Maths
Higher Level Algebra

It is not necessary to carry out all the activities contained in this unit. **Please see *Teachers' Notes* for explanations, additional activities, and tips and suggestions.**

Theme	Higher Level Algebra	
All students: Activities that are suitable for **Learning Support, Language Support** and the **Mainstream Subject Class** include:	Keywords	3
	Vocabulary File	4-5
	Completing Sentences	11
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	Wordsearch	15
Learning support and Language support: Activities suitable for students receiving Learning or Language Support include:	Working with words	6
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	Alphaboxes	14
	Play Snap	16-19
Language support: Additional activities for Language Support:	Grammar points	13
Levels for Language Support	**A1 – B1** The language level of each activity is indicated in an information box.	
Learning focus	Using Maths textbooks and accessing curriculum content and learning activities.	
Acknowledgement	The *English Language Support Programme* acknowledges the permission of Gill and Macmillan to reproduce excerpts from *Shortcuts to Success. Maths. Junior Certificate Ordinary Level* by Mark Halpin.	

Note: *The categorisation of activities is indicative only and should not prevent teachers from using any activities that are considered suitable for a particular group of students.*

Making the best use of these units

Learning Record

A copy of the Learning Record should be distributed to each learning support and language support student.

Students should:

1. Write the subject and topic on the record.
2. Tick off/date the different statements as they complete activities.
3. Keep the record in their files along with the work produced for this unit.
4. Use this material to support mainstream subject learning.

Introduction of a topic or activity should ensure that students understand **what** they are doing and **why**. Many students will have some difficulty in understanding both the language in the activity and the instructions/purpose for carrying out the activity.

You can create your **personal teaching resource** by printing these units in full and filing them by subject in a large ring binder.

Encourage students to:

- ○ Bring the relevant **subject textbooks** to learning/language support class. It does not matter if they have different textbooks as the activities in these units refer to vocabulary and other items that will be found in all subject textbooks. These units are based on curriculum materials.
- ○ Take some **responsibility for their own learning** programmes by:

 Developing a **personal dictionary** for different subjects, topics, and other categories of language, on an on-going basis. This prompt is a reminder.
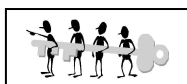
 Recording what they have learnt on the *Learning Record,* which should be distributed at the start of each unit.

 Keeping their own **files** with good examples of the work produced for different subjects and topics. This file will be an invaluable **learning resource** in supporting mainstream learning.

 Indicates that answers may be found at the end of the unit.

Don't forget that many of the activities in these units are also suitable as **homework** tasks or for **self-study.**

Keywords

The list of keywords for this unit is as follows:

Nouns
algebra
bracket
cost
denominator
equation
factor
fraction
information
item
newsagent
number
result
sign
single equation
square
term
type

Verbs
to add
to calculate
to change
to divide
to evaluate
to factorise
to get a result
to illustrate
to inform
to let
to multiply
to rearrange
to remember
to simplify

to solve
to write

Adjectives
common
correct
correctly
decimal
each
only *(adjective)*
quadratic
single

Adverb
always
once
only *(adverb)*
twice
when

Other
hence = so = therefore
more than
otherwise
in x = one unknown value
in x and y = two unknown values

Symbols
= equals
c cent/cents
x^2 is x square/x squared

Vocabulary file 1

Word	Meaning	Note or example*
X		
algebra		
factorise		
number		
term		
multiply		
write		

*You may wish to write a sentence or phrase, make a note of the page in your textbook where this word appears or, if English is not your first language, provide a translation into your language.

Get your teacher to check this and then file it in your folder so you can use it in the future.

Vocabulary file 2

Word	Meaning	Note or example
equation		
to illustrate		
quadratic		
hence		
to simplify		
factor		
square		

Get your teacher to check this and then file it in your folder so you can use it in the future.

