
**ESSENTIAL
EXERCISES**

YEAR 3

M A T H S

Authors

Jomary Roble B.Sc. Ed.

Warwick Marlin B.Sc. Dip.Ed.

CONTENTS

	Page
INTRODUCTION	
• Acknowledgements	iii
• Availability of books in this series	iv
• The New National Australian Curriculum	vi
• Some features and benefits of this book	vii
• Calculators and Computers	viii
NUMBER & ALGEBRA	
<input type="checkbox"/> NUMBER AND PLACE VALUE (PART 1)	2
<input type="checkbox"/> NUMBER AND PLACE VALUE (PART 2)	14
<input type="checkbox"/> FRACTIONS AND DECIMALS	28
<input type="checkbox"/> MONEY & FINANCIAL MATHEMATICS	40
<input type="checkbox"/> PATTERNS AND ALGEBRA	52
MEASUREMENT & GEOMETRY	
<input type="checkbox"/> USING UNITS OF MEASUREMENT	64
<input type="checkbox"/> SHAPE	78
<input type="checkbox"/> LOCATION AND TRANSFORMATION	90
<input type="checkbox"/> GEOMETRIC REASONING	102
STATISTICS & PROBABILITY	
<input type="checkbox"/> CHANCE	114
<input type="checkbox"/> DATA REPRESENTATION AND INTERPRETATION	116
APPENDIX	
<input type="checkbox"/> USEFUL CHARTS AND OTHER INFORMATION	129
SOLUTIONS TO GRADED EXERCISES	137

NOTE: The New Australian National Curriculum has been split into 3 major strands:

Ⓐ Number & Algebra

Ⓑ Measurement & Geometry

Ⓒ Statistics & Probability

In the Year 3 content descriptions, these 3 major strands have been further subdivided into the sub-strands shown above.

THE NEW NATIONAL AUSTRALIAN CURRICULUM

The authors acknowledge the dedicated work of the Australian Curriculum Assessment and Reporting Authority (ACARA), and the many who have contributed to the development of the Australian curriculum in response to the aims of the 2008 Melbourne declaration on Educational Goals for Young Australians.

This book provides a summary and interpretation of their guidelines for those interested in developing mathematical understanding in Year 3 students.

The Australian National Curriculum, developed by ACARA, states that, by the end of Year 3, students should be able to do the following:

- ☐ recall number facts for single digit numbers.
- ☐ be familiar with collections up to 10 000.
- ☐ describe number patterns involving addition and subtraction.
- ☐ recognise the connection between multiplication and division.
- ☐ model and represent unit fractions.
- ☐ count the change required and represent money values in various ways.
- ☐ compare objects using familiar units.
- ☐ compare angle sizes.
- ☐ identify symmetry.
- ☐ tell the time.
- ☐ interpret positions and pathways on maps.
- ☐ conduct chance experiments and describe the possible outcomes.
- ☐ create, interpret and compare data displays.

THE MATHEMATICS CURRICULUM OPERATES ON ANOTHER LEVEL, THE SO CALLED PROFICIENCY LEVEL.




The Proficiency strands at this level include:

1. **Understanding:** the connecting of number calculations with counting sequences, partitioning and counting numbers flexibly, identifying and describing the relationship between addition and subtraction and between multiplication and division.
2. **Fluency:** the counting of numbers in sequences readily, using units iteratively to compare measurements, listing possible outcomes of chance events, describing and comparing time durations.
3. **Problem solving:** this includes formulating problems from authentic situations, making models and using number sentences that represent problem situations, planning routes on maps, and matching transformations with their original shape.
4. **Reasoning:** using known facts to derive strategies for unfamiliar calculations, comparing and contrasting related models of operations, describing connections between 2-D and 3-D representations, and creating and interpreting simple representations of data.

Understanding, Fluency, Problem Solving and Reasoning are a central part of Mathematics content across the three major strands as mentioned earlier (Number and Algebra, Measurement and Geometry, and Statistics and Probability).

