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**UNDERSTANDING**  
**YEAR 4**  
**M A T H S**

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**Author**

*Merle Green B.Ed. T.C. (University of London)*

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

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

In the Year 4 content descriptions, these 3 major strands have been further subdivided into the topic areas shown above.

## ABOUT YEAR 4 MATHS

This book provides a structured and clear interpretation of the Australian mathematics curriculum, detailing what a child is required to know by the end of Year 4. It covers the syllabus topic by topic, explaining what is to be taught and how it is being taught in Australian classrooms. It is a comprehensive, well-presented and easy to understand book which provides an ideal reference for parents to consult when they wish to provide assistance in supporting the development of their child's mathematical understanding.

The Australian mathematics curriculum caters for the acquisition of basic concept skills and processes. It contains three content strands, each divided into a number of sub-strands or topics, which set out what needs to be learnt. 'The Number and Algebra' and 'Measurement and Geometry' strands each have 4 sub-strands, and the 'Statistics and Probability' strand has been divided into 2 substrands. Entwined with these are the four proficiency strands of Understanding, Fluency, Problem Solving and Reasoning, which determine how the content is studied and developed so that mathematical learning and understanding continue to progress over the years. It is most important for a child to be aware that each sub-strand is not an isolated topic but is interrelated with the others, and also with other subjects, for example, Science and Geography. Technology such as computers, touch pad applications and calculators should be utilised as an aid, when appropriate.

In Year 4, the emphasis is on mathematical experiences that are meaningful in real life. These experiences should build on learning acquired from Kindergarten through Year 3. Students should be encouraged to select appropriate procedures in problem solving, to justify and give reasons for their choice, and to assess the reasonableness of their answers.

Each day of our lives, we use many mathematical concepts and processes, usually without our realising that we are doing it. We constantly have to solve problems which require mathematical thinking whether spatial, involving manipulating numbers, or needing an understanding of measurement in one form or another. The over-riding aim of the Australian curriculum is to develop confident students who are able to use their knowledge and understanding of mathematics effectively and efficiently in their everyday lives, regardless of where they live.

This book supports that aim.

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## THE NEW NATIONAL AUSTRALIAN CURRICULUM

Merle Green acknowledges the dedicated work of the Australian Curriculum Assessment and Reporting Authority (ACARA) and the many others 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 4 students.**

The Australian National Curriculum, developed by ACARA, states that, by the end of Year 4, students should be able to do the following:

- recall multiplication facts up to  $10 \times 10$  and the related division facts.
- be familiar with collections up to 100 000.
- recognise and locate familiar fractions on a number line and make connections between fraction and decimal notations.
- solve problems by using relevant number sentences involving the four operations.
- convert between units of time and solve problems involving time duration.
- compare areas of regular and irregular shapes.
- classify angles.
- create symmetrical patterns.
- interpret the information contained in maps.
- describe the probabilities of everyday events.
- investigate different methods for data collection, construct data displays and evaluate their effectiveness.



You  
will see me on many  
of the pages... I will be trying to  
give you some reminders and  
advice.

