Maths

Angles and constructions

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	**Angles and constructions**
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:

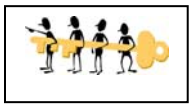
  - Bring the relevant **subject textbooks** to language support class. It does not matter if they have different textbooks as the activities in these units refer to vocabulary and other items that will be found in all subject textbooks. These units are based on curriculum materials.
  - Take some **responsibility 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
angle/angles
arc/arcs
bisector
centimetre (cm/cms)
compass
construction
diagram
diameter
hypotenuse
isosceles
line
metre (m/ms)
millimetre (mm/mms)
parallelogram
point (pt)
protractor
semicircle
triangle

Verbs
to angle (verb)
to construct
to draw
to evaluate
to extend
to measure
to show
to swing

Adjectives
alternate
angled
constructed
end
equal
formed
measured
middle
move
opposite
perpendicular
rough
straight

Other
from
greater than
vertically

Symbols
Δ triangle
|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

Vocabulary file 1

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

Word	Meaning	Word in my language
angle		
arc		
centimetre		
compass		
diagram		
diameter		

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

Vocabulary file 2

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

Word	Meaning	Word in my language
semicircle		
triangle		
alternate		
opposite		
perpendicular		
rough		

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

NAME: _____ DATE:_____

MATHS: Angles and constructions

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

Working with words

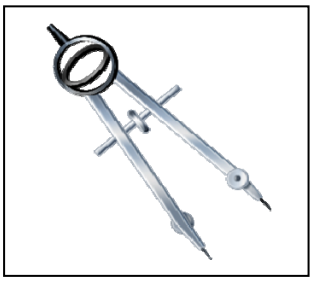
1. Draw lines in the boxes, then compare them with other students

horizontal lines (*level and flat)*

vertical lines (*pointing straight up*)

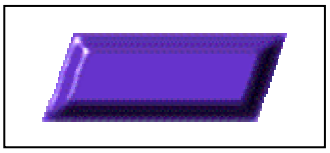
diagonal lines (*straight and sloping)*

2. Answer the following questions: this is



a) a knife
b) a fork
c) a compass

a) a triangle
b) parallelogram
c) a sphere

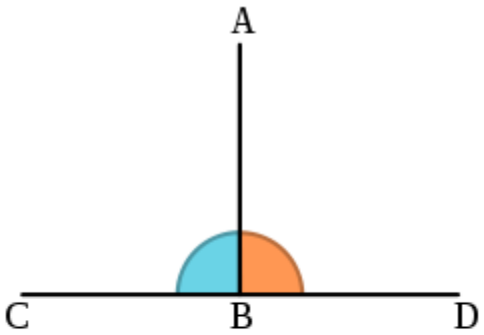


NAME: _____ DATE:_____
MATHS: Angles and constructions

Level: A1 **Type of activity:** pairs or individual	**Focus:** vocabulary, basic sentence structure **Suggested time:** 30 minutes

Picture Sentences

1. Tick the correct answer



1). ☐ a) the line AB is perpendicular to the line CD

☐ b) the line AD is perpendicular to the line CD

☐ c) the line AC is perpendicular to the line CD

2). ☐ a) the orange and blue angles are each 30 degrees.

☐ b) the orange and blue angles are each 90 degrees

☐ c) the orange and blue angles are each 180 degrees

Put these words in the correct order to form instructions

parallelogram the area calculate of the

_____

angle the copy below

_____

construction all lines show clearly

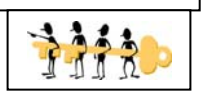
_____

NAME: _____ **DATE:**_____

MATHS: Angles and constructions

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***

compass arc phone point

Isosceles triangle line cold angle

parallelogram hungry equal opposite

draw angle line grey

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 draw _____

to extend_____

to measure_____

to show _____

Check that these key words are in your personal dictionary.

NAME: _____ **DATE:**_____
MATHS: Angles and constructions

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.

di_ _et_r _____

alt_ _n_te _____

hy_ _ten_se _____

cons_ _uct _____

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

_____

_____

_____

_____

_____

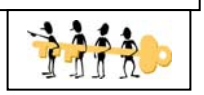
_____

NAME: _____ DATE:_____

MATHS: Angles and constructions

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

Unscramble the letters



1. This is a small unit of measurement TIECREMENT

   Answer _____

2. This is used to draw circles and arcs MASPSOC

   Answer _____

3. When you work out the size of something EMEURSA

   Answer _____

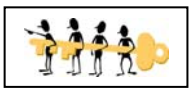
4. On the other side POSTOPIE

   Answer _____

Solve the secret code

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

example: (code) JUBQL = STAMP (English)



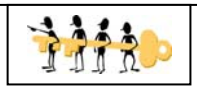
YKBE BZ BKX EGUF B XVQLBJJ! =

_____

NAME: _____ DATE:_____
MATHS: Angles and constructions

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. If you find this exercise tricky, look though your textbook to help you.

1. A _____ line is equal to 180º.
2. Vertically _____ angles are equal.
3. The opposite sides of a _____ are equal in measure.
4. The _____ of a parallelogram bisect each other.
5. To _____ means to cut into two equal parts.
6. The _____ of a parallelogram is (base) x (perpendicular height).
7. The diameter passes through the _____ of a circle.
8. There are only ____ different constructions which you have to know.
9. All constructions lines should be drawn in _____.
10. Constructions lines account for a lot of marks, so show them _____.

