Maths

Higher Level Graphing inequalities

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 Graphing inequalities**	
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**
	Multiple Choice	**12**
	Wordsearch	**15**
Learning support and Language support: Activities suitable for students receiving Learning or Language Support include:	**Working with words**	**6**
	Picture Sentences	**7**
	Odd One Out	**8**
	Maths Keywords	**9**
	Unscramble the letters	**10**
	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 Higher 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
answer
calculator
decimal place
decimal point
decimals
denominator
direction
equation
error
estimation
example
fraction
inequality/inequalities
LCM (Lowest Common Multiple)
line
multiple *(noun)*
notation
number line
number/numbers (no/nos)
numerator
problem
questions
real numbers
shaded line
type
value
whole numbers

Verbs
to add
to change
to complete
to evaluate
to find
to graph
to include
to multiply
to rewrite
to shade
to show
to simplify
to solve
to subtract
to use

must

Adjectives
appropriate
both
common
correct
decimal
exact
exactly
important
lowest
multiple (adjective)
negative
normal
positive
real
shaded
whole

Adverb
always
when

Other
hence = so = therefore
both sides
the same manner
the same way

Symbols
= equals
+ plus
≤ less than or equal to
< less than
≥ greater than or equal to
> greater than
→ goes to

Vocabulary file 1

Word	Meaning	Note or example*
inequalities		
line		
complete		
rewrite		
simplify		
negative		
numbers		

*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.

Check that these key words are in your personal dictionary.

Vocabulary file 2

Word	Meaning	Note or example
denominator		
shaded		
whole		
type		
value		
graph		
subtract		

Check that these key words are in your personal dictionary.

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MATHS: Higher Level Graphing inequalities

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***

numbers	bread	real	fractions
denominators	green	common	lowest
add	subtract	multiply	eat
leaves	negative	positive	fractions

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

to complete _____

to evaluate _____

to graph _____

to solve _____

to rewrite _____

Check that these key words are in your personal dictionary.

NAME: _____ DATE:_____

MATHS: Higher Level Graphing inequalities

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.

ne_ _ti_e _____

su_ _ra_t _____

ine_ _alit_es _____

fra_ _i_ns _____

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

_____

_____

_____

_____

_____

NAME: _____ DATE:_____

MATHS: Higher Level Graphing inequalities

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

Unscramble the letters

1. When a number in Maths is greater than zero STOVIIPE

Answer _____

2. Numbers that are not of the same value LIUAEINTIQES

Answer _____

3. A part of a number NACFIRTO

Answer _____

4. Take one number away from another number BSCUTRAT

Answer _____

Solve the secret code

English=	A	C	E	F	I	N	O	R	S	T	U
Code=	B	X	Y	J	G	Q	P	D	L	K	W

example: (code) JGDLK = FIRST (English)

JDBXKGPQL BDY JWQ =

_____

NAME: _____ DATE:_____

MATHS: Higher Level Graphing inequalities

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

Multiple choice

Read the text below and choose the best answers.

SOLVING INEQUALITIES

Inequalities are solved in exactly the same way as normal equations except:

Important

When the x term is negative we must:

1. Change the sign on both sides of the inequality.
2. Change the direction of the inequality.

Example: $-3x \leq 6$, **so** $3x \geq -6$, **so** $x \geq -2$

Example 1

Solve $2(x + 1) \leq 10$, $x \in N$ and graph on the appropriate number line.

$2(x + 1) \leq 10$
$2x + 2 \leq 10$
$2x \leq 10 - 2$
$2x \leq 8$
$x \leq 4$

1. Are inequalities solved the same way as normal equations?

a) yes, except when x is negative b) yes, always
c) no d) only in the summer

2. What should you do if x is negative?

a) wash your hands b) change the sign on one side
c) rub your eyes d) change the sign on both sides

3. What should you do in example 1?

a) nothing b) multiply the equation
c) solve the equation d) subtract

4. Should you change the direction of an inequality when x is negative?

a) Yes b) No

5. Should you graph the equation on the appropriate number line?

a) Yes b) No

NAME: _____ DATE:_____

MATHS: Higher Level Graphing inequalities

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

Grammar points

Much many

1. Look at the two questions taken fro your textbook:

An oil tank is $\frac{3}{4}$ full and holds 896 litres.
How many litres can the tank hold?