MATHS: Higher Level Algebra

Language Level: A1
Type of activity: pairs or individual
Suggested time: 10 minutes

Working with words

1. Tick the correct answer

a) this is geometry
b) this is a fraction

c) this is a percentage
d) this is algebra

a) this is geometry
b) this is a fraction

c) this is a percentage
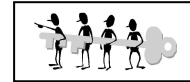d) this is algebra

2. Tick the best answer. $x + 8 = 12$. What does **x** stand for?

    a. 8
    b. 12
    c. 4

3. Tick the best answer. The words <u>stand</u> <u>for</u> mean:

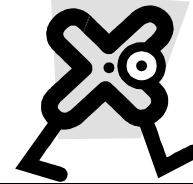   a. to stand up
    b. to represent
    c. to fight for

Language Level: A1
Type of activity: pairs or individual
Suggested time: 30 minutes

Picture Sentences

1. Tick the correct answer

a) This is a multiplication.
b) This is division.
c) This is subtraction.
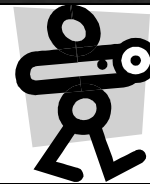

a) This is a multiplication.
b) This is division.
c) This is subtraction.
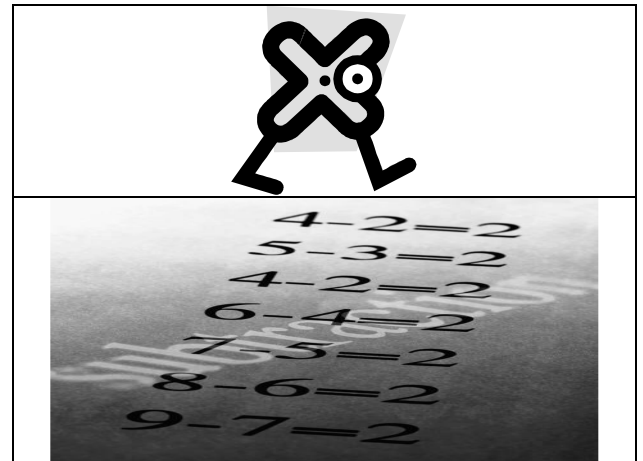
a) This is a multiplication.
b) This is division.
c) This is subtraction.

.

2. Put these words in the correct order to form <u>instructions</u>.

consider problem the

_____

numbers letters for substitute

_____

add subtract and terms like

_____

Language Level: A1 / A2
Type of activity: pairs or individual
Suggested time: 20 minutes

Odd One Out

1. Circle the word which does not fit with the other words in each line.

Example: *apple*   *orange*   *banana*   (*taxi*)

geometry	algebra	cat	maths
divide	speak	multiply	subtract
a quarter	one	a third	a half
solve	find	remember	fraction

2. Find these words in your textbook. Then put them in short sentences in your own words. Use a dictionary if necessary.

to stand for _____

to substitute   _____

to remove   _____

to simplify   _____

to consider   _____

Check that these key words are in your personal dictionary.

Language Level: A2 / B1
Type of activity: individual
Suggested time: 20 minutes

Maths Keywords

1. Fill in the missing letters of the keywords listed below.
On the line next to the keywords, write down whether this word is a noun, an adjective or a verb.
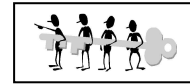
fac_ _ri_e   _____

qua_ _at_c   _____

equ_ _ion   _____

fa_ _ors   _____

2. Write as many words as possible related to **algebra / this unit**. You have 3 minutes!

_____

_____

_____

_____

_____

_____

Language Level: A1 / A2
Type of activity: pairs or individual
Suggested time: 20 minutes

Unscramble the letters

1.   When you organise things more than once   ARANERERG

       Answer _____

2.   Another way of saying that something is right   RCOTERC

       Answer _____

3.   Two Maths phrases that are equal   QEANTIUO

       Answer _____

4.   The part of Maths where letters and symbols are used to represent numbers   GABLRAE

       Answer _____

Solve the secret code
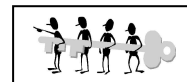
English=	A	B	E	F	G	I	L	N	R	S	U
Code=	C	X	Y	H	J	Q	K	O	M	P	W

example: (code) JQMK = GIRL (English)

CKJYXMC QP HWO! =

_____

MATHS: Higher Level Algebra

Language Level: A2/B1
Type of activity: pairs or individual
Suggested time: 30 minutes

Completing sentences

The sentences on this page are all instructions from your textbooks. Fill in the blanks in these sentences. Use words from the Word Box below.