Word Box

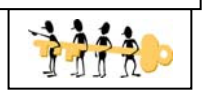
bisect	area	clearly		centre
four	pencil	straight	opposite	
parallelogram		diagonals		

NAME: _____ DATE:_____

MATHS: Angles and constructions

Level: A2 / B1
Type of activity: individual

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



Multiple choice

Text: CONSTRUCTING TRIANGLES

Type 1

Construct Δ*abc* such that |*ab*| = 4 cm, |*bc*| = 6 cm and |*ac*| = 5 cm.

(1) Draw a rough diagram of what Δ*abc* should look like.

(2) Draw [*ab*] 4 cm in length. Put the compass on pt. *a*. Draw an arc 5 cm from *a*. Put the compass on pt. *b*. Draw an arc 6 cm from *b*.

(3) Pt. *c* is the point where the arcs meet.

Type 2

Construct Δ*mnp* such that |*mn*| = 6 cm, |*np*| = 7 cm and |<*mnp*| = 72°.

(1) Draw a rough diagram. Because n is the middle letter, <*mnp* is at the point *n*.

(2) Draw [*mn*]. We pick this line because it includes the point *n*.

(3) At pt. *n*, use a protractor to measure an angle of 72°. Draw a line to show the angle.

(4) From pt. *n* draw an arc 7 cm.

(5) Point *p* is where the arc and the construction line intersect.

1. When constructing a triangle, what do you draw first?

a) nothing b) a rough diagram
c) a compass d) a protractor

2. Where is pt. *c*?

a) on pt. *b* b) nowhere
c) on the compass d) where the arcs meet

3. Where should you use a protractor to measure an angle of 72°?

a) at pt. *n* b) on a rough diagram
c) on pt. *p* d) nowhere

4). Should you draw an arc 4 cm from pt. *n*?

a) Yes b) No

5). Should point *p* be where the arc and the construction line intersect?

a) Yes b) No

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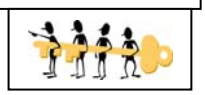
NAME: _____ DATE:_____
MATHS: Angles and constructions

Level: B1 **Type of activity:** individual and pairs	**Focus:** 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!

maths	through	at	angle	compass
arc	measure	up	along	construct
of	equal	on	middle	move
out	for	diameter	point	metre
image	outline	in	draw	to

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

- Calculate the value ___ x and y.
- Give a reason _____ each answer.
- The two base angles are equal ___ p°.
- ___ the diagram o is the centre of the circle.
- p,q,r and x are four points ___ the circumference of a circle.
- The angle ___ a semi circle is always 90°

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

NAME: _____ DATE:_____

MATHS: Angles and constructions

Levels A1 and A2 - *Alphaboxes*

Using your textbook, find U**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.

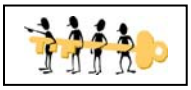
NAME: _____ DATE:_____

MATHS: Angles and constructions

Maths Word Search

Level: All levels

Find the words in the box below.



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

ALTERNATE	CONSTRUCTION	HYPOTENUSE	PERPENDICULAR
ANGLE	DIAGRAM	ISOSCELES	POINT
ARC	DIAMETER	LINE	SEMICIRCLE
BISECTOR	DRAW	MEASURE	STRAIGHT
COMPASS	EQUAL	OPPOSITE	SWING
CONSTRUCT	EVALUATE	PARALLELOGRAM	TRIANGLE
			VERTICALLY

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.

✂

semicircle	**semicircle**
construct	**construct**
draw	**draw**

NAME: _____ DATE:_____
MATHS: Angles and constructions

evaluate	**evaluate**
equal	**equal**
diagram	**diagram**

NAME: _____ DATE:_____

MATHS: Angles and constructions

compass	**compass**
Isosceles triangle	**Isosceles triangle**
cm (centimetre)	**cm (centimetre)**

NAME: _____ DATE:_____

MATHS: Angles and constructions

line	line
point	point
bisector	bisector

Answer key

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

Picture Sentences, page 7
1. a, b
2.Calculate the area of the parallelogram.
Copy the angle below.
Show all construction lines clearly.

Odd one out, page 8
1. phone, cold, hungry, grey

Maths keywords, page 9
1. diameter (noun), alternate (adjective or verb), hypotenuse (noun), construct (verb)

Unscramble the letters, page 10
Centimetre, compass, measure, opposite
Secret Code: Draw an arc with a compass.

Completing sentences, page 11
1. straight line.
2. opposite angles
3. parallelogram
4. diagonals
5. bisect
6. area
7. centre
8. four
9. pencil
10. clearly

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

NAME: _____ DATE:_____

MATHS: Angles and constructions

Grammar Points, page 13

1. Prepositions: through, at, up, along, of, on, out, for, in , to
2.

- Calculate the value **of** x and y.
- Give a reason **for** each answer.
- The two base angles are equal **to** p°.
- **In** the diagram o is the centre of the circle.
- P,q,r and x are four points **on** the circumference of a circle.
- The angle **of** a semi circle is always 90°

Word Search

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