

★ TABLE OF CONTENTS ★

Book 8, CSF Level 5

	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 – 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	52

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E D U C A T I O N

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★ TO THE TEACHER ★

Book 8, CSF Level 5

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 ★

Step 1: Read the following:

The United States of America is one of the largest countries in the world, in terms of both area and population. The area of the United States is about 5,796,000 square kilometres and its population is about 250,000,000. This diverse population includes millions of people who were born in foreign countries. Estimates indicate that about 6,264,000 of the United States population were born in Mexico, about 718,000 in El Salvador, and about 4,003,000 in the Philippines.

Step 2: Express all numbers above using scientific notation. Then write an explanation of how to write a number using scientific notation.

Hint: Think about the relationship between place value and exponents in scientific notation.

Solution:

★ INVESTIGATION 2 ★

Step 1: Read the following information.

Because of the world's dependency on energy, countries stockpile energy sources into reserves. The chart below gives an indication of about how many barrels of crude oil were placed in reserves in the mid-1990s.

<u>Region of the World</u>	<u>Crude Oil in Barrels</u>	<u>Rounded to Nearest Billion</u>
N. America	72,100,000,000	72,000,000,000
Central & S. America	77,700,000,000	78,000,000,000
W. Europe	38,500,000,000	39,000,000,000
E. Europe/ former USSR	183,000,000,000	183,000,000,000
Middle East	595,400,000,000	595,000,000,000
Africa	73,900,000,000	74,000,000,000
Far East	53,300,000,000	53,000,000,000

Step 2: Using the chart, write a general rule that will show how to round all numbers to the nearest 1,000,000,000.

Hint: Compare the rounded numbers to the original numbers.

Solution:

★ EXTENSION ★

Create an appropriate graph to display the information in Investigation 2. Graph the rounded numbers. Then write a paragraph describing the information. Share your paragraph with your group members.

Hint: Look carefully at the range of data to help you set up your graph.

Solution:

Assessment 1

What is 938,621,548,609 rounded to the nearest billion?

- A. nine hundred thirty billion
- B. nine hundred forty billion
- C. nine hundred thirty-nine billion
- D. nine hundred thirty-eight billion

Assessment 2

The average distance from the earth to the sun is 9.296×10^7 kilometres. What is this number expressed in standard notation? Write an explanation of how you determined your answer.

Solution:

Part B

★ INVESTIGATION 3 ★

Step 1: In a cross-country automobile race, drivers receive a map of the route, including the expected number of kilometres to travel each day. On day 1, one driver completed $\frac{7}{8}$ of the expected mileage. A second driver completed 89% of the expected mileage. Use grid paper to find a way of proving which driver travelled the greater distance on day 1.

Step 2: Write a statement to describe what your grid model shows.

Hint: How many total squares should there be in your grid?

Solution:

★ INVESTIGATION 4 ★

Mrs Barbara's class competed in a readathon. The goal for a 6-month period was for each student to read about 30 books.

Step 1: Look carefully at the information below.

Sample Population for Class Readathon— Amount of 6-Month Goal Completed

	Sept.	Oct.	Nov.
Jennifer	25%	25%	25%
Michael	0.1	0.1	0.1
Lakesha	5%	10%	15%
Jamal	0.1	0.2	0.3

Step 2: Based upon your interpretation of this information, do you think Mrs Barbara's class will reach the goal? Write about your ideas and conclusions. Make sure to include data to support your answers. Share your results with your group members.

Hint: First express all values in like terms.

Solution:

★ EXTENSION ★

Create a table of information such as the one in Investigation 4. Include the use of fractions, decimals and per cents in your data. However, do not include a title or any labels. Have a member of your group look at the given information and create a name and labels. Then discuss with the group whether the names and labels are appropriate for the information given and why.

Hint: Try to provide data that will give a variety of choices as to title and labels. You may want to use an almanac.

Solution:

Assessment 1

Which of the following is **not** another way of writing 175%?

- A. 17.5
- B. 1.75
- C. $1\frac{3}{4}$
- D. $\frac{175}{100}$

Assessment 2

How many fractions in this box are less than 50%? Write an explanation of how you determined your answer.

$\frac{7}{14}$	$\frac{2}{5}$	$\frac{6}{13}$	$\frac{2}{3}$
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Solution:
