

★ TO THE STUDENT ★

Book 6, CSF Level 4

	Page
Lesson 1 – Numeration	
4 Investigations, 2 Extensions, 4 Assessments	1
Lesson 2 – Data Analysis	
4 Investigations, 2 Extensions, 4 Assessments	5
Lesson 3 – Operations	
4 Investigations, 2 Extensions, 4 Assessments	9
Vocabulary Activity 1	13
Review 1	14
Lesson 4 – Number theory	
4 Investigations, 2 Extensions, 4 Assessments	15
Lesson 5 – Geometry	
4 Investigations, 2 Extensions, 4 Assessments	19
Lesson 6 – Measurement	
4 Investigations, 2 Extensions, 4 Assessments	23
Lesson 7 – Pre-Algebra	
4 Investigations, 2 Extensions, 4 Assessments	27
Vocabulary Activity 2	31
Review 2	32
Final Review	33
CSF Cross-reference chart	37
Teacher Notes and Solutions	38
Reproducible Resource Pages	50

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HAWKER BROWNLOW
E D U C A T I O N

★ TO THE TEACHER ★

Book 6, CSF Level 4

One of the most important aspects of teaching maths is communication. Writing, speaking, explaining or drawing can help your students internalise what they have learned and clarify their own thinking. Communication can also act as a powerful tool for you to assess the thinking of your students.

Your students should be encouraged to use strategies that foster the art of communication. We have incorporated a variety of strategies for your students to utilise in *Maths the Write Way*. These include asking the students to:

- Write their own word problems
- Communicate orally
- Identify key words and explain their importance
- Create their own games, puzzles, poems
- Summarise their work
- Investigate other ways to solve a problem
- Make predictions and draw conclusions
- Work with a group to share ideas and solve problems.

Maths the Write Way contains seven lessons. Each lesson includes four Investigations, two Extensions and four Assessments. Two Assessments are with open-ended responses whilst two utilise multiple choice format.

Vocabulary activities, following Lessons 3 and 7, emphasise the importance of mathematical language. Two mini-reviews and a Final Review will help you to assess the work of your students.

In *Maths the Write Way*, we have provided a forum for you to instruct as well as assess. We encourage students to look for a variety of ways to solve problems. The process – not just the solution – must be emphasised. Working and sharing ideas in co-operative groups will enhance understanding and communication.

The Teacher Guide includes:

- Listing of lesson objectives and necessary materials
- Key vocabulary and concepts for the lesson
- Suggestions for discussing key mathematical concepts
- Sample solutions to all Investigations and Assessments
- Suggested strategies for solving problems
- Reproducible pages for use with selected activities

The program will with a variety of instructional approaches. You may want to complete some activities with the whole class. Others may be more appropriate for individuals or small groups. Depending on your students' reading abilities, you may want to read aloud the directions for each activity before assigning it. Most investigations end with an oral explanation and/or writing activity. If students are not ready to write, you may want to record their answers on an experience chart. The oral explanations and writing activity are crucial to the Investigations, as they help students clarify thinking.

We are sure you will find *Maths the Write Way* a valuable resource for supplementing and enhancing your mathematics instructional program.

★ INVESTIGATION 1 ★

Trains are an important form of transportation used by millions of people around the world. There are many expenses involved in operating railway systems in different cities.

Step 1: Look at the chart below.

1994 Railway Operating Expenses (in dollars)

City	Operating Expenses	To Nearest Hundred Thousand
Melbourne	299,381	300,000
Sydney	119,560	100,000
Brisbane	334,749	300,000
Adelaide	210,514	200,000
Perth	180,676	200,000
Hobart	2,243,408	2,200,000

Step 2: Using the chart, write a general rule that will show how to round any number to the nearest hundred thousand.

Hint: Which numbers in the chart are rounded up? Which are rounded down?

Solution:

★ INVESTIGATION 2 ★

Step 1: Look at the number sentences below.

Number

$$465,026 = 400,000 + 60,000 + 5,000 + 20 + 6$$

$$465,026 = (4 \times 100,000) + (6 \times 10,000) + (5 \times 1,000) + (2 \times 10) + (6 \times 1)$$

Step 2: Imagine that you are a maths teacher.

Write a brief explanation of the meaning and purpose of expanded notation.

Hint: Think about how expanded notation relates to each digit in a number.

Solution:

★ EXTENSION ★

Use the facts in the chart for Investigation 1 to write your own two-step word problem. Have a group member solve your problem.

Hint: Solve the problem yourself to be sure it works.

Solution:

Assessment 1

Which of these represents the following expression in standard form?

$$500,000 + 6,000 + 50 + 9$$

- A. 506,590
- B. 5,659
- C. 560,059
- D. 506,059

Assessment 2

Rounded to the nearest hundred thousand, the population of Kingsville is 400,000. What range of numbers shows what the actual population might be? Write an explanation of how you determined your answer.

Solution:

Part B

★ INVESTIGATION 3 ★

Step 1: Speed skating is a popular event in the Winter Olympics. Study the chart below. It shows the winning times in the women's 1,000 metre event during past Olympic Games.

Women's 1,000-Meter Speed Skating

Year	Winner	Country	Time
1994	Bonnie Blair	U.S.A.	1:18.74
1992	Bonnie Blair	U.S.A.	1:21.90
1988	Christa E. Rothenburger	Germany	1:17.65
1984	Karin Enke	E. Germany	1:21.61
1980	Natalya Petrusheva	U.S.S.R.	1:24.10

Step 2: Write three word problems that compare the various times of the skaters. Make sure that each problem asks a different question.

Hint: The times show minutes, seconds and parts of a second.

Solution:

★ INVESTIGATION 4 ★

When you multiply 10 by itself, you create a power of 10. You can do this again and again.

Examples: 10×10
 $10 \times 10 \times 10$
 $10 \times 10 \times 10 \times 10$

Powers of 10 can be expressed more efficiently using exponents.

Step 1: Study the information below. The raised numbers that follow 10 are exponents.

$$\begin{aligned}10 &= 10, \text{ or } 10^1 \\10 \times 10 &= 100, \text{ or } 10^2 \\10 \times 10 \times 10 &= 1,000, \text{ or } 10^3 \\10 \times 10 \times 10 \times 10 &= \underline{\quad} \text{ or } \underline{\quad} \\10 \times 10 \times 10 \times 10 \times 10 &= \underline{\quad} \text{ or } \underline{\quad} \\10 \times 10 \times 10 \times 10 \times 10 \times 10 &= \underline{\quad} \text{ or } \underline{\quad}\end{aligned}$$

Step 2: First finish the chart below. Then look for and write a description of any patterns you find.

Hint: Look carefully at each product and the exponent that goes with it.

Solution:

★ EXTENSION ★

Look back at the table in Investigation 3. Based on this information, make a prediction about the winning time for this event in the next Olympic Games. Imagine that you are a sportswriter for your local newspaper. Write a paragraph from a column that gives your prediction. Provide reasons to support your ideas.

Hint: Study and consider all information included in the table.

Solution:

Assessment 1

Which decimal is less than 25.489 and greater than 25.234?

- A. 25.149
- B. 2.589
- C. 25.439
- D. 25.894

Assessment 2

What is the value of 10^7 ? Write an explanation of how you determined your answer.

Solution:
