

# ★ TABLE OF CONTENTS ★

|                                      | <b>Page</b> |
|--------------------------------------|-------------|
| To the Teacher.....                  | 1           |
| Lesson 1—Numbers and Numeration..... | 2           |
| Lesson 2—Data Analysis.....          | 3           |
| Lesson 3—Operations.....             | 4           |
| Vocabulary Activity 1.....           | 5           |
| Lesson 4—Number Theory.....          | 5           |
| Lesson 5—Geometry.....               | 6           |
| Lesson 6—Measurement.....            | 7           |
| Lesson 7—Pre-algebra.....            | 8           |
| Vocabulary Activity 2.....           | 9           |
| Review.....                          | 10          |
| Reproducibles.....                   | 11          |

## **AUTHORS**

### ***Maths the Write Way, Teacher Guide Level 1***

Dr Brian E. Enright is an author and a national mathematics education consultant.

Dr Robert Gyles is the deputy superintendent for Community School District #4 in New York City.

Maxine Leonescu is the director of mathematics for Community School District #11 in New York City.

Fred I. Remer is the director of mathematics, science, and technology for Community School District #9 in New York City.

**HAWKER BROWNLOW**  
**E D U C A T I O N**

© 1998—Curriculum Associates, Inc.  
© 1998 Hawker Brownlow Education

All rights reserved. Printed in Australia

ISBN 1 86401 739 2 Code #1952

The materials in this text and the manual are the property of Hawker Brownlow Education. As a classroom teacher, you may copy whatever reproducible pages are provided for use with your students. As a trainer you may copy whatever reproducibles are provided in the text or manual for use with inservice training programs in your school—provided such work is part of your regular work and you receive no special compensation for that inservice work.

## ★ TO THE TEACHER ★

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 many of the following strategies for your students in ***Maths the Write Way***.

- ★ Write your own problems
- ★ Communicate orally
- ★ Identify key words and explain their importance
- ★ Create your own game, puzzle, picture, poem or rap
- ★ Summarise your work
- ★ Investigate to find 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 two Investigations, two Assessments and a Home Involvement activity. The Home Involvement activities are also included as Reproducibles at the back of this Teacher Guide. You can make copies and distribute these pages for students to take home. Hints are included to provide clues to the solution. Vocabulary activities, following Lessons 3 and 7, emphasise the importance of mathematical language. The Review will help you 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 cooperative 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

This program will work 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. Make sure students understand what they are supposed to do for each activity. Depending on your students' abilities, you may want to read aloud the directions for each activity before assigning it. Most Investigations end with an oral explanation and/or a writing activity. If students are not ready to write, you may want to record their answers on an experience chart. The oral explanation 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.

Brian E. Enright  
Robert Gyles  
Maxine Leonescu  
Fred I. Remer

Pages 2–4

**Objectives**

- ★ To identify numbers that come before, after or between given numbers
- ★ To count forward and backward at least through 50
- ★ To count by tens
- ★ To understand place value of numbers at least through 99 and express these numbers in expanded form

**Materials**

- ★ Reproducible 1: *Numbers*
- ★ Scissors
- ★ Paste
- ★ Crayons
- ★ Reproducible 8: *Lesson 1 Home Involvement*

**Vocabulary**

Before beginning the lesson, you may wish to review the following maths terms and concepts: *after, backward, before, between, forward, grouping by tens, order.*

**Teacher Notes**

As students compare and order numbers, they build number sense. These skills are essential in laying the foundation for place value. Students also need ample opportunities using hands-on materials. Manipulatives help build an understanding of our place-value system. The use of a hundreds chart as an extension will strengthen students' ability to make connections between numbers and operate more effectively.

Answers to Investigations and Assessments will vary. Sample solutions are provided.

**Investigation 1**

Distribute copies of Reproducible 1. Read the directions with students. Tell students to cut out all the animals. Explain that students must put the animals in the correct order using the numbers. Point out the < symbol and explain its significance. If students are unfamiliar with

the symbols < and >, show some examples using different numbers of objects. Make sure students understand that the numbers should be placed in increasing order from left to right. elephant (18), camel (29), lion (39), horse (49)

To put the numbers in order, first compare the tens digits. Since the tens digits in the numbers are all different, you don't have to look at the ones digits.

