

# UNIT 11 *Algebraic Manipulation*

# Teaching Notes

## *Historical Background and Introduction*

By this stage pupils should be able to use algebraic notation and manipulation with confidence! In this unit we first recap the ideas of

*equations, formulae and identities*

before considering the dual concepts of

*brackets and factorisation.*

We return to the use of formulae in the final section.

Throughout, it is most important that pupils understand that algebra is a completely logical subject, based on a precise notation and clearcut rules for manipulation. There is never any doubt or 'maybe', just distinct and logical methods. For some pupils, revision in notation and in 'balancing' the sides of equations may be necessary.

### *Routes*

	<b>Standard</b>	<b>Academic</b>	<b>Express</b>
11.1 Equations, Formulae and Identities	✓	✓	(✓)
11.2 Simplifying Expressions	(✓)	✓	✓
11.3 Factorising	×	✓	✓
11.4 Using Formulae	×	✓	✓

### *Language*

	<b>Standard</b>	<b>Academic</b>	<b>Express</b>
Identity	✓	✓	✓

### *Misconceptions*

Some of the basic misconceptions include:

- confusion between the meaning of  $x^2$  ( $= x \times x$ ) and  $2x$  ( $= 2 \times x$ )
- $(3x)^2 = 9x^2$  (correct), not  $9x$  (incorrect)
- $2(x + 3) = 2x + 6$  (correct), not  $2x + 3$  (incorrect)
- $(a + b)^2 = a^2 + 2ab + b^2$  (correct), not  $a^2 + b^2$
- $-4(x - 2) = -4x + 8$  (correct), not  $-4x - 8$  (incorrect)

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## *Challenging Questions*

The following questions are more challenging than others in the same section:

	<i>Section</i>	<i>Question No.</i>	<i>Page</i>
<i>Practice Book Y9B</i>	11.1	10	60
" "	11.1	13	63
" "	11.2	16	70
" "	11.3	9, 10	74
" "	11.4	12	78
" "	11.4	14	80