Australian

Signpost MATHS

NSW

3

Alan McSeveny

Diane McSeveny-Foster

Bob Collard

Alan Parker

Rachel McSeveny

Short Contents

Come in and crunch some numbers.

What is Australian Signpost Maths NSW?

Australian Signpost Maths NSW is a mathematics activity book series for students from Kindergarten to Year 6. The series has been written to meet the requirements of the Australian Curriculum: Mathematics in NSW.

The components of the series include Student Books, Teacher's Books, Mentals Books and an interactive

Website. Teachers can select an appropriate program for every student from the rich and varied material provided.

The content has been carefully sequenced within each year level and across the series to take into account students' likely mathematical development.

Student Books

Teacher's Books

Mentals Books

Website

Structure of Australian Signpost Maths NSW

Australian Signpost Maths NSW emphasises the curriculum's syllabus content as well as problem-solving strategies, language development and the use of technology.

The syllabus is organised into three content strands and the Working Mathematically proficiency strand.

Content Strands

- Number and Algebra
- Measurement and Geometry
- Statistics and Probability

Working Mathematically

- Communicating
- Problem Solving
- Reasoning
- Understanding
- Fluency

Australian Signpost Maths NSW also provides opportunities to develop other general capabilities, such as personal and social competence and intercultural understanding.

This is Australian Signpost Maths NSW.

To maximise the benefits of the program, the Student Book, Teacher's Book, Mentals Book and Website should be used together.

The structure of the **Student Book** allows teachers to determine both the order and the extent of content covered. Strands are organised separately so that the teacher, not the Student Book, decides the content of the next lesson. However, a suggested term program (see page X of this book) and a detailed program (see the Teacher's Book and Website) are also provided.

The **Teacher's Book** also provides lesson plans for each page of the Student Book and blackline masters to assist teachers in implementing the program.

The **Mentals Book** mixes examples from all strands. It revises the content covered in the Student Book. Each content strand is thoroughly covered, with the proficiency strands incorporated within each section. A special feature woven throughout the Mentals Book is the tables program in the four operations.

The innovative **Website** helps teachers to bring mathematics alive with technology. The website provides interactive maths tools, games and practice opportunities as well as relevant resource masters and worksheets for all year levels. These can be used for whole-class, small-group and individual learning. The website also includes **Concept Check-In** a new diagnostic screener.

Student Book pages are colour-coded by section.

Number and Algebra A	**Measurement and Geometry A**	**Statistics and Probability**
Number and Algebra B	**Measurement and Geometry B**	**Answers**

Structure of NSW Mathematics K–6, Australian Curriculum

The K–6 Mathematics Syllabus content is described in Early Stage 1, Stage 1, Stage 2 and Stage 3. Students develop at different rates, but Stage 2 describes the content expected to be covered in Years 3 and 4.

The outcome reference MA2-4NA refers to Mathematics Stage 2, Substrand 4 in the Number and Algebra strand. Relevant syllabus outcomes are shown in the Contents

and Syllabus Overview on page vi, in the Teacher's Book and in the planning documents on the website.

The Working Mathematically strand pervades each of the other strands.

The syllabus strands and substrands covered in Stage 2 are shown below.

Working Mathematically	Number and Algebra	Measurement and Geometry		Statistics and Probability
Communicating Problem Solving Reasoning Understanding Fluency MA2-1WM, MA2-2WM, MA2-3WM	Whole Numbers MA2-4NA	Length MA2-9MG	Three-Dimensional Space MA2-14MG	Data MA2-18SP
	Addition and Subtraction MA2-5NA	Area MA2-10MG	Two-Dimensional Space MA2-15MG	Chance MA2-19SP
	Multiplication and Division MA2-6NA	Volume and Capacity MA2-11MG	Angles MA2-16MG	
	Fractions and Decimals MA2-7NA	Mass MA2-12MG	Position MA2-17MG	
	Patterns and Algebra MA2-8NA	Time MA2-13MG		

Special Features of Australian Signpost Maths NSW

- **Traffic Light** system allows students to reflect on their work and highlight any units that they are having trouble understanding. They tick the red for units they feel they still don't understand, and green for those they feel they understand fully.

- Exercises are **well graded**. New work is reinforced in the Mentals Book.

- **Answers** are supplied in the back of this book as well as in the Teacher's Book.

