

How to use Maths Mate Skill Builder

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 is posing difficulty.

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

For skill builder help go to www.mathsmate.net

MATHS MATE Name: *John Keuneman*
 Class: *9J*
 Teacher: *Mr Jacques*

Worksheet Results

Term 1	Sheet 1	Sheet 2	Sheet 3	Sheet 4	Skill Builder title	Sheet 5	Sheet 6	Sheet 7	Sheet 8	Skill Builder title
1. [Long x,-]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	1.6
2. [Decimal +,-]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2.1
3. [Decimal x,-]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	3.2
4. [Fraction +,-]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4.1,2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4.1,2
5. [Fraction x,-]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5.2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5.5
6. [Percentages]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6.2
7. [Decimals / Fractions / Percents]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7.1,2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7.3
8. [Integer +,-]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8.2
9. [Integer x,-]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9.2
10. [Rates / Ratios]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	10.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	10.2
11. [Indices]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11.1
12. [Square Roots]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12.2
13. [Exploring Number]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13.2
14. [Applied Number]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	14.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	14.2
15. [Number Patterns]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15.2
16. [Expressions]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16.1
17. [Substitution]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	17.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	17.2
18. [Expansion]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	18.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	18.1
19. [Factorisation]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	19.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	19.1
20. [Equations]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	20.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	20.2
21. [Graphs & Functions]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	21.1,2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	21.3
22. [Units of Measurement / Time]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	22.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	22.2
23. [Perimeter / Area]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	23.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	23.5
24. [Surface Area / Volume]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	24.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	24.1,1
25. [Pythagoras]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	25.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	25.2
26. [Shapes]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	26.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	26.2
27. [Angles]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	27.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	27.2
28. [Exploring Geometry]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	28.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	28.2
29. [Statistics]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	29.5,6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	29.1,2,3
30. [Probability]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	30.1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	30.2
31. [Problem Solving 1]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	H & S	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	H & S
32. [Problem Solving 2]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	H & S	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	H & S
Total Correct	22	23	25	27						

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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 380). 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 Q10 and Q12 will need to build skills required for Q10 before they can improve Q12.

11. [Indices]

Skill 11.1: Expressing powers in index notation (base and exponent) of 10 to the power of 10.

Observe the exponent. The exponent tells you how many times to multiply it.

5 to the power of 5
 Base 5 Exponent

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

number to the power of 0 = 1 number to the power of 1 = itself $4^2 = 4 \times 4 = 16$ (4 squared) $2^3 = 2 \times 2 \times 2 = 8$ (2 cubed)

Q. $2^5 =$ A. $2^5 =$
 $= 2 \times 2 \times 2 \times 2 \times 2$
 $= 32$ (2 multiplied by itself 5 times)

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

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) $9^2 =$
 $=$ $=$ $=$

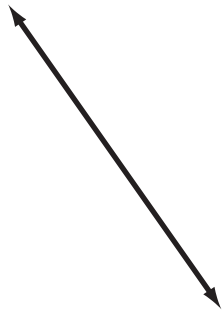
m) $8^1 =$ n) $9^0 =$ o) $0^1 =$
 $=$ $=$ $=$

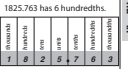
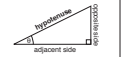

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3. Look up any unknown terms in the Skill Builder glossary

The glossary (pages 381 to 446) 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> .	$\frac{9}{2}$ is an improper fraction. the numerator is 9 the denominator is 8. $9 \geq 8$ so $\frac{9}{2}$ is an improper fraction.
increase	• To make larger or grow in size.	8 must increase by 5 to get to 13.
independent event	• An <i>event</i> 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</i> number and an <i>index</i> . Index notation indicates what <i>power</i> is to be used and makes it easier to use multiple <i>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

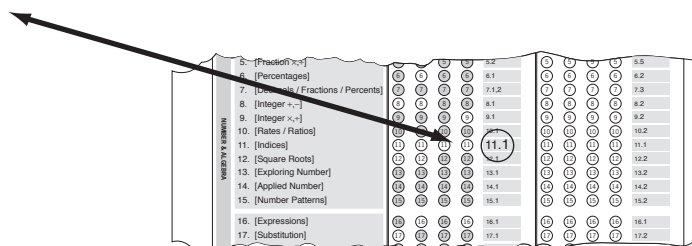
Work through the examples given for that skill, and complete the exercises.

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 457)

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



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.