Maths

Coordinate geometry

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	**Coordinate geometry**
Levels	**A1 – B1**
Language focus	Key vocabulary, word identification, sentence structure, extracting information from text, grammar.
Learning focus	Using Maths textbooks and accessing curriculum content and learning activities.
Activity types	Matching, word identification, structuring sentences and text, cloze, multiple choice, reading comprehension, categorising vocabulary, recording learning, developing a learning resource.
Acknowledgement	**Extracts from *Shortcuts to Success. Maths. Junior Certificate Ordinary Level*. Mark Halpin.** Gill & Macmillan. We gratefully acknowledge Gill & Macmillan for the right to reproduce text in some of these activities.
Learning Record	A copy of the Learning Record should be distributed to each 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.

Making the best use of these units

- **At the beginning of the class,** make sure that students understand **what** they are doing and **why**. *'We are doing the exercise on page (12) to help you to remember key words / to help your writing skills / to help with grammar'* etc.

- 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:

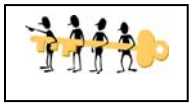
  - Bring the relevant **subject textbooks** to language support class. It does not matter if they have different textbooks as the activities in these units refer to vocabulary and other items that will be found in all subject textbooks. These units are based on curriculum materials.
  - Take some **responsibility 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 in language support for different subjects and topics. This file will be an invaluable **learning resource** in supporting mainstream learning.

- Don't forget that many of the activities in these units are suitable as **homework** tasks, for **self-study,** or for use in the **subject classroom** with the agreement of the subject teacher.



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

Keywords

The list of keywords for this unit is as follows:

Nouns
area
axis
coordinates
distance
equation
formula
geometry
line
midpoint
origin
point

Verbs
to construct
to cut
to draw
to evaluate
to extend
to find
to form
to give
to intersect
to join
to let
to measure
to plot
to prove
to show

Adjectives
constructed
end
equal
given
intersecting
measured
middle
opposite
perpendicular
sample
straight
vertical

Other
from
vertically

Symbols
|ab| length from point a to point b
∠**abc** angle formed as you move from point a to point b to point c
70^0 70 degrees

NAME: _____ DATE:_____

MATHS: Coordinate geometry

Vocabulary file 1

This activity may be done in language support class or in the mainstream subject classroom.

Word	Meaning	Word in my language
area		
axis		
coordinates		
equation		
formula		
origin		

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

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MATHS: Coordinate geometry

Vocabulary file 2

This activity may be done in language support class or in the mainstream subject classroom.

Word	Meaning	Word in my language
measured		
opposite		
perpendicular		
sample		
straight		
vertical		

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

NAME: _____ **DATE:**_____

MATHS: Coordinate geometry

Level: A1/A2 **Type of activity:** pairs or individual	**Focus:** vocabulary **Suggested time:** 20 minutes

Working with words

1. How do you <u>say</u> these equations? Tick the correct answer

$$\frac{Y_2 - Y_1}{X_2 - X_1}$$

- ☐ a) y two minus y one over x two minus x one
- ☐ b) y squared minus y on top of x squared minus x
- ☐ c) x squared minus x underneath y squared minus y
- ☐ d) x squared minus x on the line below y square minus y

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

- ☐ a) x squared minus x plus y squared minus y squared
- ☐ b) the square root of x squared minus x plus y squared minus y
- ☐ c) the square root of x two minus x one, squared, plus y two minus y one, squared
- ☐ d) x minus x plus y minus y , squared

2. Now practise saying the following equations: (Note, you <u>pause</u> when you see a comma)

$$y = \frac{1}{2}x - 1$$

$$y = -2x - 1$$

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

NAME: _____ DATE:_____

MATHS: Coordinate geometry

Level: A1/A2
Type of activity: pairs or individual

Focus: vocabulary, basic sentence structure
Suggested time: 30 minutes

Picture Sentences

1. Draw a line or lines, to represent the words. Compare your drawings with other students.

a) Slope of a line.

b) Distance between two points.

c) Point on a line.

d) Point of intersection.

