

# Maths

## Higher Level Working with Sets, indices and surds

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 Sets, indices and surds	
<b>All students:</b> Activities that are suitable for <b>Learning Support, Language Support</b> and the <b>Mainstream Subject Class</b> include:	Keywords	3
	Vocabulary File	4-5
	Completing Sentences	11
	Multiple Choice	12
	Wordsearch	16
<b>Learning support and Language support:</b> 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	15
	Play Snap	17-20
<b>Language support:</b> Additional activities for Language Support:	Grammar points	13-14
<b>Levels for Language Support</b>	<b>A1 – B1</b> The language level of each activity is indicated in an information box.	
<b>Learning focus</b>	Using Maths textbooks and accessing curriculum content and learning activities.	
<b>Acknowledgement</b>	The <i>English Language Support Programme</i> acknowledges the permission of Gill and Macmillan to reproduce excerpts from <i>Shortcuts to Success. Maths. Junior Certificate Higher Level</i> 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.

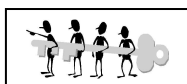


Have you ticked this activity on your Learning Record?

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

bracket  
class  
collection  
complement  
diagram  
element  
index/indices  
information  
intersection  
pupils  
sets  
subsets  
surds  
union  
Venn diagram

### Verbs

to calculate  
to complete  
to copy  
to describe  
to draw  
to evaluate  
to examine  
to express  
to fill  
to give/given

to illustrate  
to involve  
to like  
to list  
to look  
to prefer  
to state  
to study

### Adjectives

above  
below  
both  
favourite  
given  
less  
neither  
particular  
popular  
similar  
written

### Other

hence = so = therefore  
if  
if there are  
whether

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### Vocabulary file 1

Word	Meaning	Note or example*
set		
subset		
element		
Venn diagram		
union		
brackets		
intersection		

\*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.

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### Vocabulary file 2

Word	Meaning	Note or example
find		
illustrate		
complete		
draw		
copy		
both		
neither		



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

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



## Working with words

### 1. Tick the correct answer



- a) a set of cars
- b) a set of traffic
- c) a set of traffic signs
- d) a set of hands



- a) a set of racing cars
- b) a set of traffic
- c) a set of family cars
- d) a set of bikes

### 2. Think of another word for **set**:

- a. collection
- b. mixture
- c. circle

### 3. A set can have many **elements** (cars, traffic signs, odd numbers, even numbers). Think of another word for **element**.

- a. people
- b. member
- c. group

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



## Picture Sentences

1. Tick the verb to match the picture.

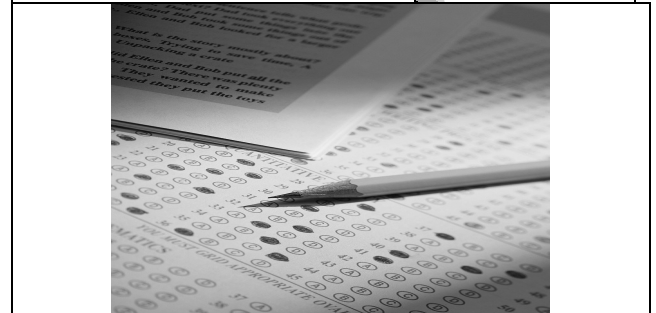
- a) to draw
- b) to find
- c) to shade in



- a) to draw
- b) to find
- c) to shade in



- a) to draw
- b) to find
- c) to shade in



2. Put these words in the correct order to form instructions.  
elements list the a of set

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each sets of describe these

---

following copy statements the

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



### Odd One Out

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

Example: *apple orange banana taxi*

draw	illustrate	copy	car
set	subset	cat	element
Monday	December	Wednesday	Friday
computer	circle	square	triangle

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

to examine \_\_\_\_\_

to list \_\_\_\_\_

to describe \_\_\_\_\_

to state \_\_\_\_\_

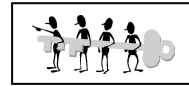
to copy \_\_\_\_\_



Check that these key words are in your personal dictionary.



Language Level: A1 / A2  
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.

ill\_\_tra\_e \_\_\_\_\_

el\_\_ent\_ \_\_\_\_\_

s\_bs\_t \_\_\_\_\_

int\_\_se\_\_ion \_\_\_\_\_

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

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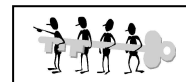
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Language Level: A1 / A2  
Type of activity: pairs or individual  
Suggested time: 20 minutes



## Unscramble the letters

1. When you liked one thing more than another FEEDERRRP

**Answer** \_\_\_\_\_

2. To be an element of, or to belong to MMBEER

**Answer** \_\_\_\_\_

3. A pair of marks that are used to enclose figures CRAEBTSK

**Answer** \_\_\_\_\_

4. Use a picture to make something clear TRIUSLTAEEL

**Answer** \_\_\_\_\_



## Solve the secret code

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

example: (code) FBQY = GAME (English)

XUBFWBQO BWY FWYBL! =

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



## Completing sentences

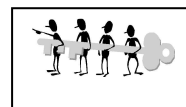
The sentences on this page are all instructions from your textbooks. Fill in the blanks in these sentences. Use words from the Word Box below.

1. Which of the following could be described as mathematical \_\_\_\_\_?
2. List the \_\_\_\_\_ of the following sets.
3. \_\_\_\_\_ in words each of these sets.
4. State whether each of the following is true or \_\_\_\_\_.
5. Copy and \_\_\_\_\_ the symbol in each of the following.
6. State if each of the \_\_\_\_\_ is a null set.
7. \_\_\_\_\_ the Venn diagram on the right.
8. \_\_\_\_\_ at the Venn diagram and say if each of the following is true or false.
9. \_\_\_\_\_ the Venn diagram and list the elements of the following sets.
10. Describe the \_\_\_\_\_ area in each of the sets below.