## NUMBER & PLACE VALUE ( Part 1 )

**Note:** This is a very large substrand, so the author feels that it should be split up into 3 different parts.

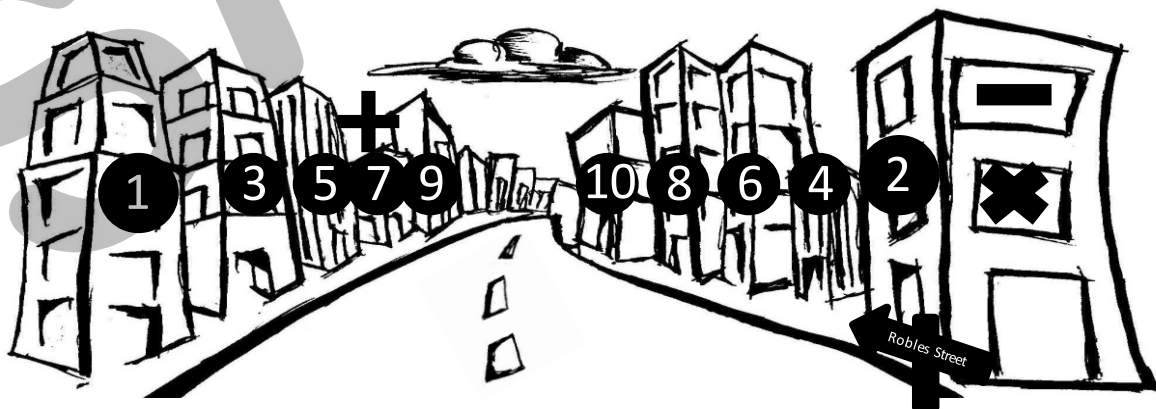
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**Note:** The “Australian Curriculum Mathematics” (ACM) references for this sub-strand of “Number and Algebra” (NA) have been given below. This sub-chapter endeavours to explain the mathematical concepts outlined in these curriculum references.

Investigate and use the properties of odd and even numbers (ACMNA071)

Recognise, represent and order numbers to at least tens of thousands (ACMNA072)

Apply place value to partition, rearrange and regroup numbers to at least tens of thousands to assist calculations and solve problems (ACMNA073)



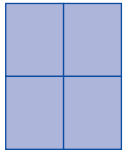
“Houses usually have odd numbers on one side of the street, and even numbers on the other side.”

## EVEN NUMBERS

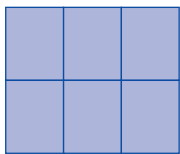
The ability to identify even and odd numbers is an important skill that children will need to make calculations easier in many areas of their maths education.



Group 2 tiles together



Group 4 tiles together.

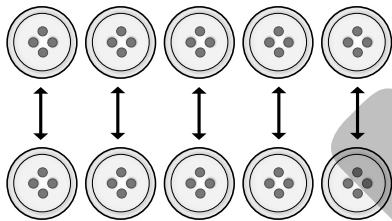


Group 6 tiles together.



Pairs or groups of 2 can be made. Nothing is left over.

In each case, groups of two or pairs can be made. All collections of objects which can be arranged in twos are even. 2, 4 and 6 are even numbers.



These 10 buttons can be arranged in twos. 10 is an even number.

An **Even** number can be grouped in 2s,  
or made into pairs

When we say, '2, 4, 6, 8, 10, 12, 14, 16,' we are counting in **even** numbers.

**Even** numbers can be divided evenly into two equal groups. 12 is an even number because it can be divided in 2 equal groups with 6 in each group.

Any number that can be divided by 2 is an **even** number. 20 is an even number because it can be divided into 2 equal groups of 10.

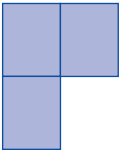
An **even** number has **0, 2, 4, 6, or 8** in the units place: **58, 74, 110, 978**.

### ACTIVITIES:

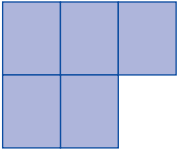
Go on a number search. Numbers are everywhere - on the clock, TV remote, road signs, in books, timetables for TV programs, on a telephone.

Where else can you find them? Can you work out which are even numbers? Who do you know who lives in a house with an even number?

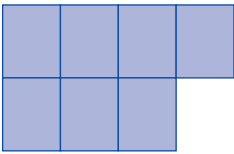
## ODD NUMBERS



Group 3 tiles together



Group 5 tiles together.

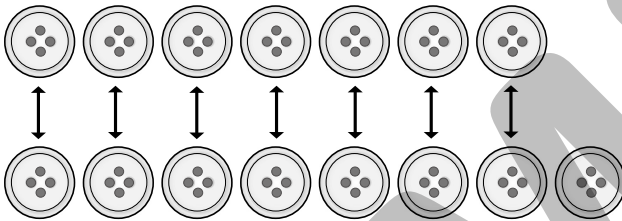


Group 7 tiles together.



