

# How to use Math's Mate Skill Builder

## 1. Determine which Math's 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, provided at the start of each term in the Math's Mate Student Pad, then that question requires a Skill Builder.

For example, question 21 in Sheets 1, 2, 3 and 4 is not marked, so Skill 21.1 from Skill Builder 21 needs to be handed to the student.

Worksheet Results

Name: Paul Wright Class: 7B  
Teacher: Miss Bourke

Question	Sheet 1	Sheet 2	Sheet 3	Sheet 4	Sheet 5	Sheet 6	Sheet 7	Sheet 8
1. [- Whole Numbers to 10]	1	1	1	1	1	1	1	1
2. [- Whole Numbers to 10]	1	1	1	1	1	1	1	1
3. [- Whole Numbers to 12]	1	1	1	1	1	1	1	1
4. [- Whole Numbers to 12]	1	1	1	1	1	1	1	1
5. [Large Number +,-]	1	1	1	1	1	1	1	1
6. [Large Number +,-]	1	1	1	1	1	1	1	1
7. [Decimal +,-]	1	1	1	1	1	1	1	1
8. [Decimal ×,-]	1	1	1	1	1	1	1	1
9. [Fraction +,-]	1	1	1	1	1	1	1	1
10. [Fraction ×,-]	1	1	1	1	1	1	1	1
11. [Percents]	1	1	1	1	1	1	1	1
12. [Decimals / Fractions / Percents]	1	1	1	1	1	1	1	1
13. [Integers]	1	1	1	1	1	1	1	1
14. [Rates / Ratios]	1	1	1	1	1	1	1	1
15. [Exponents / Square Roots]	1	1	1	1	1	1	1	1
16. [Order of Operations]	1	1	1	1	1	1	1	1
17. [Ordering Number]	1	1	1	1	1	1	1	1
18. [Multiples / Factors / Primes]	1	1	1	1	1	1	1	1
19. [Number Patterns]	1	1	1	1	1	1	1	1
20. [Expressions]	1	1	1	1	1	1	1	1
21. [Substitution]	1	1	1	1	1	1	1	1
22. [Equations]	1	1	1	1	1	1	1	1
23. [Graphs & Functions]	1	1	1	1	1	1	1	1
24. [Shapes]	1	1	1	1	1	1	1	1
25. [Exploring Geometry]	1	1	1	1	1	1	1	1
26. [Units of Measurement / Time]	1	1	1	1	1	1	1	1
27. [Perimeters / Area / Volume]	1	1	1	1	1	1	1	1
28. [Area / Volume]	1	1	1	1	1	1	1	1
29. [Statistics]	1	1	1	1	1	1	1	1
30. [Probability]	1	1	1	1	1	1	1	1
31. [Problem Solving 1]	1	1	1	1	1	1	1	1
32. [Problem Solving 2]	1	1	1	1	1	1	1	1
33. [Problem Solving 3]	1	1	1	1	1	1	1	1
Total Correct	20	24	22	26				

## 2. Find the relevant Skill Builder on the Math's 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 316). 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.

Generally too, when a student has several areas of weakness, they should work on the lowest numbered question first. For example, a student struggling with Q1 and Q11 will need to build skills required for Q1 before they can improve Q11.

**21. [Substitution]**

Skill 21.1 Substitution: replace a value for a letter in an expression from letters + numbers

Use the letters with numbers.

Use the order of operations rule: Add (+) and/or subtract (-) from left to right.