**Investigation 2**

Read the directions with students. Make sure that students understand that they should circle only groups of 10 biscuits.

Check to see that students correctly circled groups of 10 biscuits.

1. 65
2. 6 plates
3. 5 biscuits
4. Put the biscuits in groups of 10. Then count the biscuits that are left over.

**Assessment 1**

The missing number is 29. Count backward from 32 by ones to find the missing number.

**Assessment 2**

The missing number is 4 because there is a 4 in the ones column of the answer and  $30 + 4$  is equal to 34. You can also count up from 30 to 34 to find the answer.

**Home Involvement**

Distribute copies of the Home Involvement page for Lesson 1 (Reproducibile 8). Have students take home the page to share with their families.

*Solution:*

5 tens and 8 ones = 58 buttons all together

## LESSON 2

# Data Analysis

Pages 5–7

### Objectives

- ★ To collect and organise data
- ★ To read and interpret data in a pictograph
- ★ To read and interpret data in a bar graph
- ★ To graph data
- ★ To understand the importance of graphs in everyday life

### Materials

- ★ Crayons
- ★ Reproducible 9: Lesson 2 Home Involvement

### Vocabulary

Before beginning the lesson, you may wish to review the following maths terms and concepts: *bar graph, data, pictograph, survey, table.*

### Teacher Notes

Graphs play an important part in everyday life as a way of learning and understanding data. It is important that students collect and display data on a regular basis in all subject areas. Experiences with labelling and titling graphs will help students strengthen their ability to interpret information.

Have students conduct their own surveys as a means of gathering information. When students create their own questions, they show that they know how to interpret the data.

Answers to Investigations and Assessments will vary. Sample solutions are provided.

### Investigation 1

Read the directions with students. You may wish to brainstorm ideas about the purpose and content of the pictograph. In this activity, students write a title for the graph. Since the answers may vary, have students explain why their title is appropriate.

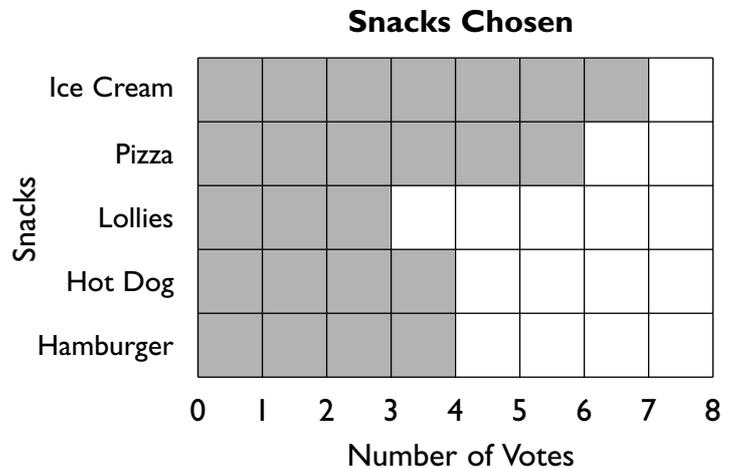
Possible title: Zoo Animals

Possible sentences:

- There are 4 lions, 2 tigers, 5 elephants and 3 leopards at the zoo.
- There are 14 animals at the zoo.

### Investigation 2

Read the directions with students. Make sure that students understand that they are to make a bar graph that shows the same information as the table. Remind students to include a title and colour one box to stand for each person. You may want to put students in pairs so that they can exchange questions.



Possible question: How many students chose pizza as a snack? (6)

### Assessment 1

Sea lions and seals have the same number of shows. Since there are 3 pictures of each of these animals, they have the same number of shows.

### Assessment 2

The fewest number of students chose cordial. To find the answer, look for the bar with the fewest number of boxes shaded.

### Home Involvement

Distribute copies of the Home Involvement page for Lesson 2 (Reproducible 9). Have students take home the page to share with their families.

