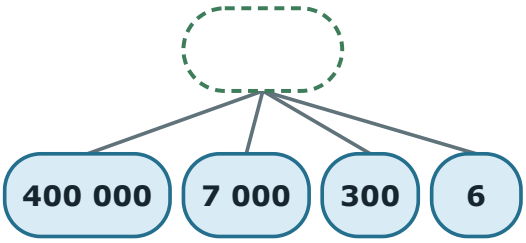
in 530 817 the 5 is worth _____

the third digit is worth _____

the 8 is worth _____

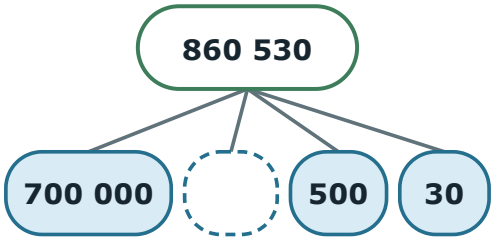
6 ★ Finish the model yourself, then write the equation.

a) Complete the number sentence: **? = 400 000 + 7 000 + 300 + 6**



400 000 + 7 000 + 300 + 6 = _____

b) Complete the part-whole model.



860 530 = 700 000 + _____ + 500 + 30

Numbers to 1 000 000

7 ★ The parts are not in order: **3 000 + 9 + 50 000 + 400 + 800 000**. Put every digit in its place, then **write the number.**

HTh	TTh	Th	H	T	O

3 000 + 9 + 50 000 + 400 + 800 000 = _____

8 ★ Partition **620 094** in a part-whole model: one part for every digit that is not 0. Start with the biggest part.

Draw your model

620 094 = _____ + _____ + _____ + _____

9 ★ Split **372 495** into its **thousands** and the **rest**, in a part-whole model.

Draw your model

372 495 = _____ + _____

APPLICATION **On the harbour steps** Use the model, then write your own number sentence.

10 ★★ On page 1 of the journal Max writes the travel fund for the year: **4 hundred-thousands, 8 ten-thousands, 5 thousands and 3 hundreds** of rand. **How much is the travel fund?**

HTh	TTh	Th	H	T	O

_____ = R _____

11 ★★ The sign says that the first three coats of paint on the bridge took **272 000 litres**. Tim imagines the paint in tanks of **1 000 litres** each. **How many tanks would that be?**

HTh	TTh	Th	H	T	O
2	7	2	0	0	0

272 000 litres = _____ tanks of 1 000 litres

12 ★★ Tim hides a 6-digit number behind his map and gives Max clues. Its greatest digit, **9**, has the largest possible value. The first and last digits add up to **12**. The second digit is **double** the last digit. The digit in the thousands place is worth **4 000** and the digit in the hundreds place is worth **800**. The last three digits add up to **16**. **What is Tim's number?**

HTh	TTh	Th	H	T	O

Tim's number is _____

13 ★★

a) Max has **9 counters** and a place-value chart with six columns. Every column must get at least one counter. **What is the greatest number Max can make?**

HTh	TTh	Th	H	T	O

the greatest number is _____

b) And what is the smallest number Max can make with the 9 counters?

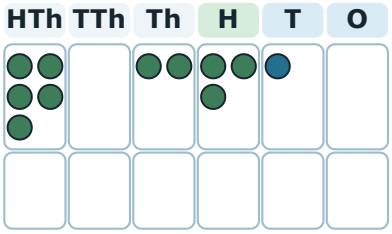
HTh	TTh	Th	H	T	O

the smallest number is _____

REASONING **Is every digit in its place?** Decide, then explain how you know.

14 ★★★

a) Tim lays counters on the chart. **What number has he made?**



the chart shows _____

b) Tim says: "The number is 52 310." **What mistake has Tim made?**

- ◯ He read one digit too many
- ◯ He did not write a 0 to hold the empty ten-thousands place
- ◯ There is no mistake: 52 310 is correct

Explain: _____

15 ★★★

a) Max is writing numbers in numerals in the journal. For **a quarter of a million** he writes **25 000**. **What mistake has Max made?**

- ◯ A quarter of a million is 2 500 000
- ◯ 25 000 is twenty-five thousand: he has left out a place
- ◯ There is no mistake

b) So write **a quarter of a million** in numerals.

HTh	TTh	Th	H	T	O

a quarter of a million = _____

Explain: _____

16 ★★★

a) Tim partitions **306 027** into the parts **3, 6, 2 and 7**. **Do you agree with Tim?**

- ◯ Yes: those are the digits of the number that are not 0
- ◯ No: the number has six digits, so it needs six parts
- ◯ No: he has not thought about the place value of each digit

16 *Question 16 continued*

b) Partition **306 027** in a part-whole model. Start with the biggest part.

Draw your model

306 027 = _____ + _____ + _____ + _____

Explain: _____

17 ★★★

a) Max says: "750 640 = 600 000 + 150 000 + 600 + 40." Tim says: "750 640 = 700 000 + 50 000 + 600 + 40." **Who is right?**

- ○ Only Max
- ○ Only Tim
- ○ Both of them

Explain: _____

b) So complete a third way.

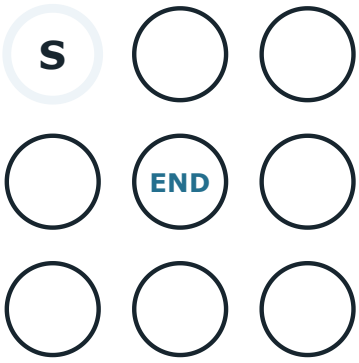
Draw your model

750 640 = 400 000 + _____ + 600 + 40

18 PROBLEM OF THE DAY **The lantern trail**

At dusk Tim spots nine lanterns hung in a 3 by 3 square above the harbour steps, under the great bridge. Max wants to light every lantern in one walk, and the middle one last, and Tim follows the walk on his map. Max steps only to a lantern right next to him (never diagonally) and never visits a lantern twice.

Start at S and finish on the lantern marked END. Number the lanterns in the order Max lights them.



Think further: Now there is no END. From which lanterns can Max NOT start a walk that lights all nine? Why?

Explain one thing you learned.

I can do this: ○ independently ○ with help ○ I need more practice