ESSENTIAL EXERCISES

YEAR 2

MATHS

SAMPLE

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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

❑ NUMBER AND PLACE VALUE (PART 1) 2

❑ NUMBER AND PLACE VALUE (PART 2) 14

❑ FRACTIONS AND DECIMALS 26

❑ MONEY & FINANCIAL MATHEMATICS 38

❑ PATTERNS AND ALGEBRA 50

MEASUREMENT & GEOMETRY

❑ USING UNITS OF MEASUREMENT (PART 1) 62

❑ USING UNITS OF MEASUREMENT (PART 2) 76

❑ SHAPE 88

❑ LOCATION AND TRANSFORMATION 100

STATISTICS & PROBABILITY

❑ CHANCE 112

❑ DATA REPRESENTATION AND INTERPRETATION 113

SOLUTIONS TO GRADED EXERCISES 125

SAMPLE

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

Ⓐ Number & Algebra Ⓑ Measurement & Geometry Ⓒ Statistics & Probability

In the Year 2 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 2 students.

The Australian National Curriculum, developed by ACARA, states that, by the end of Year 2, students should be able to do the following:

- Recognise increasing and decreasing number sequences involving 2's, 3's and 5's.
- Represent multiplication and division by grouping into sets.
- Associate collections of Australian coins with their value.
- Identify the missing element in a number sequence.
- Recognise the features of three-dimensional objects.
- Interpret simple maps of familiar locations.
- Explain the effects of one-step transformations.
- Make sense of collected information.
- Count to and from 1 000.
- Perform simple addition and subtraction calculations using a range of strategies.
- Divide collections of objects into halves, quarters and eighths.
- Order shapes and objects using informal units.
- Tell the time to the quarter hour.
- Use a calendar to identify the date and the months included in the seasons.
- Draw two-dimensional shapes.
- Describe outcomes for everyday events.
- Collect data from relevant questions to create lists, tables and picture graphs.

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).

SAMPLE

NUMBER AND PLACE VALUE (Part 1)

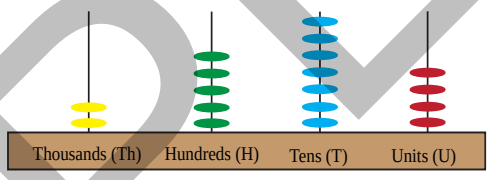
The "Australian Curriculum Mathematics" (ACM) references for this sub-strand of "Number and Algebra" (NA) are below:

- *Investigate number sequences, initially those increasing and decreasing by two's, three's, five's and ten's from any starting point, then moving to other sequences (ACMNA 026).*
- *Recognise, model, represent and order numbers to at least 1000 (ACMNA 027).*
- *Group, partition and rearrange collections upto 1000 in hundreds, tens and ones to facilitate more efficient counting (ACMNA 028).*

Note: *Very similar to the Year 1 contents, except that the numbers in the questions are now getting much larger up to 1000.*

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.



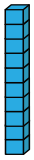
BASE TEN WOODEN BLOCKS

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

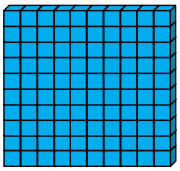
A single cube represents one unit and is referred to as a **SHORT**



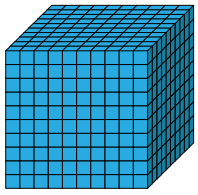
A row of ten cubes joined together represents ten and is called a **LONG**



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**.



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.

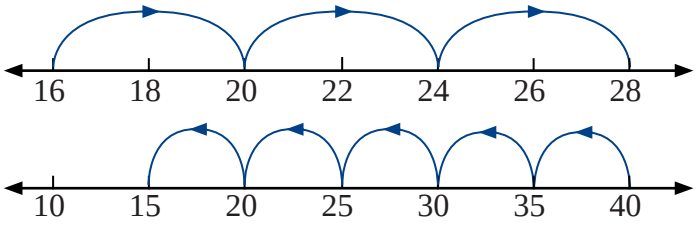


Houses are usually numbered even on one side of the street, and numbered odd on the other side of the street.

SAMPLE

SKIP COUNTING

Number lines can be used for skip counting both forwards and backwards.



Skip counting forwards by 4's starting at 16.

Skip counting backwards by 5's starting at 40.