Q. If  $a = 5$ , find the value of  $13 - a$

A.  $13 - a$  substitute  $a = 5$   
 $= 13 - 5$   
 $= 8$

a) If  $p = 2$ , find the value of  $5 + p$   
 $= 5 + 2 = 7$

b) If  $f = 3$ , find the value of  $6 + f$   
 $= \dots = \dots$

c) If  $c = 4$ , find the value of  $4 + c$   
 $= \dots = \dots$

d) If  $m = 5$ , find the value of  $m + 3$   
 $= \dots = \dots$

e) If  $g = 7$ , find the value of  $g + 2$   
 $= \dots = \dots$

f) If  $z = 6$ , find the value of  $z + 1$   
 $= \dots = \dots$

g) If  $x = 3$ , find the value of  $x + x$   
 $= \dots = \dots$

h) If  $v = 4$ , find the value of  $v + v$   
 $= \dots = \dots$

i) If  $q = 7$ , find the value of  $q + q$   
 $= \dots = \dots$

j) If  $t = 5$ , find the value of  $t + t + t$   
 $= \dots = \dots$

k) If  $e = 6$ , find the value of  $e + e + e$   
 $= \dots = \dots$

l) If  $p = 8$ , find the value of  $p + p + p$   
 $= \dots = \dots$

m) If  $j = 9$ , find the value of  $j + j - 8$   
 $= \dots = \dots$

n) If  $k = 7$ , find the value of  $k + k + 6$   
 $= \dots = \dots$

o) If  $h = 8$ , find the value of  $4 + h + h$   
 $= \dots = \dots$

p) If  $m = 8$ , find the value of  $m + m - 9$   
 $= \dots = \dots$

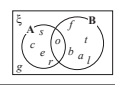
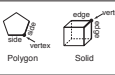
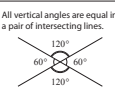
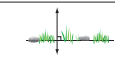
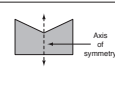
q) If  $s = 6$ , find the value of  $9 + s + s$   
 $= \dots = \dots$

r) If  $n = 5$ , find the value of  $8 + n + n$   
 $= \dots = \dots$

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

The glossary (pages 317 to 371) 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 “variable” before attempting to complete Skill 21.1

SK - UN	unlike terms	Opposite to like terms. $7, 6a$ and $-4y^3$ are unlike terms. $5w, \frac{6}{b}$ and $-18w^2$ are unlike terms.
	valid	• Grounded in logic or truth. If A causes B and B causes C, then it is valid to propose that A may cause C.
	variable	• A letter of the alphabet which stands in for a number. A variable takes the place of: an unknown value or a value which may change (vary) in different situations. Opposite to a constant. In $y = x + 5$ 5 is constant $x$ and $y$ are variables.
	Venn diagram	• A diagram using circles to show the relationship between sets of objects. 
	vertex	• (pl. vertices) The point at which two sides (of a polygon) or three edges (of a solid) meet. 
	vertical angles	• Angles on opposite sides of a pair of intersecting lines. • Vertical angles are congruent. 
	vertical line	• A line at right angle to the horizon. 
	vertical symmetry	• A shape has vertical symmetry if an axis of symmetry is vertical. 