### Word box:

shaded	copy	false	examine	insert	sets
look	describe	elements	following		

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



## Multiple choice

Read the text below and choose the best answers

### 2-SET VENN DIAGRAMS

There are two types of written problems which may be asked involving 2-set Venn diagrams. They are very popular and must be known.

#### Type 1

There are 30 pupils in a class. Each pupil is asked to name their favourite soccer player. 16 said Damien Duff and 12 said Robbie Keane, while 5 liked both players. Illustrate the information on a Venn diagram and hence find:

- (i) How many like neither player.
- (ii) How many like Damien Duff only.

1. How many types of written problems involving 2-set Venn diagrams are there?
  - a) one
  - b) two
  - c) none
  - d) 16
2. What do we call the members of a class at school?
  - a) Robbie Keane
  - b) Damien Duff
  - c) pupils
  - d) soccer players
3. What did 5 of the pupils like?
  - a) Venn diagrams
  - b) nothing
  - c) Robbie Keane
  - d) both players
4. Should you use a Venn diagram to make a picture from this information?
  - a) Yes
  - b) No
5. Should you find out how many pupils liked Robbie Keane only?
  - a) Yes
  - b) No

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



## Grammar points

1. In this Unit, we came across the following adjectives:

- similar
- preferred
- numerical

Look up these words in your textbook or dictionary and write your own definition.

Adjective	Meaning	Note or example
similar		
preferred		
numerical		

2. In this unit we came across many verbs which are used to give instructions during maths.

### Verb Hunt

Circle 10 verbs from the unit in these columns.

Score 4 points for each correct answer.

Who will score the highest? Perhaps you will. Good luck!

- |          |            |
|----------|------------|
| find     | growth     |
| health   | final      |
| heart    | look       |
| broken   | copy       |
| draw     | illustrate |
| complete | list       |
| shade    | examine    |
| union    | describe   |
| word     | head       |



Score: \_\_\_\_\_ points

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



## Grammar points

### Neither and either

We use either and neither to talk about two things or two people.

Either = the one or the other

Neither = has a negative meaning

Example: Neither suitcase was big enough = both suitcases were too small.

### 1. Answer the questions in this quiz by using neither (with nor).

*Example: How many of these are days of the week?*

*Tuesday, January, February.*

*Neither January nor February are days of the week.*

1. How many of these are in Dublin?

The spire, Buckingham palace, the Eiffel Tower

2. How many of these are in Ireland.

The pyramids, the Blarney stone, the Sphinx

3. How many of these are in the USA?

Johannesburg, Chicago, Cairo

4. How many of these are in Africa?

Chad, Borneo, Burma

5. How many of these are mountains?

The Danube, the Nile, Kilimanjaro

6. How many of these are in Australia?

Sydney, Buenos Aires, Caracas

7. How many of these are in Europe?

Boston, New York, Paris

8. How many of these are rivers?

The Alps, the Andes, the Nile

### 2. Invent similar quiz questions and give them to a partner to answer.

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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

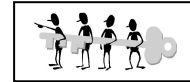
Do you understand all these words?



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

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## Word Search



Find the words in the box below.

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

BOTH	DRAW	ILLUSTRATE	PREFER
BRACKETS	ELEMENT	INTERSECTION	SETS
COMPLEMENT	FILL	LESS	SOLUTIONS
COMPLETE	FIND	LIKE	SUBSET
COPY	GIVEN	LOOK	UNION
DIAGRAM	HENCE	NEITHER	VENN



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## Play Snap

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



illustrate	illustrate
Venn diagram	Venn diagram
sets	sets

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<b>draw</b>	<b>draw</b>
<b>complete</b>	<b>complete</b>
<b>both</b>	<b>both</b>

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<b>neither</b>	<b>neither</b>
<b>elements</b>	<b>elements</b>
<b>brackets</b>	<b>brackets</b>

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_  
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<b>given</b>	<b>given</b>
<b>look</b>	<b>look</b>
<b>hence</b>	<b>hence</b>

## Answer key

### Working with words, page 6

1. c, a
2. a
3. b

### Picture sentences, page 7

1. b,a,c
2. List the elements of a set.  
Describe each of these sets.  
Copy the following statements.

### Odd One Out, page 8

Car, cat, December, computer

### Maths key words, page 9

Illustrate (verb), elements (noun), subset (noun), intersection (noun)

### Unscramble the letters, page 10

Preferred, member, brackets, illustrate  
Secret Code: diagrams are great

### Completing Sentences, page 11

Which of the following could be described as mathematical **sets**?

List the **elements** of the following sets.

**Describe** in words each of these sets.

State whether each of the following is true or **false**.

Copy and **insert** the symbol in each of the following.

State if each of the **following** is a null set.

**Copy** the Venn diagram on the right.

**Look** at the Venn diagram and say if each of the following is true or false.

**Examine** the Venn diagram and list the elements of the following sets.

Describe the **shaded** area in each of the sets below

### Multiple choice, page 12

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

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**Grammar points, page 13**

Verbs: find, draw, complete, shade, look, copy, illustrate, list, examine, describe

**Grammar points, page 14**

Neither Buckingham Palace nor the Eiffel Tower is in Dublin.

Neither the pyramids nor the Sphinx are in Ireland.

Neither Johannesburg nor Cairo is in the USA.

Neither Borneo nor Chad is in Africa.

Neither the Danube nor the Nile are rivers.

Neither Buenos Aires nor Caracas are in Australia.

Neither Boston nor New York is in Europe.

Neither the Alps nor the Andes are rivers.

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Word Search:

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