Alan spend $\frac{7}{8}$ of his money. If he had €100 left, how much money had he at first?

Why did we say **how <u>many</u> litres?** but **how <u>much</u> money?**

Discuss your answer with your teacher and other students. You can check your answer in the Answer key.

2. Look at the following pairs of words and divide them into two lists:

<u>How much?</u> <u>How many?</u>

pills/medicine

bread/potatoes

work/jobs

time/hours

five euro notes/money

minutes/time

problems/trouble

information/facts

reports/news

chairs/furniture

kisses/love

Grammar points

Much/many continued.

3. The following are questions from your textbooks, complete with the word much or many.

- How _____ pupils live less than 6km from the school?
- How _____tablets should be put into the bottle so that the weight would be ⅔of the total weight?
- Anne spent ⅝ of her money and had €16.40 left. How _____ had she at first?
- How _____ 1¼ litre cartons of orange juice can be filled from a container holding 40 litres?
- Emer ought a three hour blank tape. She recorded ¾ of an hour and ⅔ of an hour on the tape. How _____ time was left?

4. Now it's your turn! Go to your maths textbook. Find 5 examples of questions with **how much** or **how many**. Rewrite the sentences with blanks instead of much/many. Swap your sentences with another student's and fill in one another's sentences.

5. Imagine your class or your family is going on a trip – a camping expedition. Make a list of all everything you need to bring with you (it will be more fun if you do this in pairs or small groups). There must be at least 12 items on your list! Show you list to other students. For each item on the list he or she must ask **how much?** or **how many?** of each item you are to bring.

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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

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MATHS: Higher Level Graphing inequalities

Word Search

Find the words in the box below.

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

ADD	FIND	LOWEST	REAL
COMMON	FRACTIONS	MULTIPLE	REWRITE
COMPLETE	GRAPH	MULTIPLY	SIMPLIFY
DECIMAL	INEQUALITIES	NEGATIVE	SOLVE
DENOMINATORS	LCM	NUMBERS	SUBTRACT
EVALUATE	LINES	POSITIVE	

Play Snap

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

✂

fraction	**fraction**
decimal	**decimal**
simplify	**simplify**

NAME: _____ DATE:_____
MATHS: Higher Level Graphing inequalities

real	real
rewrite	rewrite
complete	complete

negative	negative
numbers	numbers
lowest	lowest

multiple	multiple
positive	positive
add	add

Answer key

Odd One Out, page 6
Bread, green, eat, leaves

Maths key words, page 7
negative (adjective), subtract (verb), inequalities (noun), fractions (noun)

Unscramble the letters, page 8
Received, profit, telephone, prepare
Secret Code: overheads are expensive

Multiple choice, page 9
1a,2d,3c,4a,5a

Grammar points, page 13
1. We use **many** with a **countable** noun (a noun that can have a/an before it and can be used both in the singular and plural).
We use **much** with an **uncountable** noun (a noun that cannot have a/an before it and cannot be used in the plural).
2. How much medicine, bread, work, time, money, time, trouble, information, news, furniture, love.
How many pills, potatoes, jobs, hours, five euro notes, minutes, problems, facts, reports, chairs, kisses.

Grammar points, page 14

- How **many** pupils live less than 6km from the school?
- How **many** tablets should be put into the bottle so that the weight would be ⅔of the total weight?
- Anne spent ⅝ of her money and had €16.40 left. How **much** had she at first?
- How **many** 1¼ litre cartons of orange juice can be filled from a container holding 40 litres?
- Emer ought a three hour blank tape. She recorded ¾ of an hour and ⅔ of an hour on the tape. How **much** time was left?

Word Search:

NAME: _____ DATE:_____

MATHS: Higher Level Graphing inequalities