- **Concept Check-In** diagnostic screener (on the Website) provides a snapshot of the class' conceptual understandings to aid in classroom management. It also allows teachers to measure progress over time.

- The eight **Diagnostic Tests** (now also in the back of this book) allow the teacher to discover each student's strengths and weaknesses, and the cross-references direct students to the pages where that work is introduced.

- The **Dictionary** at the beginning of this Student Book will help students to learn the language of mathematics.

- **ID Cards** (in the Mentals Book, Teacher's Book and Website) review the language of mathematics by asking students to identify common terms, shapes and symbols.

- Important **rules and concepts** are clearly highlighted.

- **Worked examples** and explanations are given throughout the Student Book where new ideas are introduced.

- The use of **colour** makes emphasis clear and is highly motivating.

- **Cartoons** give instruction and friendly advice.

- **Interactive activities** are provided on the website for whole-class, small-group and individual learning.

Australian Signpost Maths NSW has some very attractive features.

Australian Signpost Maths NSW Icons

Signpost icons are used throughout the book as cues to the essential nature of exercises and activities, and as a guide to ways of engaging with them. These icons often indicate alternative or more concrete approaches to dealing with concepts.

CONCEPT — This icon highlights **important rules and concepts** occurring throughout the book. It often appears with worked examples.

ACTIVITY — Activities provide **applications and enrichment**. These activities usually involve the use of concrete materials and partner or group work.

FUN SPOT — These enjoyable activities are used to **motivate and involve** students in mathematical pursuits. They usually involve games and puzzles.

INVESTIGATION — Investigations allow students to **explore and discover** maths concepts.

ICT — This icon indicates the use of computers, calculators or other **information and communications technology**.

KEY

■	Number and Algebra
■	Measurement and Geometry
■	Statistics and Probability

Working Mathematically pervades all of the strands as indicated by the 'WM' outcomes.

Page	Unit	Title	Content	Counting and numeration	Place value	Fractions	Number patterns	Syllabus Outcomes	Suggested progress
		Number and Algebra A							
1	1:01	Skip Counting					●	MA2-1WM, -2WM, -6NA, -8NA	Term 1
2	1:02	Odd and Even Numbers		●			●	MA2-1WM, -2WM, -3WM, -8NA	
3	1:03	Numbers to 1 000		●	●			MA2-1WM, -2WM, -4NA	
4	1:04	Numbers to 1 000		●	●			MA2-1WM, -4NA	
5	1:05	Counting		●			●	MA2-1WM, -2WM, -3WM, -8NA	
6	1:06	Counting		●			●	MA2-1WM, -2WM, -3WM, -4NA	
7	1:07	Numbers to 1 000		●	●			MA2-1WM, -4NA	
8	1:08	Numbers to 1 000		●	●			MA2-1WM, -2WM, -3WM, -4NA	T1, T2*
9	1:09	Fractions of a Whole				●		MA2-1WM, -7NA	Term 2
10	1:10	Fractions of a Collection				●		MA2-1WM, -7NA	
11	1:11	Numbers to 10 000		●				MA2-1WM, -4NA	
12	1:12	Numbers to 10 000		●	●			MA2-1WM, -2WM, -4NA	
13	1:13	Fractions				●		MA2-1WM, -3WM, -7NA	
14	1:14	Comparing Fractions				●		MA2-1WM, -7NA	
15	1:15	Number Patterns					●	MA2-1WM, -3WM, -6NA, -8NA	
16	1:16	Numbers to 10 000		●	●		●	MA2-1WM, -4NA	T3, T4*
17	1:17	Ordering Numbers		●				MA2-1WM, -4NA	Term 3
18	1:18	Rounding		●	●			MA2-1WM, -3WM, -4NA	
19	1:19	Fractions				●		MA2-1WM, -3WM, -7NA	
20	1:20	Mixed Numerals				●	●	MA2-1WM, -7NA	
21	1:21	Fractions and the Number Line				●	●	MA2-1WM, -7NA	
22	1:22	Fractions in Our World				●		MA2-1WM, -2WM, -3WM, -7NA	
23	1:23	Numbers to 10 000		●	●			MA2-1WM, -4NA, -8NA	
24	1:24	Place Value to 10 000		●	●			MA2-1WM, -4NA	
25	1:25	What's the Rule?					●	MA2-1WM, -3WM, -8NA	
26	1:26	Number Patterns		●			●	MA2-1WM, -3WM, -6NA, -8NA	
27	1:27	Expanded Notation		●	●			MA2-1WM, -2WM, -4NA	T5, T6*
28	1:28	Numbers to 10 000		●			●	MA2-1WM, -4NA, -5NA, -8NA	Term 4
29	1:29	Number Patterns		●			●	MA3-1WM, -2WM, -7NA, -8NA	
30	1:30	Number Patterns					●	MA2-1WM, -5NA, -6NA, -8NA	
31	1:31	Fraction Patterns				●	●	MA2-1WM, -2WM, -7NA	
32	1:32	Numbers to 10 000		●	●			MA2-1WM, -2WM, -4NA	
33	1:33	Expanded Notation		●	●			MA2-1WM, -4NA	
34	1:34	Numbers to 10 000		●	●			MA2-1WM, -4NA	
35	1:35	Place Value to 10 000		●	●			MA2-1WM, -4NA	
36	1:36	Numbers to 10 000		●	●			MA2-1WM, -4NA	T7, T8*
37	1:37	Making Number Patterns					●	MA2-1WM, -2WM, -5NA, -8NA	
38	1:38	Rounding		●	●			MA2-1WM, -2WM, -4NA, -5NA	