PLACE VALUE

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

In 8 1<u>7</u>4 the 7 has the value of 7 tens = 70.
In 8 14<u>7</u> the 7 has the value of 7 ones = 7.
In <u>7</u> 814 the 7 has the value of 7 thousands = 7 000.
In 4 <u>7</u>18 the 7 has the value of 7 hundreds = 700.

Remember to try and keep a small space between the thousands column and the hundreds column.



SERIES

Discover the pattern and find the missing numbers.

120, 122, 124, 126, ? , ?

37, 42, 47, 52, ? , ?

97, 95, 93, 91, ? , ?

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

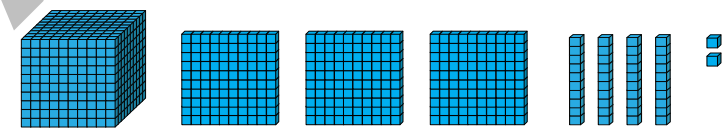
RECORDING NUMBERS

Numbers can be recorded in many different ways.
Figures: 1 342
Words: One thousand, three hundred and forty two.

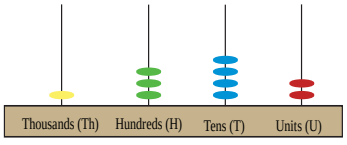
Base Ten blocks and the abacus are excellent aids for understanding PLACE VALUE!



Base Ten Blocks:



Abacus:



Expanded Notation: $(1 \times 1\,000) + (3 \times 100) + (4 \times 10) + (2 \times 1)$

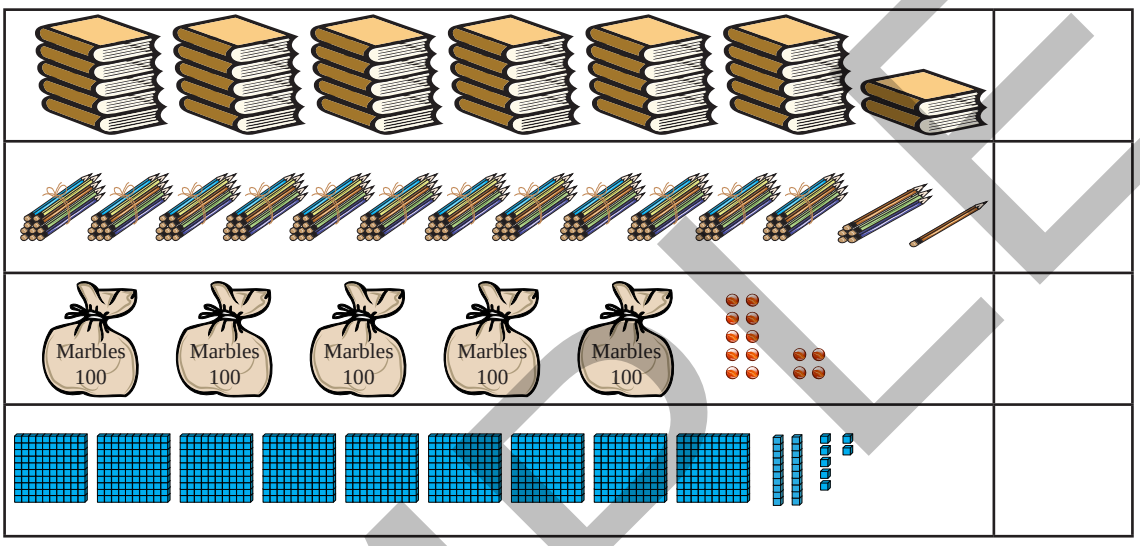
For further reference, see 'Understanding Year 2 Maths' by A. Horsfield