1.   Write each of the following without using the _____ sign.

2.   _____ each of the following by adding like terms.

3.   Find the _____ (length all round) of each of the following figures.

4.   Remove the _____ in each of the following.

5.   _____ each of the following as a single term to a power.

6.   _____ the brackets and simplify each of the following.

7.   _____ each of the following.

8.   Multiply out and simplify _____ of these.

9.   If x = 2 and y= 4, find the _____ of:

10.   _____ out the length of this perimeter when a=9 and b=3.

Word Box

work multiply	brackets	simplify	write	multiplication
	perimeter	remove	each	value

Language Level: A2 / B1
Type of activity: individual
Suggested time: 30 minutes
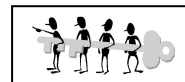
Multiple choice

Read the text below and choose the best answers.
Question 2
(a) In a newsagent:

       2 pens and 3 rulers cost 85c.

       3 pens and 4 rulers cost €1.20.

Write two equations, in x and y, to illustrate the above information. Hence, calculate the cost of each item.
(b) Simplify $3x^2 - 4x - 4$

          $9x^2 - 4$
(c) Solve for x: $-2(4x - 1) + 2 = 3(-2x + 1)$

Question 3
(a) Factorise each of the following:

      (i) $3ax + 6xb - 2ay - 4by$

      (ii) $4x2 - 25y2$
(b) Solve for a and b:

      $3a + 2b = 16$

      $4a - 3b = -7$
(c) When twice the square of a number is added to nine times the number, the result is five. Letting the number = x, write a single equation in x, and hence evaluate x.

1. Along with rulers, what is sold in the newsagent?
    a)   pencils   b)   pencil cases
    c)   pens   d)   paper

2. How many equations are you asked to write in Question 2 (a)?
    a)   none   b)   two
    c)   one   d)   twelve

3. What should you solve Question 3 (b) for?
    a)   a and b   b)   b and c
    c)   b and d   d)   nothing

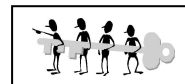4. In Question 3 (c), should you let the number = y?
    a.   Yes   b.   No

5. Should you evaluate x in Question 3 (c)?
    a)   Yes   b)   No

Language Level: B1
Type of activity: individual and pairs
Suggested time: 30 minutes

Grammar points

1. Verb Hunt

Circle the 10 verbs in these lists. Score 4 points for each correct answer. Who will score the highest? Perhaps you will. Good luck!

substitute	algebra	solve
geometry	divide	equation
multiplication	simplify	only
consider	remove	change
division	addition	write
correctly	false	introduce
correct	true	perimeter

Score: _____ points

2. Verbs and nouns

Change all the verbs into nouns. Careful, some of them are tricky! Check with another student before looking at your dictionary.

multiply → multiplication   remove →

divide   →   correct →

simplify →   change →

consider →   arrange →

subtract →   substitute→

Alphaboxes

Using your textbook, find **one** word beginning with each of the letters of the alphabet. Write the word in the relevant box. You could also write the word in your own language**.**

a	b	c
d	e	f
g	h	i
j	k	l
m	n	o
p	q	r
s	t	u
v	w	xyz

Do you understand all these words?

Get your teacher to check this, then file it in your folder so you can use it in the future.

