Maths
Trigonometry

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	Trigonometry
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:

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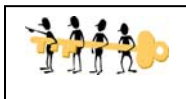
 Indicates that answers may be found at the end of the unit.

Keywords
The list of keywords for this unit is as follows:

Nouns
angle
calculator
cos (cosine)
degrees
distance
equation
flagpole
formula
function
ground
hypotenuse
ladder
length
measurement
plane
Pythagoras
ratio
sides
sin (sine)
speed
step
tan (tangent)
x

Verbs
to calculate
to construct
to draw
to evaluate
to find
to form
to give
to intersect
to investigate
to join

to leave
to let
to measure
to plot
to prove
to show
to travel

Adjectives
adjacent
adj (adjacent)
after
false
following
known
longest
nearest
opposite
opp (opposite)
perpendicular
Pythagorean
straight
trigonometric
true
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
70⁰   70 degrees

Vocabulary file 1

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

Word	Meaning	Word in my language
equation		
degree		
formula		
length		
measurement		
ratio		

Get your teacher to check this, then file it in your folder.

Vocabulary file 2

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

Word	Meaning	Word in my language
adjacent		
opposite		
perpendicular		
vertical		
to plot		
to show		

Get your teacher to check this and then file it in your

folder.

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

Working with words

1. Tick the correct answer
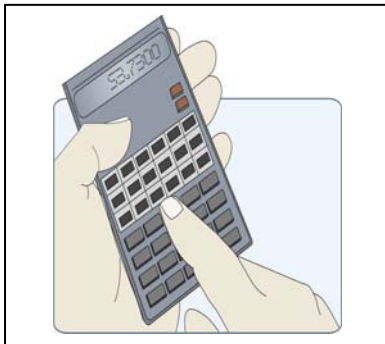
☐ a) a compass

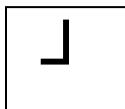☐ b) a calculator

☐ c) a mobile phone

☐ d) a watch

☐ a) a flagpole

☐ b) a street lamp

☐ c) a goal post

☐ d) a stick

2. Tick which answer you think is best.

In maths, trigonometry is about:
  a) the sizes of angles and the lengths of the sides of a triangle.
  b) numbers and amounts which are shown in letters and symbols
  c) collecting and studying numbers to show information

The symbol in the box means:

  a) a 360° angle
  b) a 180° angle
  c) a 90° angle

MATHS: Trigonometry

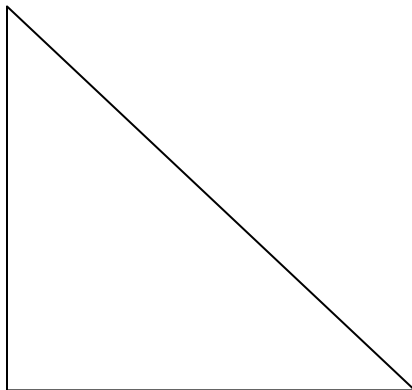| |
|---|
| **Level**: A1
Type of activity: pairs or individual |

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

Picture Sentences

1. **This is a right-angled triangle. Read the descriptions of the <u>hypotenuse</u>, <u>opposite</u> and <u>adjacent</u> and see if you can mark them on the triangle. You can check this in your textbook.**

<u>Hypotenuse</u> – opposite the 90º angle
<u>Opposite</u> – opposite the second given angle
<u>Adjacent</u> – the side which joins the two angles

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

hypotenuse the length find of the

_____

the side the find length of marked x

_____

the triangle why right angled explain is

_____

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*)

sin   tan   cos   water

hypotenuse   angle   bird   triangle

blue   opposite   nearest   adjacent

calculator   grass   measurement   number

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

adjacent _____

opposite _____

perpendicular _____

vertical _____

straight _____

Check that these key words are in your personal dictionary.

| **Level**: A2 / B1
Type of activity: individual | **Focus:** key vocabulary
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.

calc_ _at_r   _____

ad_ _ce_t   _____

tri_ _no_ _try   _____

eva_ _ate   _____

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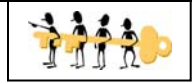
_____

_____

_____

_____

_____

NAME: _____ DATE:_____

MATHS: Trigonometry

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

Focus: key vocabulary, spelling
Suggested time: 20 minutes

Unscramble the letters

1. This is Maths that deals with triangles   GIMORTYNTROE

    Answer _____

2. The longest side of a right-angled triangle   SEPTYENUHO

    Answer _____

3. Something that is next to something else   JANACTED

    Answer _____

4. The space between two lines that cross each other   GALEN

    Answer _____

Solve the secret code

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

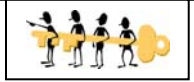**example: (code) DFKKWK = MIRROR (English)**

HKFYWQWDXHKC FL YKXBH! =

_____

| Level: A2/B1
Type of activity: pairs or individual | Focus: vocabulary, sentence structure, reading comprehension
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.

In the given diagram
(1) we have two _____ of a right angled triangle.
(2) we are looking for the measure of the third side.
We therefore use the _____ of Pythagoras.

_____

Very important, before using your calculator ensure that it is in DEG mode (for a Sharp _____) or in D mode (for a Casio calculator).
This can be seen on the _____ of the screen.

