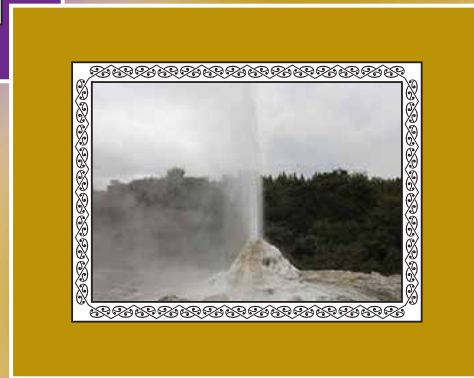
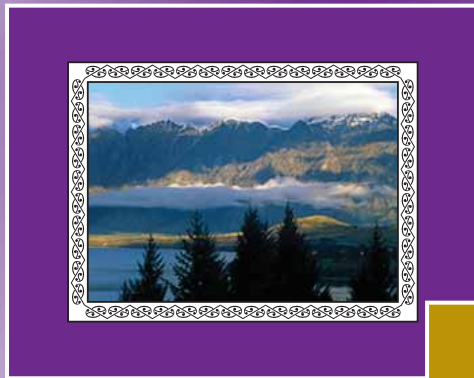
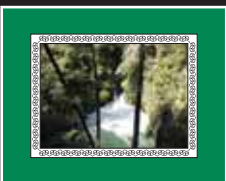
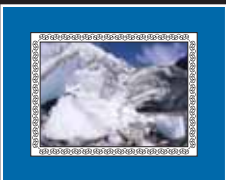
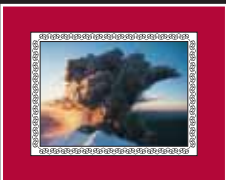


MATHS MATE Skill Builder

fourth edition



5.2

6.1

J. B. Wright



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Maths Mate Level 3.2	Student Pad - 4th Ed.	978 1 925114 14 0
Maths Mate Level 4.1	Student Pad - 4th Ed.	978 1 925114 15 7
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TEACHER'S GUIDE

FORWARD

Why use Skill Builders?

Too often, through the teaching, learning and assessment process, teachers identify weaknesses and gaps in student learning but the constraints of the classroom severely limit remediation opportunities.

The Maths Mate Skill Builder series was prepared in response to requests from teachers and parents who want an easy but effective way to help students who identify skill deficiencies using the Maths Mate Programme, and are motivated to do something about them.

The Maths Mate record keeping sheets found at the start of each term in each Student Pad (and on each CD ~ Record Keeping Sheets, pages 1 to 4) enable students to find out what they know and what they still need to learn and practise.

The Skill Builders extensively target through instruction and practice, all skills within the related Maths Mate Programme except the problem solving questions. The Problem Solving Hints & Solutions (see CD ~ Problem Solving Hints & Solutions) can be used by teachers to develop students' problem solving skills. The Skill Builders also contain a Glossary of important facts and reference material that will provide instant help when students present with difficulties.

Background to the design of Maths Mate and Skill Builders

MM5.2	1	2	3	4
MM6.1	1	2	3	4

Any question on the Maths Mate sheets is part of a set of 4 similar questions in the term. For example, consider sheets 1, 2, 3 and 4 in Level 5.2 term 1. Question 10 on each sheet is similar in design, content and degree of difficulty. This grouping of question style is also true of the next set of four sheets and so on. Thus the Maths Mate tests made available in the Teacher Resource Book and CD (see CD ~ Test Masters, pages 1 to 32 and Test Answers, pages 1 to 32) also reflect this grouping of question style and substance. Generally too, the Skill Builders can be linked to each set of 4 similar questions. These links are identified in the grid at the title of each skill. The grid shown here for example, would relate a skill to questions in the first 4 sheets of Level 5.2 term 1, the last 4 sheets of Level 5.2 term 2 and the first 4 sheets of Level 6.1 term 1. Once understood, these links will be helpful to students in their selection of Skill Builders and to you in your allocation of Skill Builders to students.

On each Maths Mate worksheet, questions 1 through to 32 get progressively harder. (Refer - How to use the Skill Builders, page iv)

Suggestions for the preparation and organisation of Skill Builders

Skill Builders can be downloaded free from the internet. Teachers can either direct students to the internet to download and print their own copies or save the entire Skill Builder to disc and photocopy at will. Rather than photocopying Skill Builders one at a time, you may find it helpful to set up a file in a central area that contains perhaps five copies of each Skill Builder. In this way you will save time and be prepared in advance. The Glossary too can be downloaded or photocopied for students as a resource.

How you can help

We are confident that your students will be rewarded for the effort you have made in making these worksheets available to them. As with any programme, however, there is always room for improvement and we place great value in feedback from people like yourself. Please, if you have any suggestions at all, contact us.

HOW TO USE MATHS MATE SKILL BUILDERS

1. Determine which Maths Mate questions pose a difficulty

If a student gets one or more incorrect answers, represented by one or more successive unshaded boxes on their worksheet results sheet, then that question requires a Skill Builder.