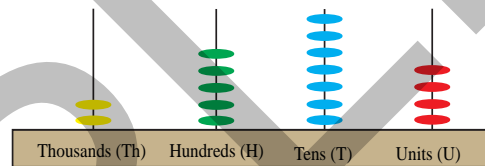
NUMBER AND PLACE VALUE (Part 1)

The “Australian Curriculum Mathematics” (ACM) references for this sub-strand of “Number and Algebra” (NA) are below:

-  Investigate the conditions required for a number to be odd or even and identify odd and even numbers (ACMNA 051).
-  Recognise, model, represent and order numbers to at least 10 000 (ACMNA 052).
-  Apply place value to partition, rearrange and regroup numbers to at least 10 000 to assist calculations and solve problems (ACMNA 053).

THE ABACUS

Originating from China, this is a device for counting numbers. In schools we use a simplified version, like the picture below, to show place value. Each spike represents a different place value, and we place counters on the spikes to show different numbers. The abacus on the right shows the number 2 574.



BASE TEN WOODEN BLOCKS

These are used in schools to represent ones (units), tens and hundreds and thousands. These blocks are available at most educational stores.

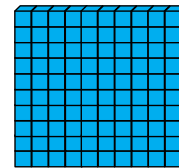
A single cube represents one unit and is referred to as a **SHORT**.



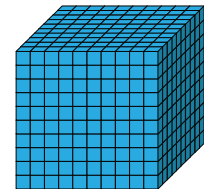
A row of ten cubes joined together represents ten and is called a **LONG**.



A raft of ten longs joined together represents one hundred (10 longs or 100 shorts) and is referred to as a **FLAT**.



A large cube made from 10 flats joined together represents one thousand (10 flats or 100 longs or 1000 shorts) and is called a **BLOCK**.



NUMBER OR NUMERAL EXPANDERS

A number or numeral expander is a simple learning aid made out of paper, or light cardboard strips, which can show place value, and also how to name a number.

7	Thousands	3	Hundreds	8	Tens	2	Ones
---	-----------	---	----------	---	------	---	------

The expander above clearly shows the numeral 7 382.

EVEN NUMBERS AND ODD NUMBERS

2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, etc.

Even numbers always end in 2, 4, 6, 8, or 0.

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, etc.

Odd numbers always end in 1, 3, 5, 7, or 9.

Houses are usually numbered even on one side of the street, and numbered odd on the other side of the street.



◆ PLACE VALUE

The value of a digit depends on its position or place in the numeral.

In 8 174 the 7 has the value of 7 tens = 70.

In 8 147 the 7 has the value of 7 ones = 7.

In 7 814 the 7 has the value of 7 thousands = 7 000.

In 4 718 the 7 has the value of 7 hundreds = 700.

It is extremely important to understand that our number system is based on PLACE VALUE!!



◆ SERIES

Discover the pattern and find the missing numbers.

120, 122, 124, 126, ?, ?

97, 95, 93, 91, ?, ?

37, 42, 47, 52, ?, ?

70, 63, 56, 49, ?, ?

◆ EXPANDED NOTATION

This means to rewrite the number as an addition sentence using thousands, hundreds, tens, and units.

7 326 = $(7 \times 1\,000) + (3 \times 100) + (2 \times 10) + (6 \times 1)$

5 902 = $(5 \times 1\,000) + (9 \times 100) + (0 \times 10) + (2 \times 1)$

◆ ROUNDING OFF

In some situations in Maths, particularly when using a calculator, we do not require the exact answer, but an approximate answer only. The question will then ask you to ROUND OFF the given number to the nearest ten, nearest hundred or nearest thousand.

Example:

If we round off 73 to the nearest ten, then the answer is 70, because 73 is closer to 70 than it is to 80.

If we round off 659 to the nearest hundred, then the answer is 700, because 659 is closer to 700 than it is to 600.

Numbers ending in 5 or 50 are always rounded up!!



◆ ESTIMATING

When using a calculator, you will be surprised how easy it is to press the wrong button and then get a ridiculous answer which is way out from the correct answer. If we quickly and mentally estimate an approximate answer to begin with, then this will prevent us from making careless blunders.