### 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 383)

### 6. Circle the completed skill numbers on the Math's Mate worksheet results sheet

16. [Order of Operations]	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	16.10	16.11	16.12	16.13	16.14	16.15	16.16	16.17	16.18	16.19	16.20	16.21	16.22	16.23	16.24	16.25	16.26	16.27	16.28	16.29	16.30	16.31	16.32	16.33	16.34	16.35	16.36	16.37	16.38	16.39	16.40	16.41	16.42	16.43	16.44	16.45	16.46	16.47	16.48	16.49	16.50
17. [Exploring Number]	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	17.10	17.11	17.12	17.13	17.14	17.15	17.16	17.17	17.18	17.19	17.20	17.21	17.22	17.23	17.24	17.25	17.26	17.27	17.28	17.29	17.30	17.31	17.32	17.33	17.34	17.35	17.36	17.37	17.38	17.39	17.40	17.41	17.42	17.43	17.44	17.45	17.46	17.47	17.48	17.49	17.50
18. [Multiples / Factors / Primes]	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	18.10	18.11	18.12	18.13	18.14	18.15	18.16	18.17	18.18	18.19	18.20	18.21	18.22	18.23	18.24	18.25	18.26	18.27	18.28	18.29	18.30	18.31	18.32	18.33	18.34	18.35	18.36	18.37	18.38	18.39	18.40	18.41	18.42	18.43	18.44	18.45	18.46	18.47	18.48	18.49	18.50
19. [Number Patterns]	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	19.10	19.11	19.12	19.13	19.14	19.15	19.16	19.17	19.18	19.19	19.20	19.21	19.22	19.23	19.24	19.25	19.26	19.27	19.28	19.29	19.30	19.31	19.32	19.33	19.34	19.35	19.36	19.37	19.38	19.39	19.40	19.41	19.42	19.43	19.44	19.45	19.46	19.47	19.48	19.49	19.50
20. [Expressions]	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	20.10	20.11	20.12	20.13	20.14	20.15	20.16	20.17	20.18	20.19	20.20	20.21	20.22	20.23	20.24	20.25	20.26	20.27	20.28	20.29	20.30	20.31	20.32	20.33	20.34	20.35	20.36	20.37	20.38	20.39	20.40	20.41	20.42	20.43	20.44	20.45	20.46	20.47	20.48	20.49	20.50
21. [Substitution]	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	21.10	21.11	21.12	21.13	21.14	21.15	21.16	21.17	21.18	21.19	21.20	21.21	21.22	21.23	21.24	21.25	21.26	21.27	21.28	21.29	21.30	21.31	21.32	21.33	21.34	21.35	21.36	21.37	21.38	21.39	21.40	21.41	21.42	21.43	21.44	21.45	21.46	21.47	21.48	21.49	21.50
22. [Equations]	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	22.10	22.11	22.12	22.13	22.14	22.15	22.16	22.17	22.18	22.19	22.20	22.21	22.22	22.23	22.24	22.25	22.26	22.27	22.28	22.29	22.30	22.31	22.32	22.33	22.34	22.35	22.36	22.37	22.38	22.39	22.40	22.41	22.42	22.43	22.44	22.45	22.46	22.47	22.48	22.49	22.50
23. [Graphs & Functions]	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	23.10	23.11	23.12	23.13	23.14	23.15	23.16	23.17	23.18	23.19	23.20	23.21	23.22	23.23	23.24	23.25	23.26	23.27	23.28	23.29	23.30	23.31	23.32	23.33	23.34	23.35	23.36	23.37	23.38	23.39	23.40	23.41	23.42	23.43	23.44	23.45	23.46	23.47	23.48	23.49	23.50
24. [Shapes]	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	24.10	24.11	24.12	24.13	24.14	24.15	24.16	24.17	24.18	24.19	24.20	24.21	24.22	24.23	24.24	24.25	24.26	24.27	24.28	24.29	24.30	24.31	24.32	24.33	24.34	24.35	24.36	24.37	24.38	24.39	24.40	24.41	24.42	24.43	24.44	24.45	24.46	24.47	24.48	24.49	24.50
25. [Exploring Geometry]	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	25.10	25.11	25.12	25.13	25.14	25.15	25.16	25.17	25.18	25.19	25.20	25.21	25.22	25.23	25.24	25.25	25.26	25.27	25.28	25.29	25.30	25.31	25.32	25.33	25.34	25.35	25.36	25.37	25.38	25.39	25.40	25.41	25.42	25.43	25.44	25.45	25.46	25.47	25.48	25.49	25.50
26. [Units of Measurement / Time]	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	26.10	26.11	26.12	26.13	26.14	26.15	26.16	26.17	26.18	26.19	26.20	26.21	26.22	26.23	26.24	26.25	26.26	26.27	26.28	26.29	26.30	26.31	26.32	26.33	26.34	26.35	26.36	26.37	26.38	26.39	26.40	26.41	26.42	26.43	26.44	26.45	26.46	26.47	26.48	26.49	26.50
27. [Perimeter]	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	27.10	27.11	27.12	27.13	27.14	27.15	27.16	27.17	27.18	27.19	27.20	27.21	27.22	27.23	27.24	27.25	27.26	27.27	27.28	27.29	27.30	27.31	27.32	27.33	27.34	27.35	27.36	27.37	27.38	27.39	27.40	27.41	27.42	27.43	27.44	27.45	27.46	27.47	27.48	27.49	27.50
28. [Area / Volume]	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	28.10	28.11	28.12	28.13	28.14	28.15	28.16	28.17	28.18	28.19	28.20	28.21	28.22	28.23	28.24	28.25	28.26	28.27	28.28	28.29	28.30	28.31	28.32	28.33	28.34	28.35	28.36	28.37	28.38	28.39	28.40	28.41	28.42	28.43	28.44	28.45	28.46	28.47	28.48	28.49	28.50

### 7. Go back and repeat previous Math's Mate questions

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