MATHS: Higher Level Algebra

Word Search

Find the words in the box below.

```
                        P  P
                        R  M
                  U  H  S  R
                  F  E  W  B
            P  R  O  F  I  T
            F  A  C  T  O  R
X  K  I  L  O  M  E  T  R  E  M  U  L  T  I  P  L  Y  D  B
S  I  G  N  Q  U  A  D  R  A  T  I  C  C  O  R  R  E  C  T
   J  Z  T  K  C  P  E  R  C  E  N  T  A  G  E  H  S  E
      F  A  C  T  O  R  I  S  E  W  R  I  T  E  F  N
         Q  N  X  S  R  E  A  R  R  A  N  G  E  N
            B  D  D  E  X  A  M  P  L  E  B  W
         H  E  N  C  E  I  N  C  O  M  E  Q  O  C
         I  R  R  Z  I  N  T  E  R  E  S  T  K  K
      A  M  O  U  N  T  E  Q  U  A  T  I  O  N  M  M
      N  U  M  B  E  R  V        T  C  U  T  O  F  F
   C  R  E  D  I  T  S           U  C  O  S  T  S  P
   S  P  E  E  D                    P  R  I  C  E
W  F  X  Y                             A  I  N  E
N  I                                   Q  E
```

AMOUNT	EXAMPLE	KILOMETRE	QUADRATIC
CORRECT	FACTOR	MULTIPLY	REARRANGE
COSTS	FACTORISE	NUMBER	SIGN
CREDITS	HENCE	PERCENTAGE	SPEED
CUTOFF	INCOME	PRICE	WRITE
EQUATION	INTEREST	PROFIT	

Play Snap:

Make Snap cards with 2 sets of the same keywords. See *Notes for teachers* for ideas about how to use the cards.

✂

equation	**equation**
factors	**factors**
quadratic	**quadratic**

algebra	**algebra**
correct	**correct**
number	**number**

solve

solve

rearrange

rearrange

multiply

multiply

MATHS: Higher Level Algebra

hence	hence
sign	sign
term	term

Answer key

Working with words, page 6
1. d, a
2. c
3. b

Picture sentences, page 7
1. a, c, b
2. Consider the problem.
Substitute letters for numbers. Or. Substitute numbers for letters.
Add and subtract like terms.

Odd One Out, page 8
Cat, speak, one, fraction

Maths key words, page 9
factorise (verb), quadratic (adjective), equation (noun), factors (noun)

Unscramble the letters, page 10
Rearrange, correct, equation, algebra
Secret Code: algebra is fun

Completing Sentences, page 11
Write each of the following without using the **multiplication** sign.

Simplify each of the following by adding like terms.

Find the **perimeter** (length all round) of each of the following figures.

Remove the **brackets** in each of the following.

Write each of the following as a single term to a power.

Remove the brackets and simplify each of the following.

Multiply each of the following.

Multiply out and simplify **each** of these.

If x = 2 and y= 4, find the **value** of:

Work out the length of this perimeter when a=9 and b=3.

Multiple choice, page 12

1c, 2b, 3a, 4b, 5a

Grammar points, page 13
1. Verbs: substitute, consider, correct, divide, simplify, remove, solve, change, write, introduce
2. Verbs and nouns   remove   → removal

    divide   →   division   correct →   correction

    simplify →   simplification   change → change

    consider →   consideration   arrange → arrangement

    subtract →   subtraction   substitute→ substitution

Word Search

```
                        P  P
                        R  M
                     U  H  S  R
                     F  E  W  B
                  P  R  O  F  I  T
                  F  A  C  T  O  R
   X  K  I  L  O  M  E  T  R  E  M  U  L  T  I  P  L  Y  D  B
   S  I  G  N  Q  U  A  D  R  A  T  I  C  C  O  R  R  E  C  T
      J  Z  T  K  C  P  E  R  C  E  N  T  A  G  E  H  S  E
         F  A  C  T  O  R  I  S  E  W  R  I  T  E  F  N
            Q  N  X  S  R  E  A  R  R  A  N  G  E  N
               B  D  D  E  X  A  M  P  L  E  B  W
            H  E  N  C  E  I  N  C  O  M  E  Q  O  C
               I  R  R  Z  I  N  T  E  R  E  S  T  K  K
            A  M  O  U  N  T  E  Q  U  A  T  I  O  N  M  M
               N  U  M  B  E  R  V        T  C  U  T  O  F  F
            C  R  E  D  I  T  S              U  C  O  S  T  S  P
            S  P  E  E  D                       P  R  I  C  E
         W  F  X  Y                                A  I  N  E
         N  I                                      Q  E
```