There is always  
an extra one left over.

In each of these cases, twos or pairs cannot be made because there is always one tile left over. All collections of objects which cannot be arranged in twos are **odd**. 3, 5, 7 are **odd** numbers.



These 15 buttons cannot be arranged in twos  
because there is one button left over.

15 is an **odd number**.

An **Odd** number cannot be made into  
pairs; there will always be one left over.

When we count, '1, 3, 5, 7, 9, 11, 13, 15, 17,' we are counting **odd** numbers.

**Odd** numbers cannot be divided into twos. 13 is an **odd** number because when we try to divide it into pairs we can make six pairs with one left over.

Any number, that when divided into 2 groups, has one left over is an **odd** number. 21 is an **odd** number because when divided into 2 groups there is one left over.

An **odd** number has **1, 3, 5, 7, or 9** in the units place: **27, 45, 81, 123**.

### ACTIVITIES:

Go on an odd number search. Remember, numbers are everywhere.

Who do you know whose age is an odd number?

Who do you know who has an odd number of people living in their house?

## ADDING, SUBTRACTING AND MULTIPLYING ODD AND EVEN NUMBERS

### Adding Even And Odd Numbers

$$\text{even} + \text{even} = \text{even}$$
$$4 + 2 = 6$$

$$\text{even} + \text{odd} = \text{odd}$$
$$4 + 3 = 7$$

$$\text{odd} + \text{odd} = \text{even}$$
$$5 + 3 = 8$$

$$\text{even} + \text{even} + \text{even} = \text{even}$$
$$2 + 4 + 6 = 12$$

$$\text{odd} + \text{odd} + \text{odd} = \text{odd}$$
$$1 + 3 + 5 = 9$$

$$\text{even} + \text{even} + \text{odd} = \text{odd}$$
$$2 + 4 + 1 = 7$$

$$\text{even} + \text{odd} + \text{odd} = \text{even}$$
$$8 + 3 + 5 = 16$$

Knowing the rules for adding, subtracting and multiplying odd and even numbers helps you to check the correctness of an answer.

### Subtracting Even And Odd Numbers

$$\text{even} - \text{even} = \text{even}$$
$$4 - 2 = 2$$

$$\text{even} - \text{odd} = \text{odd}$$
$$4 - 3 = 1$$

$$\text{odd} - \text{odd} = \text{even}$$
$$5 - 3 = 2$$

### Multiplying Even And Odd Numbers

$$\text{even} \times \text{even} = \text{even}$$
$$4 \times 2 = 8$$

$$\text{even} \times \text{odd} = \text{even}$$
$$4 \times 3 = 12$$

$$\text{odd} \times \text{odd} = \text{odd}$$
$$5 \times 3 = 15$$

It looks like a lot of rules to remember...but most of them are common sense.





**LEVEL 5 — NUMBER AND PLACE VALUE**  
(Part 1)

**EXTENSION QUESTIONS**

- Q1.** How could I be sure to get an even number answer when I add two numbers together?
- a) Add two even numbers.                      b) Add an odd and an even number.  
c) Add two odd numbers.                      d) Both a and c.                      e) a, b and c.

- Q2.** Write these words as numbers
- a) five thousands + thirteen tens + six  
b) six thousands + two tens + nine units **ADD ON** seven hundreds + four units

- Q3.** a) What is the smallest odd number using the numerals 4, 9, 8, 2, 5?  
b) What is the largest even number using the numerals 0, 6, 7, 1, 8?

- Q4.** Here are the heights of 5 mountains. Round them to the nearest 100m and 1 000m.