Estimate the answer to $469 + 1\,728$

Therefore estimate = $500 + 1\,700$
= 2 200

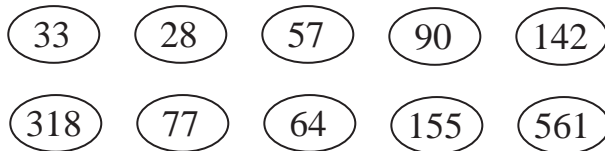
469 rounds up to 500.
1 728 rounds down to 1 700.



For further reference, see 'Understanding Year 3 Maths' by W. Marlin



1. Shade the even numbers and cross out the odd numbers.



Remember!
Numbers that can be divided by 2 are **even numbers** and numbers than can't be divided by 2 are **odd numbers**.



2. Write the following as ordinary numerals.

a) Five hundred and seventy nine =

b) Two thousand, four hundred and thirty eight =

3. Order the numbers from smallest to largest.

a) 1 035, 627, 2 448, 962, 456



b) 3 258, 1 792, 599, 2 871, 836



4. Write the largest possible numbers using the digits given.

a) 2, 3, 1

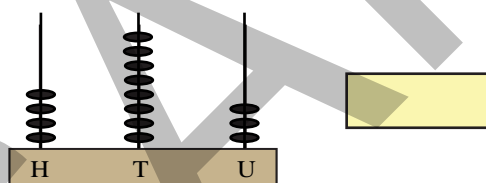


b) 3, 4, 9

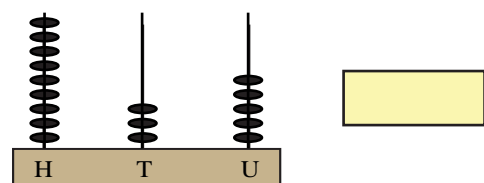


5. Count the beads on each abacus and write the number in numerals and in words.

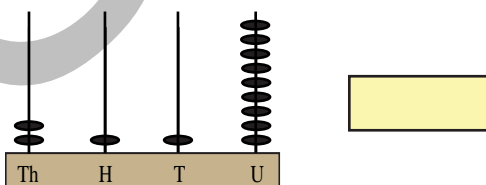
a)



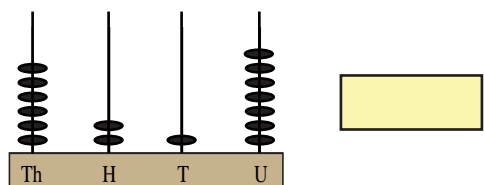
b)



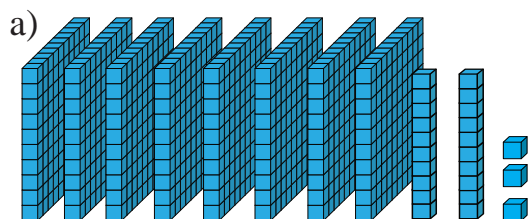
c)



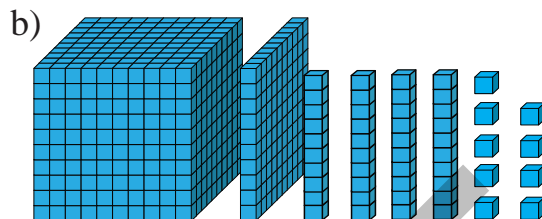
d)