2. Put these words in the correct order to form instructions.

three all plot points

_____

the calculate of the triangle area

_____

of the find slope [fg]

_____

equation find of [fg] the

_____

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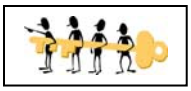
NAME: _____ DATE:_____

MATHS: Coordinate geometry

Level: A1 / A2
Type of activity: pairs or individual

Focus: word identification, vocabulary
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***

axis	y	disco	x
point	garden	coordinates	line
warm	find	line	slope
prove	evaluate	colour	measure

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

to construct _____

to evaluate _____

to extend _____

to measure_____

to show _____

Check that these key words are in your personal dictionary.

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NAME: _____ **DATE:**_____

MATHS: Coordinate geometry

Level: A2 / B1
Type of activity: individual

Focus: key vocabulary, writing descriptive text
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.

dis_ _nce _____

eva_ _ate _____

per_ _ndi_ _lar _____

mi_ _oint _____

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

_____

_____

_____

_____

_____

NAME: _____ DATE:_____

MATHS: Coordinate geometry

Level: A1 / A2
Type of activity: pairs or individual

Focus: key vocabulary, spelling
Suggested time: 20 minutes

Unscramble the letters

1. These are lines that meet at right angles EARENDIRPCULP

Answer _____

2. This is the point (0, 0) – the point from which other points are measured IGRION

Answer _____

3. A group of numbers that tell you where a point or line is OSINCAORDTE

Answer _____

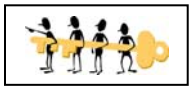
4. A fixed reference line that you use to measure coordinates SAXI

Answer _____

Solve the secret code

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

example: (code) LVPHB = STORY (English)



YWPCWVHB KL XAQ! =

_____

NAME: _____ **DATE:**_____

MATHS: Coordinate geometry

Level: B1
Type of activity: individual/pair

Focus: Reading comprehension, sentence construction
Suggested time: 20 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. You can use your textbook to help you.

1. Isolate the term _____ the left of the '=' term.
2. Divide across by the _____ before the y term.
3. The _____ of the line is the number before the x term.
4. To find where a _____ cuts the x-axis, let y equal to 0.
5. To find where a line cuts the y-axis, let y _____ to 0.
6. When squaring a negative number be sure to first put the number in a _____.
7. Please check the first diagram and understand clearly why the base is 8 units and why the _____ height is 3 units.
8. Find the _____ of point d, the midpoint of [ab].
9. Prove that the _____ of the Δ prw is equal to 14.
10. To find the _____ of a line we need: the slope of the line [m] and a point on the line [x,y].

Word Box

slope	equation	area	coordinates	number
on	equal	perpendicular	line	bracket

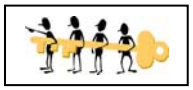
NAME: _____ DATE:_____

MATHS: Coordinate geometry

Level: A2 / B1
Type of activity: individual

Focus: key vocabulary, topic information, reading comprehension
Suggested time: 30 minutes

Multiple choice



Question 2

(a) Given t(-2, 3) and *u*(5, -1)
(i) Find the slope of [*tu*].
(ii) Find the equation of [*tu*].
(b) *r*(O, -4), *p*(O, 3) and *w*(4, 1)
(i) Calculate distance |*pr*|.
(ii) Plot points *r*, *p* and *w*.
(iii) Prove that the area of Δ*prw* is equal to 14.
(c) Find *t* given that (2, 3*t*) is on the line $5x + 2y - 4 = O$.

Question 3

(a) Given T: $3x - 2y - 12 = 0$
Find:
(i) Point *k*, where line T intersects the *x*-axis.
(ii) Point *l*, where line T cuts the *y*-axis.
(iii) Ca1culate the area of the triangle *klo* where 0 is the origin.
(b) With *v*(3, -4) and *w*(-2, 6) find:
(i) The slope of [*vw*].
(ii) The equation of [*vw*].