SAMPLE

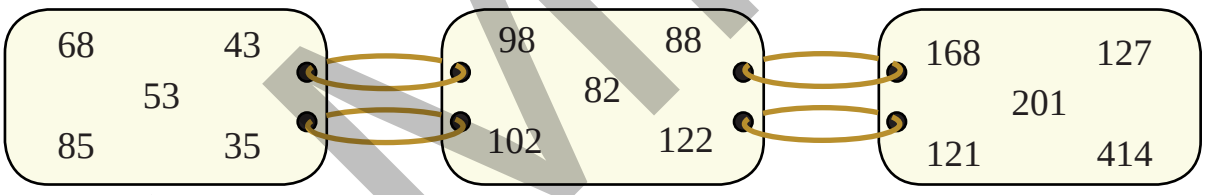


1. Count the number of objects and write the numbers in the given boxes.

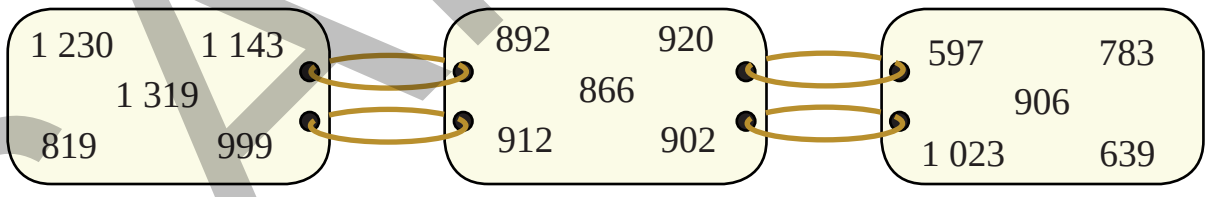
a) b) c) d)



2. Circle the smallest number in each group.



3. Circle the greatest number in each group.



4. Arrange the numbers in correct order.

a) Increasing order: 49 69 39 59 79 _____

b) Decreasing order: 96 91 101 81 86 _____

5. Write each number in words.

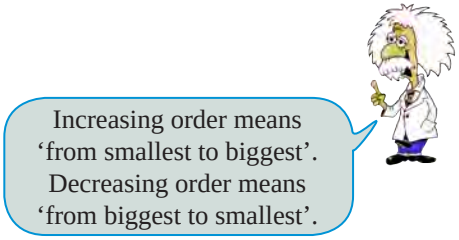
a) 42 =

b) 110 =

c) 359 =

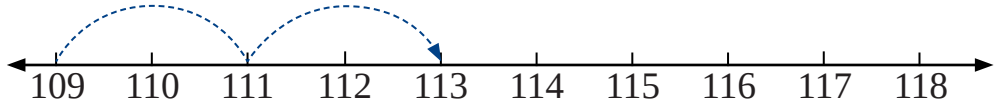
d) 624 =

e) 807 =



SAMPLE

6. Trace the broken lines and find the rule. Circle the next two numbers.



7. Fill in the missing numbers.

a) 72, 74, ____, 78, ____, 82

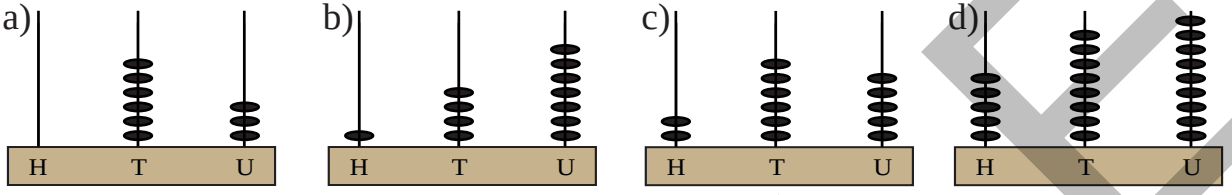
b) 103, 106, ____, 112, ____, 118

c) 210, 205, ____, ____, 190, ____,

d) 380, 390, ____, 410, ____, ____

8. Count the beads on each abacus and write the numeral on the lines.

a) b) c) d)



Write the answers above in the place value table below.

	Hundreds	Tens	Ones
a)			
b)			
c)			
d)			

9. Write the place value of 2 in each number.

a) 52 ➡ b) 294 ➡

c) 321 ➡ d) 420 ➡

e) 562 ➡ f) 792 ➡

g) 823 ➡ h) 1 251 ➡

10. Write each number in expanded form.

a) 87 = b) 263 =

c) 495 = d) 628 =

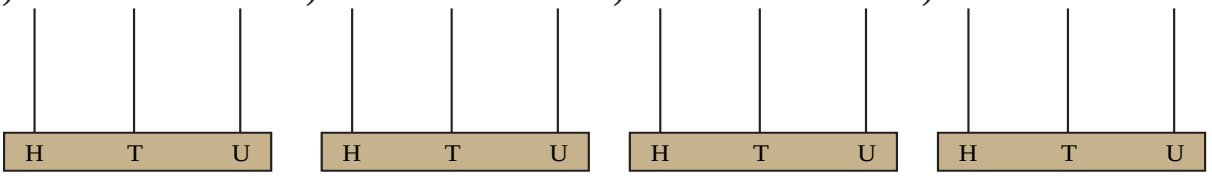
11. Write each number in standard form (short way).

