


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 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 data builder help go to www.mathsmate.net

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Worksheet Results

Term 1	Skill Builder 11				Skill Builder 12				Skill Builder 13			
	Sheet 1	Sheet 2	Sheet 3	Sheet 4	Sheet 5	Sheet 6	Sheet 7	Sheet 8	Sheet 9	Sheet 10	Sheet 11	Sheet 12
1. [Long \times -]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. [Decimal \times -]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. [Decimal \div -]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. [Fraction \times -]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. [Fraction \div -]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. [Percents]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. [Decimals / Fractions / Percents]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. [Integers]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. [Tables / Patterns]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. [Exponents]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. [Square Roots]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. [Exploring Number]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. [Number Patterns]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. [Expressions]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. [Substitution]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. [Expansion]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. [Factorization]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. [Equations]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. [Graphs & Functions]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. [Shapes]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. [Angles]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. [Exploring Geometry]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. [Units of Measurement / Time]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. [Perimeter]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. [Area]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. [Surface Area]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. [Volume]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. [Pythagorean Theorem]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. [Statistics]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. [Probability]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. [Problem Solving 1]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. [Problem Solving 2]	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Total Correct	22	23	25	27								

page 1 © Math's Mate Mauve - Record Keeping Sheets

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 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.

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.

11. [Square Roots]

Skill 11.1 **11.1** **11.2** **11.3** **11.4** **11.5** **11.6** **11.7** **11.8** **11.9** **11.10** **11.11** **11.12** **11.13** **11.14** **11.15** **11.16** **11.17** **11.18** **11.19** **11.20** **11.21** **11.22** **11.23** **11.24** **11.25** **11.26** **11.27** **11.28** **11.29** **11.30** **11.31** **11.32** **11.33** **11.34** **11.35** **11.36** **11.37** **11.38** **11.39** **11.40** **11.41** **11.42** **11.43** **11.44** **11.45** **11.46** **11.47** **11.48** **11.49** **11.50** **11.51** **11.52** **11.53** **11.54** **11.55** **11.56** **11.57** **11.58** **11.59** **11.60** **11.61** **11.62** **11.63** **11.64** **11.65** **11.66** **11.67** **11.68** **11.69** **11.70** **11.71** **11.72** **11.73** **11.74** **11.75** **11.76** **11.77** **11.78** **11.79** **11.80** **11.81** **11.82** **11.83** **11.84** **11.85** **11.86** **11.87** **11.88** **11.89** **11.90** **11.91** **11.92** **11.93** **11.94** **11.95** **11.96** **11.97** **11.98** **11.99** **11.100**

Check which number, multiplied by itself, produces the number under the square root sign.
Check your estimation by multiplying your guess by itself.
Hint: Calculating the square root is the opposite to squaring.

o. $\sqrt{400} =$ $\sqrt{400} =$
 $= \sqrt{20 \times 20}$
 $= 20$

a) $\sqrt{25} =$ $\sqrt{4} =$ $\sqrt{81} =$
 $= \sqrt{5 \times 5} = 5 =$ $=$ $=$ $=$ $=$

d) $\sqrt{100} =$ $\sqrt{64} =$ $\sqrt{169} =$
 $=$ $=$ $=$ $=$ $=$ $=$ $=$ $=$

g) $\sqrt{121} =$ $\sqrt{1} =$ $\sqrt{600} =$
 $=$ $=$ $=$ $=$ $=$ $=$ $=$ $=$

j) $\sqrt{9} =$ $\sqrt{144} =$ $\sqrt{6400} =$
 $=$ $=$ $=$ $=$ $=$ $=$ $=$ $=$

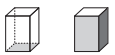



m) $\sqrt{256} =$ $\sqrt{225} =$ $\sqrt{10,000} =$
 $=$ $=$ $=$ $=$ $=$ $=$ $=$ $=$

page 123 www.mathsmate.net © Math's Mate Mauve/Lime 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 term “square root of a number” before attempting to complete Skill 11.1

square prism	• A <i>three-dimensional</i> shape. Two identical square <i>bases</i> . All the other faces <i>rectangles</i> .		13 - 136
square pyramid	• A <i>three-dimensional</i> shape. One square <i>base</i> . All the other faces are <i>triangles</i> .		
square yard (yd²)	• A <i>unit of area</i> equal to 1 yard by 1 yard.		
square root of a number ($\sqrt{\quad}$)	• A <i>number</i> which, when <i>multiplied</i> by itself, gives the original number. Finding the square root of a number is the <i>inverse operation</i> of squaring that number.	$\sqrt{900} = 30$ Square root of 900 is 30, because $30 \times 30 = 900$ or $30^2 = 900$	
square units	• A <i>unit of area</i> equal to the area of a square with side lengths of 1 unit.	$A = lw$ $= 3 \times 2$ $= 6$ Area = 6 square units	
squared	• Multiplied by itself. A number raised to the second <i>power</i> .	4 squared is written as 4^2 $4^2 = 4 \times 4 = 16$	
standard form	• Numbers written in their <i>simplest form</i> . They do not contain exponents. • <i>Whole numbers</i> and <i>decimal</i> numbers are numbers in standard form. • <i>Fractions, percents, powers, square roots</i> , etc. are not in standard form because an <i>operation</i> can be performed to <i>simplify</i> them.	9000 and 1.008 are in standard form. $\frac{5}{10}$, 35%, 7^4 and $\sqrt{12}$ are not in standard form.	
statistics	• Numerical facts systematically collected, organized and analyzed.	Data is collected from a sample of the population, organized into a graph and interpreted to summarize some characteristic.	

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 463)

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

Skill Builder Number	5. [Fraction \times, \div]	5.1	5.5
	6. [Percents]	6.1	6.2
	7. [Decimals / Fractions / Percents]	7.1, 2	7.3
	8. [Integers]	8.1	8.2
	9. [Rates / Ratios]	9.1	9.2
	10. [Exponents]	10.1, 2	10.3
	11. [Square Roots]	11.1	11.2
	12. [Exploring Number]	12.1, 2	12.2
	13. [Number Patterns]	13.1	13.2
	14. [Expressions]	14.1	14.1
	15. [Substitution]	15.1	15.2

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.