_____

This is the first of two _____ that are asked very frequently.
Please read _____ and follow the steps below when answering any question of this type.

_____

Again, write _____ sides in fraction form and cross-multiply.

_____

Calculate the _____ of the flagpole.

_____

Word Box

| carefully | calculator | height | both |
| top | questions | sides | theory |

Level: A2 / B1 Type of activity: individual	Focus: key vocabulary, topic information, reading comprehension Suggested time: 30 minutes

Multiple choice

Text: Sample Questions

Question 3

(a) A ladder is shown here leaning against a wall. The bottom of the ladder is 3 m out from the wall.
If the ladder is 4 m in length, calculate *p*, the angle formed by the ladder and the ground.

(b) If 0 = 50° and E = 20°
Investigate whether the following statements are true or false:
(i) 3 Cos D = Cos 3D
(ii) Sin (D + E) = Sin D + Sin E
(iii) Tan (D - E) = Tan D - Tan E

1. What is the ladder shown to be leaning against?
    a)   a wall   b)   a door
    c)   nothing   d)   the ground

2. How far out from the wall is the bottom of the ladder?
    a)   50 m   b)   20 m
    c)   3 m   d)   4 m

3. What is *p*?
    a)   a ladder   b)   an angle
    c)   the ground   d)   a wall

4. Should you use 0 = 50° and E = 20° in (b)?
    a)   Yes   b)   No

5. Should you work out if the statements are true or false?
    a)   Yes   b)   No

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

Grammar points

1. Preposition Hunt

Preposition: a word or group of words that is used before a noun or pronoun to show place, direction, time etc.

Circle the 10 prepositions in this box. Score 4 points for each correct answer. Who will score the highest? Perhaps you will. Good luck!

Pythagoras	to	at	perpendicular	from
triangle	draw	up	between	evaluate
of	false	onto	equal	step
out	down	angle	plane	symmetry
image	outline	in	mean	nearest

2. Missing Prepositions. The following are six sentences from your maths textbook. Some of the prepositions are missing. Decide which ones.

- Find the height _____ the tower in metres, correct _____ one decimal place.
- A boy is flying a kite _____ a string of length 30m.
- A hot-air balloon is attached _____ the point *p* _____ a piece of string.
- Find the angle _____ elevation of the sun, correct _____ the nearest degree.
- Find the angle _____ the ladder and the wall.
- Use this information to find the height _____ the Eiffel tower, correct _____ the nearest metre.

4. **Now it's your turn! Go to your maths textbook and the unit on trigonometry. Rewrite some of the sentences, leaving out the prepositions. Swap your sentences with another student, fill them in and correct them for one another.**

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?

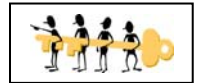Get your teacher to check this, then file it in your folder so you can use it in the future.

Maths Word Search

Level: All levels

Find the words in the box below.

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

ADJACENT	COSINE	NEAREST	SIN
ANGLE	EVALUATE	OPPOSITE	STEP
CALCULATE	FLAGPOLE	PLANE	TAN
CALCULATOR	HYPOTENUSE	SHIFT	TANGENT
COS	LADDER	SIDES	TRIGONOMETRIC

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.

✂

calculator	**calculator**
opposite	**opposite**
calculate	**calculate**

angle	**angle**
sin	**sin**
cos	**cos**

tan

tan

X

X

nearest

nearest

sides	**sides**
plane	**plane**
evaluate	**evaluate**

Answer key

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

Picture sentences, page 7
Find the length of the hypotenuse.
Find the length of the side marked x.
Explain why the triangle is right angled.

Odd One out, page 8
1. water, bird, blue, grass

Maths Keywords, page 9
calculator (noun), adjacent (adjective), trigonometry (noun), evaluate (verb)

Unscramble the letters, page 10
trigonometry, hypotenuse, adjacent, angle
Secret Code: Trigonometry is great.

Completing Sentences, page 11
In the given diagram
(1) we have two **sides** of a right angled triangle.
(2) we are looking for the measure of the third side.
We therefore use the **theory** of Pythagoras.

Very important, before using your calculator ensure that it is in DEG mode (for a Sharp **calculator**) or in D mode (for a Casio calculator).
This can be seen on the **top** of the screen.

This is the first of two **questions** that are asked very frequently.
Please read **carefully** and follow the steps below when answering any question of this type.

Again, write **both** sides in fraction form and cross-multiply.

Calculate the **height** of the flagpole.

NAME: _____ DATE:_____

MATHS: Trigonometry

Multiple Choice, page 12
1.a, 2.c, 3.b, 4.a, 5.a

Grammar points, page 13
Prepositions: to, at, from, up, between, of, onto, out, down , in

- Find the height **of** the tower in metres, correct **to** one decimal place.
- A boy is flying a kite **from** a string of length 30m.
- A hot-air balloon is attached **to** the point p **to** a piece of string.
- Find the angle **of** elevation of the sun, correct **to** the nearest degree.
- Find the angle **between** the ladder and the wall.
- Use this information to find the height **of** the Eiffel tower, correct **to** the nearest metre.

Word Search

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