a) (3 x 10) + 9 = b) (1 x 100) + (8 x 10) + 4 =

c) (5 x 100) + (6 x 10) + 7 = d) (9 x 100) + (1 x 10) + 8 =

12. Draw the beads on the abacus using the number shown below each abacus.

a) b) c) d)



53 122 288 476

SAMPLE

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1. Circle the smallest number and put a cross (✗) on the greatest number. Then arrange each set of numbers in increasing order. Write your answers on the lines.

a)

200		250
	225	
175		210

_____

b)

450		600
	350	
650		500

_____

c)

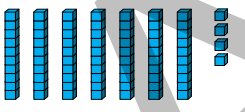
800		600
	1 000	
700		900

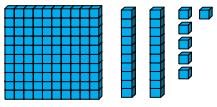
_____

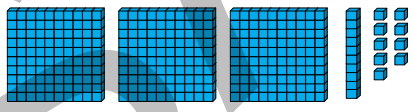
2. Write each number sentence as a numeral.
   a) One hundred and eighty two =
   b) Four hundred and seventy five =
   c) Nine hundred and sixty five =
   d) One thousand, two hundred and thirty four =

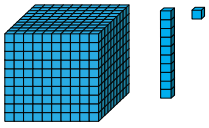
3. How many even numbers between 62 and 90 including 62 and 90? ☐
   Write them down. _____

4. What numbers are shown by the following Base Ten blocks? Write your answers on the lines.

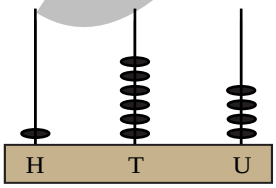
a)  = _____

b)  = _____

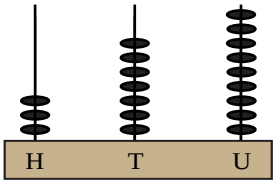
c)  = _____

d)  = _____

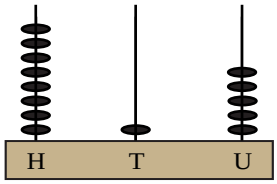
5. Count the beads on each abacus and write the numeral below.

a) 

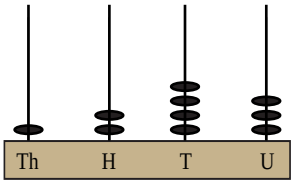
_____

b) 

_____

c) 

_____

d) 

_____

SAMPLE

6. Write the place value of 3 in each number.

a) 23 ➡ b) 138 ➡

c) 374 ➡ d) 793 ➡

7. Discover and complete the number pattern. Write your answers in the boxes.

a) 98, 100, ☐, 104,106, ☐ b) 410, 405, ☐, ☐, 390, 385

c) 580, 570, ☐, 550, ☐, 530 d) 733, 736, ☐, ☐, 745, ☐

8. Write each number in standard form (short way).

a) $(9 \times 10) + 2 =$ b) $(1 \times 100) + (5 \times 10) + 3 =$

c) $(4 \times 100) + (2 \times 10) + 7 =$ d) $(8 \times 100) + (3 \times 10) + 6 =$

9. Write the place value of 8 in each number.

a) 85 ➡ b) 138 ➡

c) 487 ➡ d) 826 ➡

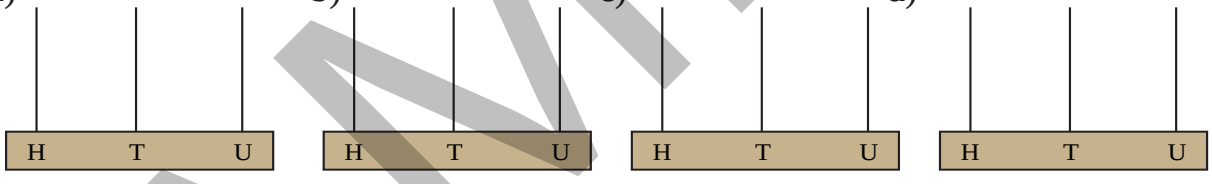
10. Write each number in expanded form.