## Pages 8–10

**Objectives**

- ★ To explore different ways to find a given sum
- ★ To understand that there can be more than one solution to a problem
- ★ To gain number sense through subtraction
- ★ To explore strategies for subtraction

**Materials**

- ★ Reproducible 2: 5 cent pieces
- ★ Scissors
- ★ Crayons
- ★ Reproducible 10: Lesson 3 Home Involvement

**Vocabulary**

Before beginning the lesson, you may wish to review the following maths terms and concepts: *addition sentence, number sentence.*

**Teacher Notes**

Investigation 1 gives students the opportunity to explore strategies for learning and reinforcing number facts. For example, some students might count up from 13 to 20, and others will count back from 20 to 13. Other students might have a strong understanding of the number 5 as a benchmark number. They might count from 13 to 15 and then add on 5 or do the reverse. Activities like this can help students see number relationships.

Frequently, students do not look beyond one way to solve a given problem. Investigation 2 will help strengthen a student's understanding of number facts and at the same time show that there can be multiple solutions to a given problem. An extension of this activity might be to have students create their own 'coin' problem, find their own solutions, and share their problems with other members of the class.

Answers to Investigations and Assessments will vary. Sample solutions are provided.

**Investigation 1**

Read the directions with students. Explain that students need to figure out how many more cents Luther needs to get a bonus. You may wish to review coin values.

Students should mark 3 x 5 cent pieces. Luther has 15 cents. Count up from 15 to 20. Luther needs 5 more cents to get the bonus.

**Investigation 2**

Distribute copies of Reproducible 2. Read the directions with students. Make sure that students understand the example. Point out the relationship between the two groups of coins and the number sentence. Explain that students need to find other ways to group the 16 coins.

1 + 15 / 15 + 1  
 2 + 14 / 14 + 2  
 3 + 13 / 13 + 3  
 4 + 12 / 12 + 4  
 5 + 11 / 11 + 5  
 6 + 10 / 10 + 6  
 7 + 9 / 9 + 7  
 8 + 8

**Assessment 1**

$$8 + 4 = 12$$

Eight circles plus four circles are equal to twelve circles.

**Assessment 2**

Students should colour 2 20¢, 2 10¢, and 1 5¢. Try different groups of coins until you find a group that adds up to 65 cents.

**Home Involvement**

Distribute copies of the Home Involvement page for Lesson 3 (Reproducible 10). Have students take home the page to share with their families.

1 + 17 / 17 + 1  
 2 + 16 / 16 + 2  
 3 + 15 / 15 + 3  
 4 + 14 / 14 + 4  
 5 + 13 / 13 + 5  
 6 + 12 / 12 + 6  
 7 + 11 / 11 + 7  
 8 + 10 / 10 + 8  
 9 + 9

## ★ VOCABULARY ACTIVITY I ★

### Page 11

1. bar graph
2. tens
3. pictograph
4. ones
5. 3 tens, 4 ones = 34
6.  $3 + 5 = 8$  and  $4 + 4 = 8$

## LESSON 4

## Number Theory

### Pages 12–14

#### Objectives

- ★ To understand what makes a number odd or even
- ★ To identify odd and even numbers
- ★ To learn and identify the ordinal position of objects

#### Materials

- ★ Reproducible 3: *Sea Creatures*
- ★ Scissors
- ★ Paste
- ★ Crayons
- ★ Reproducible 11: *Lesson 4 Home Involvement*

#### Vocabulary

Before beginning the lesson, you may wish to review the following maths terms and concepts: *even number, odd number, ordinal numbers (first – tenth)*.

#### Teacher Notes

As students group pairs of objects, they discover the difference between odd and even numbers.

This concrete representation can lead to a more thorough understanding of the meaning of and relationships between odd and even numbers.

Understanding position is an important life skill. Students are always involved in activities that require someone to go first, second and so on. Give students many opportunities to position various objects and label them. Involve students in games in which they are asked to change position. Daily activities, such as lining up, can be used to practice ordinal numbers.

Answers to Investigations and Assessments will vary. Sample answers are provided.

#### Investigation 1

Read the directions with students. Have students study the examples. Make sure that students understand that the objects for each number are grouped in pairs. Ask them to describe the difference between the groups of