* Suggested placement for Diagnostic Tests 1 to 8. (See the Teacher's Book.)

Measurement and Geometry

Statistics and Probability

1	**Data**	**Pages**
	Data collection	149, 153, 154, 158, 161
	Graphs	148, 150, 153, 154, 155, 156, 157, 158, 160
	Tables	148, 149, 150, 155
2	**Chance**	
	Chance experiments	151, 152, 160
	Describing likelihood	151, 152, 159, 160

Maths is fun with Australian Signpost.

1 fish
2 fish

1:05 Counting
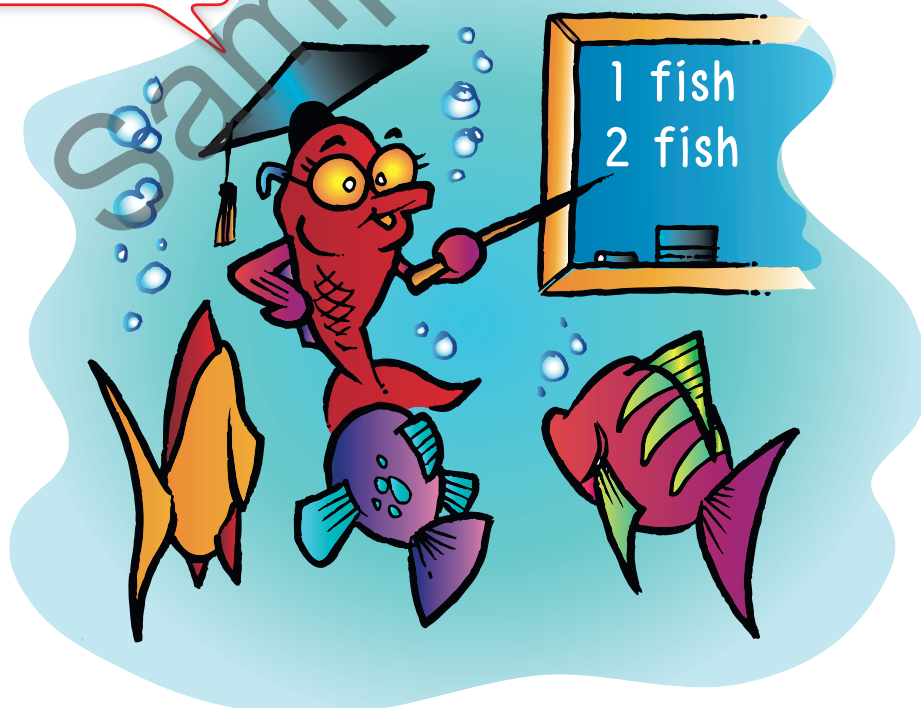
Number Chart

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1 Use the number chart to answer the questions.

a Count by 2s. Colour these numbers yellow.

b Starting at 100, count backwards by 10s. Draw a cross on these numbers.

c Circle every second even number up to 80. What do you notice?

d Count by 8s and tick the first 10 numbers you count. Write them below.