1. In Question 2, which of these are you asked to find?

a) equation of [*pr*] b) slope of [*tu*]
c) slope of [*tx*] d) equation of [*xy*]

2. What are you asked to do with points *r*, *p* and *w*?

a) wash them b) nothing
c) plot them d) find their slope

3. What must you prove about the area of Δ*prw*?

a) that it is greater than 14 b) that it doesn't exist
c) that it is less than 14 d) that it is equal to 14

4. Should you calculate the area of the triangle *klo*?

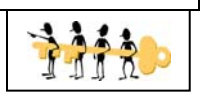
a) Yes b) No

5. Should you find the slope of [*lk*]?

a) Yes b) No

NAME: _____ **DATE:**_____
MATHS: Coordinate geometry

Level: B1 **Type of activity:** individual and pairs	**Focus:** identifying verbs and nouns **Suggested time:** 30 minutes



Grammar points

1. Nouns and verbs

There are nouns and verbs from this unit in the box below. Beside each word, put a n – noun or v – verb.

(Careful: one of the words could be either a noun of a verb, depending on the way it is used).

prove	area	construct	draw	form	coordinates	distance	
equation	find	geometry	midpoint	origin	line	axis	give
intersect	measure	show	cut	formula			

2. Compare your answers with another student's, or with the Answer Key.

3. This unit is full of instructions: *find the co-ordinates*, *prove that the area*….

Practise giving instructions by using the base of the verb (the imperative) to give instructions for one of the following:

- **How to draw a triangle.**
- **How to use a compass.**
- **How to use a dictionary.**

NAME: _____ DATE:_____

MATHS: Coordinate geometry

Levels A1 and A2 - 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.

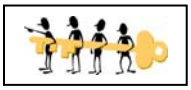
NAME: _____ DATE:_____

MATHS: Coordinate geometry

Maths Word Search

Level: All levels

Find the words in the box below.



```
                K B K J U
              V P R O V E X B
            B W L C Z     T O J
          P O I N T E       H Z X
        M A W F N M E         G M H
        W Y G I V E N         Y D V F I N D
    V Q D I S T A N C E X T R I A N G L E W
  R E V A L U A T E J R S L O P E L E T M C
F C M I D P O I N T R Q O R I G I N Z K Q O
E P M N B P G H S K C O O R D I N A T E S Q
A M S L A R E A E Q U A T I O N C Y C V O O
C L F T Y P E I N T E R S E C T S K L I N E
  E P E R P E N D I C U L A R W F A X I S
    G A A Z               C U T I
      L I                   X G
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AREA	EVALUATE	MIDPOINT	TRIANGLE
AXIS	FIND	ORIGIN	TYPE
COORDINATES	GIVEN	PERPENDICULAR	
CUT	INTERSECTS	POINT	
DISTANCE	LET	PROVE	
EQUATION	LINE	SLOPE	

NAME: _____ DATE:_____
MATHS: Coordinate geometry

Play Snap:

Do up Snap cards with 2 sets of the same keywords on them, shuffle them and let your students play cards.
Get the students to write the words for you.

midpoint	**midpoint**
distance	**distance**
prove	**prove**

NAME: _____ DATE:_____

MATHS: Coordinate geometry

slope	**slope**
triangle	**triangle**
axis	**axis**

NAME: _____ DATE:_____

MATHS: Coordinate geometry

equation	**equation**
perpendicular	**perpendicular**
given	**given**

NAME: _____ DATE:_____

MATHS: Coordinate geometry

line	line
type	type
let	let

Answer key

Working with words, page 6

1. a, c
2. y is equal to half x minus one
   y is equal to minus two x minus one
   x one plus x two over two (or divided by two) comma y one plus y two over two (or divided by two) comma

Picture sentences, page 7

Plot all three points.
Calculate the area of the triangle.
Find the slope of [fg].
Find the equation of [fg].

Odd One out, page 8

1. disco, garden, warm, colour

Maths Keywords, page 9

Distance (noun), evaluate (verb), perpendicular (adjective), midpoint (noun)

Unscramble the letters, page 10

Perpendicular, origin, coordinates, axis
Secret Code: Geometry is fun.

Completing Sentences, page 11

1. on the left of
2. number
3. slope of the line
4. line cuts the axis
5. let y equal to 0
6. put the number in a bracket
7. perpendicular height
8. coordinated of
9. area of
10. the equation of a line

Multiple Choice, page 12

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

Grammar points, page 13

Verbs: prove, construct, draw, find, give, intersect, measure ,show, cut
Nouns: area, coordinates, distance, equation, geometry, midpoint, origin, line, axis, formula

Noun and verb: form (a shape) to form (to make a shape)

Word Search