6. Write the number shown by the Base Ten blocks, and fill in the numeral expanders.



Thousands	Hundreds	Tens	Ones



Thousands	Hundreds	Tens	Ones

7. How many digits are there in each number? Write your answer on the line.

a) 13 ➡ _____ b) 126 ➡ _____ c) 649 ➡ _____ d) 1 587 ➡ _____

8. Write the place value of the underlined digits.

a) 87 ➡

b) 3 69 ➡

c) 856 ➡

d) 1 246 ➡

e) 2 943 ➡

f) 4 513 ➡

9. Write the following in numerals.

a) $(7 \times 10) + (8 \times 1) =$

b) $(2 \times 100) + (7 \times 10) + (5 \times 1) =$

c) $(1 \times 1\,000) + (3 \times 100) + (5 \times 10) + (4 \times 1) =$

d) $(3 \times 1\,000) + (6 \times 100) + (2 \times 10) + (8 \times 1) =$

10. Write the numerals below in expanded notation.

a) 84 =

b) 432 =

c) 1 246 =

d) 2 461 =

11. Is 36 closer to 30 or 40? 36 is closer to 40, therefore it is rounded up to 40.

Try this!

Round off the following numbers to the nearest 10.

a) 48 ➡ _____ b) 53 ➡ _____ c) 74 ➡ _____

d) 85 ➡ _____ e) 121 ➡ _____ f) 639 ➡ _____

Remember!
The middle number is
always rounded up.



12. First, round off the numbers to the nearest 10, and then estimate the answers.

a) 34 + 17

	+	
--	---	--

Round off

--

Estimate

b) 46 + 62

	+	
--	---	--

Round off

--

Estimate

c) 128 + 91

	+	
--	---	--

Round off

--

Estimate



1. Fill in the boxes with the next even numbers.

a) 12,

b) 50,

c) 234,

d) 890,

e) 1 256,

f) 3 578,

2. Fill in the boxes with the next odd numbers.

a) 21,

b) 99,

c) 561,

d) 745,

e) 2 707,

f) 4 873,

3. Use $>$ OR $<$ to compare the numbers.

a) 48 39

b) 81 97

c) 372 427

d) 785 628

$20 > 15$
Twenty is greater than fifteen.
 $38 < 52$
Thirty-eight is less than fifty two.



4. Write the smallest possible numbers using the given digits.

a) 5, 1, 3 \Rightarrow _____

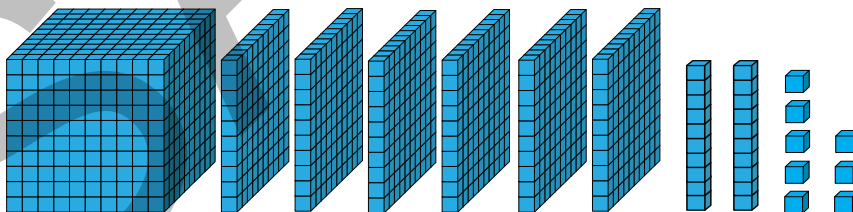
b) 4, 2, 6 \Rightarrow _____

5. Order the numbers from largest to smallest.

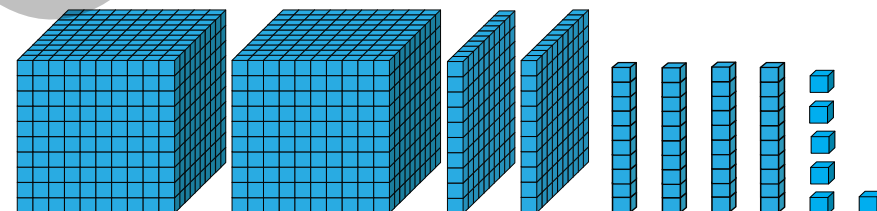
a) 3 847, 2 916, 5 467, 1 929, 6 310 b) 2 850, 5 619, 8 374, 4 956, 3 798

6. Write the numbers shown by the Base Ten blocks in numerals and in words.

a)

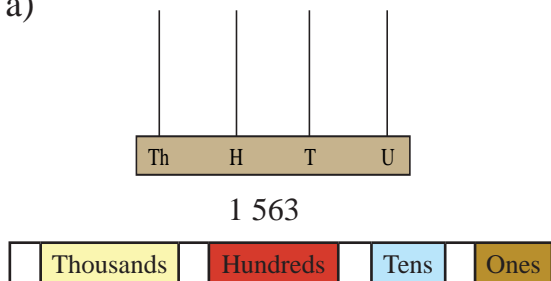


b)