Mountain		Height (m)	Nearest 100m	Nearest 1000m
Mt. Everest	Nepal	8 848		
Mt Fuji	Japan	3 776		
Mt Cook	New Zealand	3 764		
Mt Kosciusko	Australia	2 228		
Uluru	Australia	867		

- a) Which is the highest mountain?  
b) About how many thousands of metres higher is the highest mountain than the lowest?  
c) Two mountains are almost the same height. What is the difference in their heights?  
d) About how many **TIMES** higher is Mt Everest than Uluru? (Think of place values.)  
e) Which would be higher, Mt Everest or Mt Fuji + Mt Cook + Uluru?  
f) How many metres higher?
- Q5.** Write the one number in which:
- a) 3 has a place value of three tens    b) 2 has a place value of two thousands  
c) 6 has a place value of six units    d) 5 has a place value of five hundreds  
e) 8 has a place value of eight tens of thousands
- Q6.** Add 500 and then round these numbers to the nearest 1 000.
- a) 7683                      b) 2831                      c) 5499
- Q7.** Captain Cook came to Australia about  $2\frac{1}{2}$  centuries ago. How many years ago is that?
- a) about 2 500 years                      b) about 25 years  
c) about  $2\frac{1}{2}$  years                      d) about 250 years

## LEVEL 1 – Odd and even numbers

- Q1. a) odd                      b) odd + even = odd      Answer = 27
- Q2. a) false                    b) true                      c) true
- Q3. a) 1 272                    b) 10 804                    c) 9 099
- Q4. a) seven hundred and six                      b) two thousand, eight hundred and twenty-five  
c) thirteen thousand, six hundred and eighty-four      d) One thousand and eighty six.
- Q5. a) 

9	H	6	T	0	U
---	---	---	---	---	---

      b) 

3	Th	7	H	4	T	3	U
---	----	---	---	---	---	---	---

      c) 

1	Tth	5	Th	2	H	9	T	1	U
---	-----	---	----	---	---	---	---	---	---
- Q6. a) 5 602                      b) 12 794
- Q7. a) true                      b) false, divide by 10                      c) true
- Q8. a) 700                      b) 9 000
- Q9. 100 hundreds
- Q10. a) 9 boxes                      b) 34 boxes                      c) 55 boxes
- Q11. a) 5 tens                      b) 5 ones or units                      c) 5 hundreds                      d) 5 thousands
- Q12. a) 100                      b) 100                      c) 400                      d) 200

## LEVEL 2 – Odd and even numbers

- Q1. a) odd                      b) even – odd = odd      Answer = 9
- Q2. a) 925                      b) 1 393                      c) 19 731
- Q3. a) 9 831                      b) 9 607                      c) 98 421
- Q4. b)
- Q5. c)
- Q6. 1 000 tens
- Q7. a) 400                      b) 500                      c) 900                      d) 700
- Q8. a) E                      b) C                      c) D                      d) B                      e) A                      f) F
- Q9. a) 3 643                      b) 2 943

## LEVEL 3 – Odd and even numbers

- Q1. a) even                      b) even
- Q2. a) 2 530                      b) 6 902                      c) 13 065
- Q3. a)  $4\,000 + 200 + 20 + 7$                       b)  $10\,000 + 1\,000 + 800 + 30$                       c)  $9\,000 + 10$
- Q4. a) XVI                      b) XXIX                      c) XXXII
- Q5. a) 45                      b) 64                      c) 93
- Q6. a) 3 hundreds                      b) 3 thousands                      c) 3 units or ones
- Q7. a) 5309                      b) 12 480                      c) 15 926                      d) 28 481
- Q8. a) 715, 751, 517, 571, 157, 175  
b) 157, 175, 517, 571, 715, 751
- Q9. 10 000 units or ones
- Q10. a) 12 boxes                      b) 36 boxes                      c) 104 boxes
- Q11. a) 4 000                      b) 18 000                      c) 9 000
- Q12. a) 5 403                      b) 9 276                      c) 17 927