a) 48 = b) 219 =

c) 573 = d) 910 =

11. Draw the beads on the abacus using the number shown below each abacus.

a) b) c) d)



226 381 524 649

12. Using the answers in question 11, write each number in expanded form.

a) b)

c) d)

13. Write the place value of the underlined digits below.

a) 1<u>7</u>3 ➡ b) <u>2</u>46 ➡

c) 59<u>5</u> ➡ d) 9<u>1</u>8 ➡

14. Fill in the missing numbers.

a) 273, 263, , 243, , 223 b) 317, 322, , 332, , 

SAMPLE

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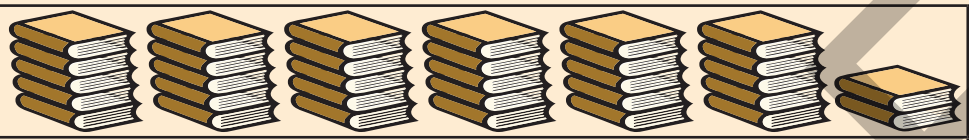
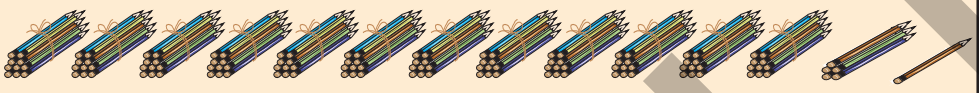
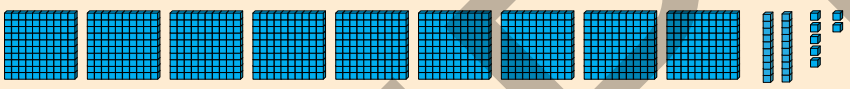
These are the **answers!**

Level 1

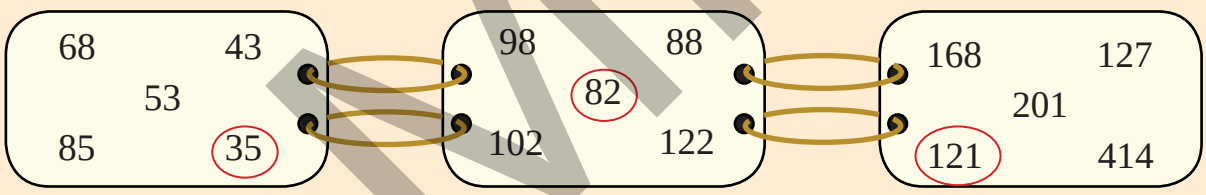
NUMBER AND PLACE VALUE (Part 1)

Easier

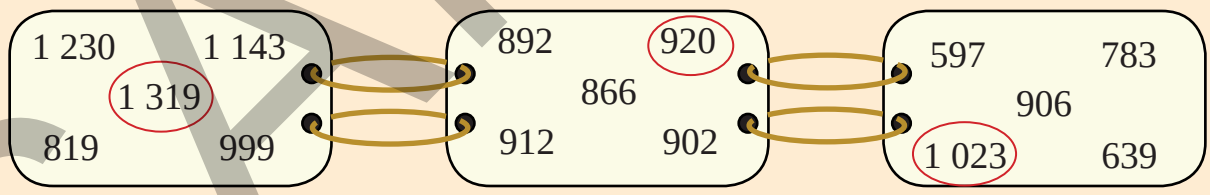
1. Count the number of objects and write the numbers in the given boxes.

a)		32
b)		126
c)		514
d)		927

2. Circle the smallest number in each group.



3. Circle the greatest number in each group.



4. Arrange the numbers in correct order.

a) Increasing order: 49 69 39 59 79 — 39, 49, 59, 69, 79

b) Decreasing order: 96 91 101 81 86 — 101, 96, 91, 86, 81

5. Write each number in words.
   a) 42 = forty two
   b) 110 = one hundred and ten
   c) 359 = three hundred and fifty nine
   d) 624 = six hundred and twenty four
   e) 807 = eight hundred and seven



Increasing order means 'from smallest to biggest'. Decreasing order means 'from biggest to smallest'.

SAMPLE