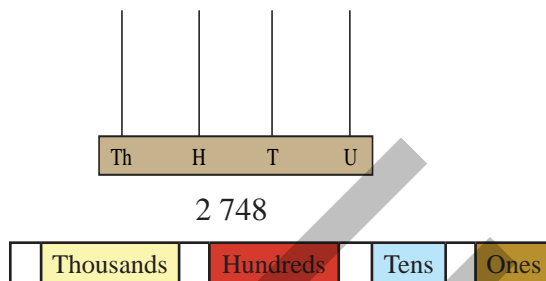


7. Draw the beads on the abacus using the number shown below each abacus, and fill in the numeral expanders.

a)



b)



8. Write the value of the underlined digits.

a) 720 ➡

b) 1 384 ➡

c) 5 566 ➡

d) 2423 ➡

e) 9 475 ➡

f) 7482 ➡

9. Write the numbers below as numerals.

a) $(9 \times 100) + (7 \times 10) + (3 \times 1) =$

b) $(2 \times 1\,000) + (8 \times 100) + (5 \times 10) + (4 \times 1) =$

c) $(4 \times 1\,000) + (2 \times 100) + (1 \times 10) + (8 \times 1) =$

d) $(6 \times 1\,000) + (1 \times 100) + (7 \times 10) + (5 \times 1) =$

10. Write the numbers below in expanded notation.

a) 1 234 =

b) 3 596 =

c) 4 118 =

d) 7 862 =

11. Is 135 closer to 100 or 200? 135 is closer to 100, therefore it is rounded down to 100.

Try these!

Round off the following numbers to the nearest 100.

a) 160 ➡

b) 214 ➡

c) 475 ➡

d) 682 ➡

e) 350 ➡

f) 1 928 ➡

Remember!
The middle
number is always
rounded up.



12. First, round off the numbers to the nearest 100, and then estimate the answers.

a) 224 + 369

b) 473 + 192

+ Round Off

+ Round Off

Estimate

Estimate



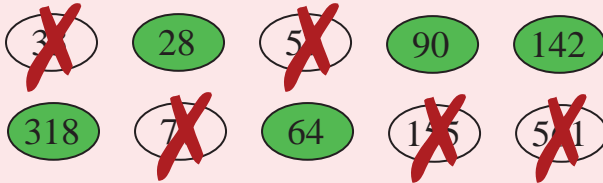
These are the **answers!**

**Level
1**

NUMBER AND PLACE VALUE (Part 1)

Easier

1. Shade the even numbers and cross out the odd numbers.



Remember!
Numbers that can be divided by 2 are **even numbers** and numbers that can't be divided by 2 are **odd numbers**.



2. Write the following as ordinary numerals.

a) Five hundred and seventy nine = 579

b) Two thousand, four hundred and thirty eight = 2 438

3. Order the numbers from smallest to largest.

a) 1 035, 627, 2 448, 962, 456 \Rightarrow 456, 627, 962, 1 035, 2 448

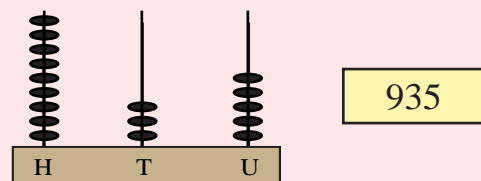
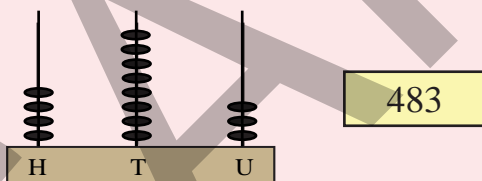
b) 3 258, 1 792, 599, 2 871, 836 \Rightarrow 599, 836, 1 792, 2 871, 3 258

4. Write the largest possible numbers using the digits given.

a) 2, 3, 1 \Rightarrow 321 b) 3, 4, 9 \Rightarrow 943

5. Count the beads on each abacus and write the number in numerals and in words.

a) b)



c) d)