For example, question 11 in Sheets 1, 2, 3 and 4 is not shaded, so Skill 11.1 from Skill Builder 11 needs to be handed to the student.

MATHS MATE		Name: John Keuneman	
level 5.2		Class: 10J	
Worksheet Results		Teacher: Mr Jacques	
Term 1	Sheet 1	Sheet 2	Sheet 3
1. [Long x,-]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. [Decimal x,-]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. [Decimal x,-]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. [Fraction x,-]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. [Fraction x,-]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. [Percentages]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. [Decimals / Fractions / Percentages]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. [Integer x,-]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. [Rates / Ratios]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. [Indices]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. [Square Roots]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. [Exploring Number]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. [Financial Mathematics]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. [Number Patterns]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. [Expressions]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. [Substitution]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. [Expansion]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. [Factorisation]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. [Equations]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. [Coordinate Geometry]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. [Units of Measurement / Time]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. [Perimeter / Area]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. [Surface Area]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. [Volume]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. [Pythagoras]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. [Angles]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. [Geometric Reasoning]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. [Statistics]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. [Probability]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. [Problem Solving 1]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. [Problem Solving 2]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Total Correct	22	23	27

2. Find the relevant Skill Builder on the Maths Mate worksheet results sheet

Check across the question that is posing difficulties on the worksheet results sheet to find the list of skills within the Skill Builder that are most relevant to that question.

Obtain a copy of one or all of the skills listed for that question (pages 1 to 384). You can also double check with the grid at the right of each skill title, that the chosen skill is appropriate.

Remember, students should work through the skills in order. The skills where possible are arranged in increasing degree of difficulty.

Be aware that some skills may require the knowledge of previous skills, so when a student has several areas of weakness, they should work on the lowest numbered skill builders first. For example, a student struggling with Q4 and Q7 may need to build skills required for Q4 before they can improve Q7.

11. [Indices]

Skill 11.1: For numbers written in index form, multiply the base by itself as many times as the index.

Observe the index. The index tells you how many times to multiply the base.

Base 5⁴ Index 4

$5^4 = 5 \times 5 \times 5 \times 5$ (multiplied by itself 4 times)

$6^0 = 1$ $3^1 = 3$ $4^2 = 4 \times 4 = 16$ $2^3 = 2 \times 2 \times 2 = 8$

number to the power of 0 = 1 number to the power of 1 = itself square cube

Q. $2^4 =$ A. $2^4 =$
 $= 2 \times 2 \times 2 \times 2$
 $= 16$ (multiplied by itself 4 times)

a) $3^4 =$ b) $2^4 =$ c) $2^4 =$
 $= 3 \times 3 \times 3 \times 3 = 81$ $= 2 \times 2 \times 2 \times 2$ $=$ $=$

d) $5^2 =$ e) $1^7 =$ f) $4^2 =$
 $=$ $=$ $=$

g) $7^2 =$ h) $6^1 =$ i) $10^1 =$
 $=$ $=$ $=$

j) $3^3 =$ k) $7^1 =$ l) $9^2 =$
 $=$ $=$ $=$

m) $8^1 =$ n) $9^0 =$ o) $0^1 =$
 $=$ $=$ $=$



p) $4^1 =$ q) $1^{10} =$ r) $10^1 =$
 $=$ $=$ $=$

page 117 www.mathsmate.co.nz © Maths Mate 5.2/6.1 Skill Builder 11

3. Look up any unknown terms in the Skill Builder glossary

The glossary (pages 385 to 450) is more than just a list of definitions. It contains a wealth of relevant information that may help the students to better understand the question at hand. Weaker students may find that referring to a copy of the glossary, and even building on it, is a helpful strategy for improving their overall mathematical competency.

For example, a student might need to look up the word “index” before attempting to complete Skill 11.1

hundredths	• The <i>place value</i> between <i>tenths</i> and <i>thousandths</i> .	1825.763 has 6 hundredths.
hypotenuse	• The length of the side <i>opposite</i> the <i>right angle</i> of a <i>right-angled triangle</i> . • The longest side of a right-angled triangle.	
icosahedron	• A <i>regular solid</i> in which all twenty <i>faces</i> are <i>equilateral triangles</i> .	
identity element (for addition)	Rule: The <i>sum</i> of any number and zero equals that number. • Zero is the identity element for <i>addition</i> .	$a + 0 = a$ OR $0 + a = a$ $3 + 0 = 3$ OR $0 + 3 = 3$
identity element (for multiplication)	Rule: The <i>product</i> of any number and one equals that number. • One is the identity element for <i>addition</i> .	$a \times 1 = a$ OR $1 \times a = a$ $3 \times 1 = 3$ OR $1 \times 3 = 3$
improper fraction	• Any <i>fraction</i> in which the <i>numerator</i> is greater than or equal to the <i>denominator</i> .	$\frac{9}{8}$ the numerator is 9 the denominator is 8. $9 > 8$ so $\frac{9}{8}$ is an improper fraction.
increase	• To make larger or grow in size.	8 must increase by 5 to get to 13.
independent event	• An event that is totally unaffected by whether or not another event does or does not occur.	The toss of the first coin has no effect on the probability of the resulting head or tail on the second toss.
index	• • (pl. indices) A number placed to the upper right of a base number, showing how many times the base number is multiplied by itself. See <i>exponent</i> .	$7^4 = 7 \times 7 \times 7 \times 7 = 2401$ The index is 4. It is read as 'seven to the power of four'.
index notation	• Quantities in the form of a <i>base number</i> and an <i>index</i> . Index notation indicates what <i>power</i> is to be used and makes it easier to use <i>multiple factors</i> . See <i>exponential notation</i> .	$3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$ can be more easily written using index notation as 3^7 .
inequality	• See <i>inequation</i> .	