2 What do even numbers end in?

3 When we count by 5s from zero, the numbers end in [   ].

4 When we count by 10s from zero, the numbers end in [   ].

5 Continue each pattern. Check your answers with a calculator.

a 223, 233, 243, [   ], [   ], [   ], [   ], [   ]

b 815, 810, 805, [   ], [   ], [   ], [   ], [   ]

c 126, 124, 122, [   ], [   ], [   ], [   ], [   ]

d 1 000, 900, 800, [   ], [   ], [   ], [   ], [   ]

6 Show your answers to Questions 5**a** and 5**b** on the number lines.

a

223   233   243

The rule is [   ].

b

805   810   815

The rule is [   ].

1:06 Counting

1 **a** Count on from 76 to 100 by 2s.

b Count backwards from 1 000 by 100s.

c Count on from 645 to 690 by 5s.

d Count backwards from 500 to 400 by 10s.

> Understanding number relationships helps us count better.

2 Write the missing numbers.

a 865, ____, 845, ____, ____, 815, ____, ____, 785

b 625, 620, ____, ____, 605, ____, ____, ____, 585

c 412, 410, ____, ____, 404, ____, ____, ____, 396

3 Write the first 20 even numbers. Circle every second even number and discuss the pattern you see.

4 Count by 5s and write the first 20 numbers you count. Circle every second number and discuss the pattern.

5 If you have to count 300 ten-cent coins, what is the best counting strategy to make sure you count them correctly?

6 Show your answers to Questions 1**a** and 1**b** on the number line.

a

76   78   80

The rule is ____.

b

800   900   1000
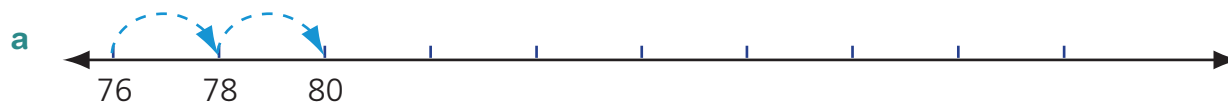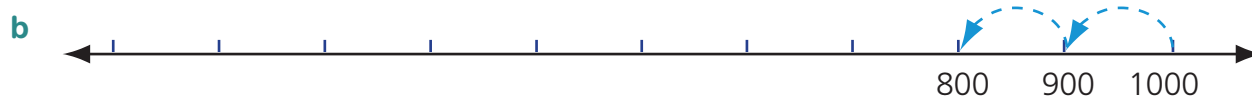
The rule is ____.

c Try to do Question 1**c** on your own number line.

1:07 Numbers to 1000

720 is the same as
7 hundreds and 2 tens
or 72 tens or 720 ones.

7 Hundreds 2 Tens 0 Ones

7 2 Tens 0 Ones

7 2 0 Ones
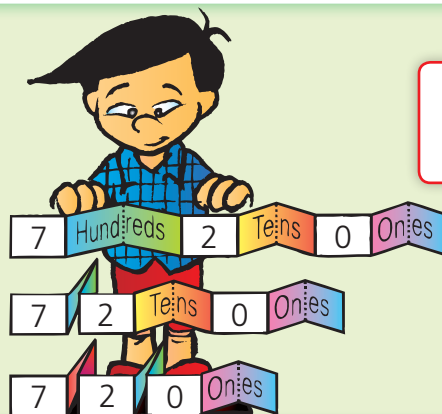
Numeral expanders help us understand the value of the numbers.
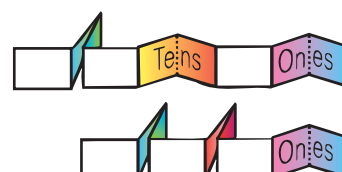
CONCEPT

① Complete the numeral expanders.

a 479 Hundreds   Tens   Ones

Tens   Ones

Ones

b 568 Hundreds   Tens   Ones

Tens   Ones

Ones

c 231 Hundreds   Tens   Ones

Tens   Ones

Ones

d 307 Hundreds   Tens   Ones

Tens   Ones

Ones
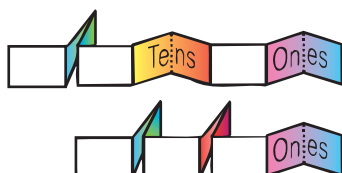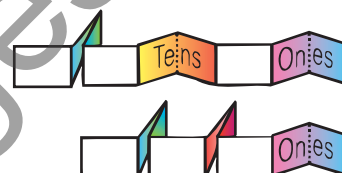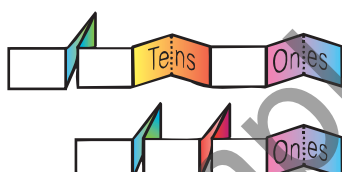
② Write each number as a numeral.

a six hundred and thirty-two ☐

b eight hundred and seventeen ☐

c four hundred and twenty-nine ☐

d seven hundred and sixty-three ☐

e two hundred and thirty-eight ☐

f five hundred and sixty-two ☐

g nine hundred and forty ☐

h three hundred and fifty-one ☐

③ Write each number in words.

a 156 ☐

b 607 ☐

c 319 ☐

d 841 ☐

○ Use concrete materials to show the numbers in Question 3.
Explain your answer to a partner.

ACTIVITY

H T U
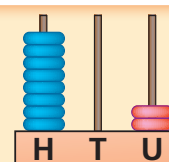
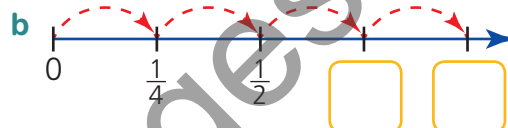The rule is **Add** $\frac{1}{4}$.

That is the same as $+ \frac{1}{4}$.

CONCEPT

$$0 \quad \frac{1}{4} \quad \frac{2}{4} \quad \frac{3}{4} \quad 1 \quad 1\frac{1}{4} \quad 1\frac{1}{2} \quad 1\frac{3}{4}$$
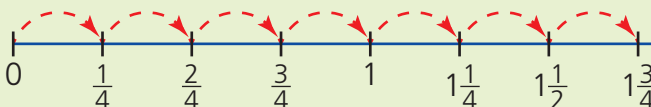
Rule: Add $\frac{1}{4}$

1 Complete each number line and write the rule.

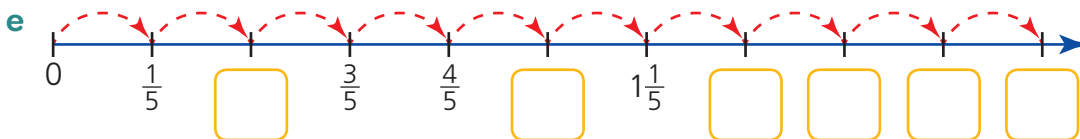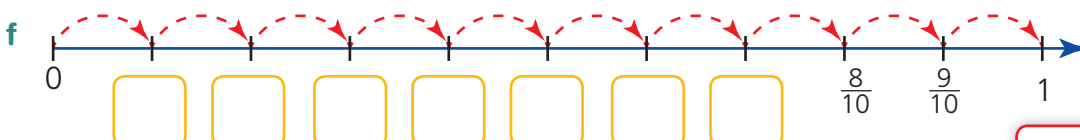**a**
$$0 \quad \frac{1}{2} \quad \square \quad \square \quad 2$$
Rule: _____

b
$$0 \quad \frac{1}{4} \quad \frac{1}{2} \quad \square \quad \square$$
Rule: _____

c
$$0 \quad \frac{1}{3} \quad \square \quad 1 \quad 1\frac{1}{3} \quad \square \quad \square \quad \square \quad 3 \quad \square$$
Rule: _____

d
$$0 \quad \square \quad \square \quad \square \quad \square \quad \square \quad 1 \quad 1\frac{1}{8} \quad 1\frac{2}{8}$$
Rule: _____

e
$$0 \quad \frac{1}{5} \quad \square \quad \frac{3}{5} \quad \frac{4}{5} \quad \square \quad 1\frac{1}{5} \quad \square \quad \square \quad \square \quad \square$$
Rule: _____

f
$$0 \quad \square \quad \square \quad \square \quad \square \quad \square \quad \square \quad \square \quad \frac{8}{10} \quad \frac{9}{10} \quad 1$$
Rule: _____

Be careful!

1:32 Numbers to 10 000
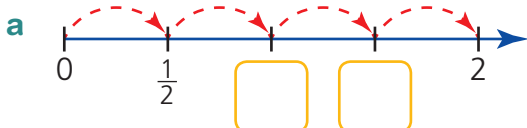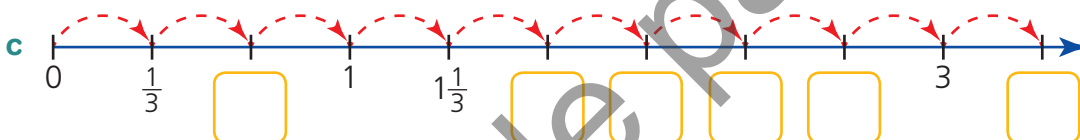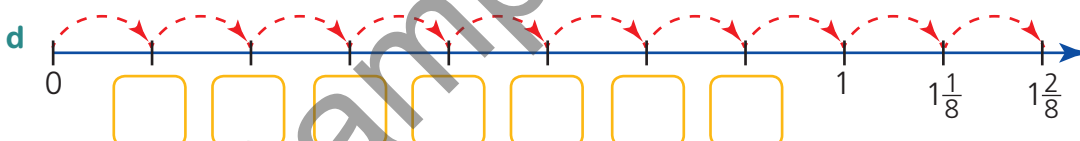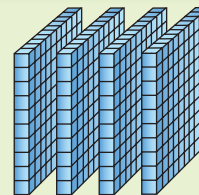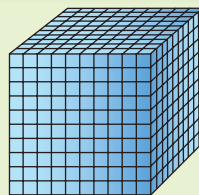
These two show the same number.

1 415

1 415

CONCEPT
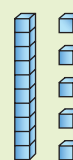
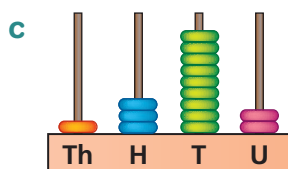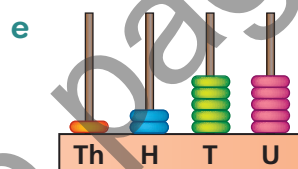**1** Write the number shown.

a

b
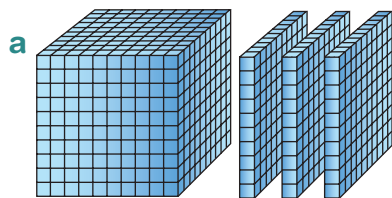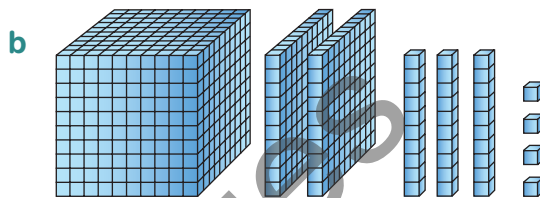
When a column is empty, we use a zero.

1 203

c Th H T U

d Th H T U

e Th H T U

f Th H T U

g Th H T U

h Th H T U
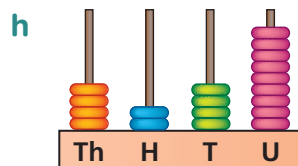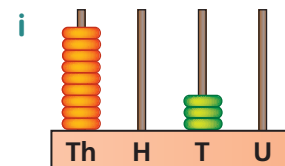
i Th H T U
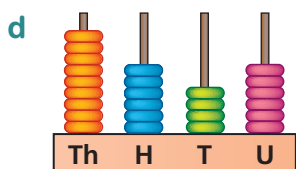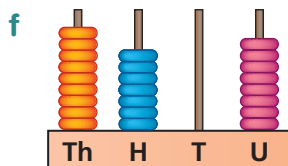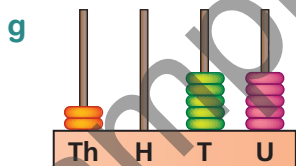
2 Write the value of the 6 in each number.

a 3 659

b 6 125

c 4 968

3 Order each group of numbers in ascending (A) and descending (D) order.

a 8 253, 8 532, 8 523, 8 235   A: _____, D: _____

b 7 694, 7 946, 7 469, 7 649   A: _____, D: _____

Wipe Out a Digit

- Enter a 4-digit number into a calculator.
- Your partner selects any digit to be **wiped out** — that is, changed to zero.
- Try to wipe out that digit by entering only **one** operation into the calculator. Did it work?
- Take turns with your partner. Score 1 point for each successful wipe-out.

ACTIVITY

Sample pages