4. Complete the relevant Skill Builder

Work through the examples given for that skill, and complete the exercises.

There are many techniques or methods that can be used to teach the same basic skills, even something as simple as adding 7 and 9. It is good for a student to be given a range of alternatives appropriate for each skill but space restrictions make this impossible. These sheets often suggest an approach that may be different to a student's past experience. If a student feels more comfortable with his current technique, that is fine. In most cases it is the end result that counts.

It is possible to take a very weak student back to a Skill Builder from a lower level if this is necessary. It is also possible to use a higher level book for students to have further practice if required.

5. Correct the relevant Skill Builders from the Skill Builder answer sheets (from page 461)

6. Circle the completed skill numbers on the Maths Mate worksheet results sheet

NUMBER & ALGEBRA	8. [Integer \pm, \div]	8	9	10	11	12	8	9	10	11	12	8.1	8.2
	9. [Integer \times, \div]	9	9	9	9	9	9	9	9	9	9	9.1	9.2
	10. [Rates / Ratios]	10	10	10	10	10	10	10	10	10	10	10.1	10.2,3
	11. [Indices]	11	11	11	11	11	11	11	11	11	11	11.1	11.1
	12. [Square Roots]	12	12	12	12	12	12	12	12	12	12	12.1	12.2
	13. [Exploring Number]	13	13	13	13	13	13	13	13	13	13	13.1	13.2
	14. [Financial Mathematics]	14	14	14	14	14	14	14	14	14	14	14.1	14.2
	15. [Number Patterns]	15	15	15	15	15	15	15	15	15	15	15.1	15.2
	16. [Expressions]	16	16	16	16	16	16	16	16	16	16	16.1	16.1
	17. [Substitution]	17	17	17	17	17	17	17	17	17	17	17.1	17.2
18. [Expansion]	18	18	18	18	18	18	18	18	18	18	18.1	18.1	

7. Go back and repeat previous Maths Mate questions

After completing a Skill Builder, students should be encouraged to go back and attempt again those particular questions on the recently completed Maths Mate worksheets.

Dear Parents

As part of their Mathematics programme this year, all students have been given a weekly Maths Mate sheet.

The programme is now under way. The diagnostic nature of the worksheets helps students monitor their own progress. After they correct their worksheet and complete the record keeping sheet, over time, your child will be able to identify areas of strength and weakness in their mathematical learning.

If your child is having difficulty with a question for consecutive weeks or believes that their understanding is not at the level they would like, then Skill Builder sheets will be made available to develop each of the skills in the Maths Mate programme. Each Skill Builder focuses on and explores, one question from the Maths Mate sheets. Your child is encouraged to make full use of these resources by taking home any sheet that will help consolidate their understanding of a particular skill. Or, for your convenience, all worksheets are available on our website. Simply go to **www.mathsmate.co.nz** and follow the prompts to download the appropriate Skill Builder.

As each question in the Maths Mate is generally more difficult than the last, finishing with the problem solving questions, then it would be advised that, if students are concerned with more than one question, they tackle lower numbered questions first.

The Skill Builders may also help to motivate students to make another attempt at mastering skills that they have found too difficult in the past, given that it will become clear to them that they will be confronted by the same type of question on a regular basis.

While we will be monitoring your child's progress and supporting their skill development in the school environment, it would be appreciated if you would complete the tear off slip at the bottom of this page so that we can be sure that you are aware of our expectations regarding both the Maths Mate worksheets and the availability of Skill Builder worksheets. We ask also that you continue to sign the completed worksheets each week so that we can ensure each student is working independently and regularly but with your support.

We thank you in anticipation of your involvement and remind you that you are encouraged to call and discuss your child's progress at any time.

Yours sincerely

Class Teacher

Principal

Maths Mate Programme - Skill Builder Return Slip

Student's Name: Class:

As a parent / guardian I have signed this form to indicate that I am aware of the support Maths Mate Skill Builders can give my child in their mathematical development.

Parent's Signature: Date: