

Activities and Exercises for Logical-Mathematical Learners of English



Rolf Palmberg

Palmsoft Publications



About the author

Rolf Palmberg is a senior lecturer at Åbo Akademi University at Vaasa, where he teaches EFL methodology in the university teacher-training programmes for class teachers, foreign-language teachers and special-education teachers.

E-mail: rolf.palmberg@abo.fi.

Website: <http://www.vasa.abo.fi/users/rpalmber/>.

Postal address: P.O. Box 311, FI-65101 Vaasa, Finland.

Title page photo: Sign on a house in Kiev, Ukraine © Rolf Palmberg (2008).

Earlier versions of portions of this eBook have been published as indicated at the end of each section.

This version © Rolf Palmberg (2009).

CONTENTS

Introduction	2
1. Twenty-one reasons for counting	4
2. Way of the sausage	5
3. Pupils counting pupils	7
4. Colour Street	8
5. Mary's puzzle	12
6. The house of numbered rooms	15
7. Chop Suey	18
8. The Greek t-shirt – pen-and-paper version	23
9. In the kitchen	26
10. Operation MathLog	29
11. The Greek t-shirt – CALL version	32
12. Pitch black or snow white?	35
13. Tri-national borders	38
14. Going Dutch	43
15. Lost in the classroom	46
16. Word play	50
17. A 'Buffet snack' sign	53
References	57
Websites	59

INTRODUCTION

We are not all the same. According to Howard Gardner, creator of the Multiple Intelligences (MI) Theory, we all have personal intelligence profiles that consist of combinations of eight or nine different intelligence types. These are verbal-linguistic, logical-mathematical, visual-spatial, bodily-kinaesthetic, musical-rhythmic, interpersonal, intrapersonal, naturalist, and, possibly, existentialist intelligence (Gardner 1983, 1993, 1999).

Depending on their personal MI profiles, people tend to develop their own favourite way (or ways) of learning a foreign language. For vocabulary, some prefer traditional rote learning. Others divide the foreign words into parts or components and concentrate on memorising these instead. Some look for similarities between the foreign-language words and grammatical structures and the corresponding words and structures in their mother tongue or other languages they may know. Some people find mnemonic devices helpful, at least occasionally. Others have adopted different types of accelerated learning techniques and use them on a more or less permanent basis. One such technique, to give an example, was introduced in the 1970's as the "keyword method" (Atkinson 1975). It requires learners to create a mental picture for the foreign word they want to remember, another picture for the meaning of the word, and then to link the two pictures together. This technique can be applied to grammatical structures as well.

One of the most important messages of the MI Theory is this: if education is to work as effectively as possible, learners' MI profiles should be taken into account rather than ignored. As far as the teaching of English as a Foreign Language (EFL) is concerned, there exist quite a number of books that apply Gardner's MI Theory exclusively to EFL teaching. Two very recommendable titles are Michael Berman's **A Multiple Intelligences Road to an ELT Classroom** (1998/2002) and Mary Ann Christison's **Multiple Intelligences and Language Learning** (2005).

As the title of this eBook suggests, **Activities and Exercises for Logical-Mathematical Learners of English** is aimed specifically at one of the intelligence types identified in Gardner's MI Theory, i.e. logical-mathematical learners. According to the MI Theory, such learners are particularly fond of numbers and logical reasoning. This, of course, is the reason why Armstrong calls them "number/reasoning smart" (1999). In an EFL context, they typically enjoy tasks that involve solving problems, finding patterns, completing brain teasers, conducting experiments, learning about how language works, thinking

about and working with numbers, categorising and sorting. For vocabulary learning, other suitable EFL exercises for logical-mathematical learners are crosswords and various types of word grids.

The present eBook comprises activities and exercises that emphasise different aspects of EFL vocabulary knowledge. Some of them concentrate on the finding and identification of existing words or understanding texts and sentences. Others focus on the development of learners' critical thinking skills and their ability to explore and understand multiple-meaning words and riddles. Sometimes the activities and exercises require learners to have access to the Internet and/or specific computer programs (which are downloadable free of charge).

Part of the material has been written especially for this eBook, including photocopiable worksheets for many of the exercises and activities. Part of the material consists of previously published material or modified versions of such material. In many cases the edited material has been supplied with accompanying worksheets. For all material, the original source has been acknowledged. Although the activities and exercises are intended for learners of EFL, many of the ideas introduced in this eBook can also be used with learners of other target languages.

1.

TWENTY-ONE REASONS FOR COUNTING

This exercise provides young learners in particular with a motivating reason for reciting numbers from 1 to 21 in a foreign language.

Procedure

The rules are simple. Learners work in pairs, and each learner must add either one or two numbers to an accumulating list of numbers starting from one. The learner who says 21 has lost. A typical dialogue might go like this:

Learner A: One,
Learner B: two, three,
Learner A: four, five,
Learner B: six, seven,
Learner A: eight,
Learner B: nine, ten,
Learner A: eleven, twelve,
Learner B: thirteen,
Learner A: fourteen, fifteen,
Learner B: sixteen, seventeen,
Learner A: eighteen,
Learner B: nineteen, twenty,
Learner A: twenty-one. :-(

After a couple of tries some of the learners will most probably have figured out how they can (almost) always beat their partner. Can you figure it out?

Acknowledgement

This exercise first appeared in [IATEFL Voices](#) 194 (2007).

2. WAY OF THE SAUSAGE

Language teachers often spend the first ten or fifteen minutes of a lesson revising texts that were introduced to the learners during a previous lesson. Here is an activity that provides variety and pupil motivation and, what is more, keeps the learners alert. It is suitable for individual work, pair work, and group work.

Step One

Take a familiar text, for example this one:

Our house

I live in a red house near the main road. Our house has eight rooms and two balconies that overlook a big garden. On the ground floor we have a kitchen, a living-room with many paintings on the walls, a dining-room where we have all our meals and a computer room with lots of books in a huge bookcase that fills the whole wall. On the first floor there are three bedrooms.

Step Two

Prepare a text version where all nouns have been deleted and replaced with one single (but totally irrelevant) word, for example 'sausage'. The text entitled 'Our house' would thus read:

Our **sausage**

I live in a red **sausage** near the main **sausage**. Our **sausage** has eight **sausages** and two **sausages** that overlook a big **sausage**. On the ground **sausage** we have a **sausage**, a **sausage** with many **sausages** on the **sausage**, a **sausage** where we have all our **sausages** and a **sausage** with lots of **sausages** in a huge **sausage** that fills the whole **sausage**. On the first **sausage** there are three **sausages**.

Step Three

Hand out copies of the modified text to the learners. Tell them that their task is to recreate the original text individually, in pairs or in groups of three, either orally or in writing (depending on the teaching goals of the lesson and the time available). If the learners like the activity (and most of them inevitably will), challenge them to prepare similar exercises at home (to be used later in class).

Acknowledgement

This exercise is based on a teaching idea by Neville Britten (1983). In his paper he suggested that 25 words in the target text be substituted with 25 (different) words for the learners to find. The 'sausage' version of Britten's idea was first presented in Palmberg and Palmqvist (1988) and, twenty years later, in an abstract on the [TeAchnology](#) website.

3.

PUPILS COUNTING PUPILS

This very short activity is an alternative way of finishing a lesson that has introduced and practised the vocabulary needed to talk about the different parts of the face. At the same time it will remind learners of the fact that there exist so many words in English that have multiple meanings.

The Final Step but One

Revise the vocabulary items needed to talk about the different parts of the face. Remember that the word ‘pupil’ must be included and make sure that the pupils understand that it means ‘the opening in the centre of the iris of the eye’.

The Final Step

Finish the lesson by asking the pupils how many pupils there are in the classroom. They will most probably come up with a number of incorrect answers before the correct one, even after they have first discovered that ‘pupil’ also means ‘somebody who is learning in school’. Make sure that you know the answer before asking the question.

Solution

Count the number of people in the classroom, including you. Multiply the number by three, and then subtract one. The result is the correct answer to your question. Why? Because each person in the classroom has two pupils, and in addition to that each person is a pupil – except for you, the teacher!

Acknowledgement

This activity first appeared in Palmberg (2004) as part of a lesson plan entitled “Hands and arms and legs”.

4. COLOUR STREET

The purpose of this activity is to practise learners' logical thinking skills and at the same time provide them with something meaningful to talk about. The activity is suitable for all proficiency levels.

Step One

Prepare a transparency of the worksheet on page 10 and enough copies for the learners (one copy each). Also, prepare enough copies of the fact sheet on page 11 and cut the copies into pieces (one piece of information on every slip of paper). The fact sheet contains six pieces of information, which means that every sixth learner will have identical slips of paper. Finally, print out a copy of the final task on page 11 (to be kept on the teacher's desk).

Step Two

Display the transparency of the worksheet on an OHP. Explain to the learners that their task is to walk around in the classroom and, by talking to each other and by using logical thinking, find out who lives in which house. Explain to them how to fill in the worksheet and emphasise that they should talk to their classmates, think, rethink, and avoid guessing.

Step Three

Hand out one worksheet and one slip of paper to each learner. Tell the learners to walk around in the classroom and ask each other what they know about the people who live on Colour Street. Advise them to make careful notes on their worksheets of what they learn. Remind them that they should tell the people who ask them questions only what is stated on their own slips of paper (**NOT** what they have already written on their worksheets). Also, remind them that they should **TALK** to each other; **NOT** show anybody their slips of paper or worksheets.

Step Four

Tell learners who have completed their worksheets that there is a final task waiting for them on the teacher's desk.

Solutions

The people on Colour Street are, in this order: Mr Bryan Yellow, Mrs Elsie White, Mrs Claire Green, Mr Bruce Blue, and Mr Frank Red.

The answer to the final task is, not surprisingly considering the topic, a colour: black.

Acknowledgement

This logical problem first appeared on one of the **Operation MathLog** web pages (see Section 10).

COLOUR STREET – WORKSHEET

INSTRUCTIONS

There are five houses on Colour Street. As you can see, they all have different colours. The houses come in this order:



Five people live on Colour Street, one person in each house. Their names are, in alphabetical order:

Mr Blue, Mrs Green, Mr Red, Mrs White, and Mr Yellow.

Your task is to find out who lives in which house.

Make notes in this box:

--

Write down all facts in this box:

the owner of ...	the red house	the yellow house	the blue house	the white house	the green house
mr / mrs					
first name					
family name					

COLOUR STREET – FACT SHEET

1	Nobody lives in a house with the same colour as his or her name.
2	Elsie White likes Bryan, her neighbour.
3	Frank and Bruce are neighbours.
4	Mr Red has only got one neighbour.
5	Bruce is always cheerful despite his name.
6	Claire lives next to the white-coloured house.

COLOUR STREET – FINAL TASK

When you have decided who lives in which house, you must take

- 1. the 1st letter from the name of the person who lives in the first house,**
- 2. the 2nd letter from the name of the person who lives in the second house,**
- 3. the 3rd letter from the name of the person who lives in the third house,**
- 4. the 4th letter from the name of the person who lives in the fourth house,**
- 5. the 5th letter from the name of the person who lives in the fifth house.**

What word do the letters spell?

5. MARY'S PUZZLE

Reading a text in a foreign language is a complex process. It involves a variety of skills, ranging from what Neville Grant (1987) calls “plain sense reading” through “deductive reading” to “projective reading”. Plain sense reading, according to Grant, requires nothing more than what the term implies – i.e. the ability to understand what is stated in a text. Deductive reading involves the ability to draw inferences – deductions – from what is stated in a text. Or, in Grant’s words, learners should be able to do more than just “read the lines”; they should also be able to “read between the lines”. Projective reading, finally, involves the ability to relate a text to one’s personal opinions, knowledge, imagination, and experience. To put it differently: learners should be able to “read beyond the lines”.

This activity practises learners’ deductive as well as projective reading skills simultaneously. The text consists of just five – albeit cleverly designed – sentences. Yet most of the learners will no doubt have to revise their thinking several times during the activity. It is suitable for most proficiency levels.

Step One

Prepare an OHP transparency of the text entitled ‘Mary’s Puzzle’.

MARY'S PUZZLE

- 1. Mary was on her way to school.**
- 2. She was very worried about her maths lesson.**
- 3. Last week she couldn't control the class.**
- 4. It wasn't fair of the maths teacher to leave class responsibility to her.**
- 5. After all, it's not part of a xxx's duties to teach.**

Hand out a copy of the worksheet on page 14 to the learners (one copy each) and display the first of the five sentences on the OHP transparency. Ask the learners to write down on their worksheets a short answer to the question ‘Who is Mary?’ and give a reason why they think so. Next, ask them to share their thoughts in pairs or in groups of three or four.

Step Two

Display the second sentence on the OHP transparency. Again, ask the learners to write down an answer to the question ‘Who is Mary?’ and then share their answers with their classmates. Remind them that they do not have to stick to their original guess – they may change their answers whenever they want.

Steps Three, Four and Five

These steps follow the same procedure as the previous steps: read, think, write and discuss. For the fifth sentence, however, tell the learners that they must now decide who Mary is. Keep prompting for suggestions until someone comes up with the correct (or an acceptable) answer. You may have to help the learners with occupations for which they do not know the English words.

Solution

Mary is the school secretary.

Acknowledgement

The text ‘Mary’s Puzzle’ originates from Sanford and Garrod’s book **Understanding Written Language** (1981), rendered in its Finnish version as ‘Tuulan arvoitus’ in Blom, Linnankylä and Takala (1988). The present activity is a modified version of the procedure described in Blom, Linnankylä and Takala, where learners are asked to give their answers to the question ‘Who is Mary?’ only in writing.

MARY'S PUZZLE – WORKSHEET

Fill in this box when you have read sentence 1:

Who is Mary?	What makes you think so?
---------------------	---------------------------------

Fill in this box when you have read sentence 2:

Who is Mary?	What makes you think so?
---------------------	---------------------------------

Fill in this box when you have read sentence 3:

Who is Mary?	What makes you think so?
---------------------	---------------------------------

Fill in this box when you have read sentence 4:

Who is Mary?	What makes you think so?
---------------------	---------------------------------

Fill in this box when you have read sentence 5:

Who is Mary?	What makes you think so?
---------------------	---------------------------------

6. THE HOUSE OF NUMBERED ROOMS

This activity practises learners' text-reconstruction skills. It is suitable for most proficiency levels, provided that the learners are familiar with the vocabulary included in the text.

Step One

Explain to the learners that the text (displayed on an OHP transparency):

I live in a red house near the main road. Our house has eight rooms and two balconies that overlook a big garden.

could also be conveyed like this (displayed on an OHP transparency):

**ILIVEINAR EDHOUSENE ARTHEMAI NROADOU RHOUSEHA
SEIGHTRO OMSANDTW OBALCONI ESTHATOV ERLOOKAB
IGGARDEN**

Give the learners enough time to notice that there are no spaces or punctuation marks. Answer their questions, if there are any.

Step Two

Ask the learners to form pairs or groups of three and hand out copies of the worksheet on page 17. Give each learner his or her own worksheet, and emphasise that everyone has to fill in a worksheet of their own even if they work in pairs or in groups. Tell them that their task is to arrange the groups of letters in the box in their correct order and to provide the text with spaces and punctuation marks. Remind them that they must not add or delete any letters. They must not change the order of letters, either.

Step Three

When most of the learners have completed the task, ask them to share and compare their findings with their classmates.

Solution

This is the unscrambled version of the text:

I live in a big house. On the ground floor there are a kitchen, a hall, a living-room, a dining-room, a bathroom and a toilet. On the first floor there are three bedrooms, a bathroom and a small toilet. On the second floor there is an attic.

Acknowledgement

This exercise first appeared on one of the **Operation MathLog** web pages (see Section 10).

THE HOUSE OF NUMBERED ROOMS – WORKSHEET

INSTRUCTIONS

To be able to read the text, you must put the groups of letters in the box below in their correct order and provide the text with spaces and punctuation marks. Do not add or delete letters. Do not change the order of letters.

This is the beginning of a text: **ILIVEINAB**

NDFLOORTH	TONTHESE	ORTHEREI	ING-ROOMAB
LALIVING-	ALLTOILE	IGHOUSEO	DATOILE
EREAREAKI	REEBEDRO	HEREARETH	OMSABATHR
STFLOORT	NTHEGROU	ROOMADIN	ATHROOMAN
TCHENAHAL	CONDFLO	OOMANDASM	TONTHEFIR

The text ends with this group of words (not included in the box):
SANATTIC.

Write your passage in the box below. Use both lowercase and uppercase letters, and don't forget to add spaces and punctuation marks.

7. CHOP SUEY

The purpose of this activity is to increase learners' vocabulary knowledge and their awareness of possible (and impossible) letter combinations in English words. It is suitable for intermediate and advanced learners of EFL. Like many other activities in this eBook, it encourages the use of dictionary work in the classroom. As has been pointed out for example by Julie Moore, it is crucial that EFL teachers keep training their learners in the use of both monolingual and bilingual dictionaries (Moore 2005).

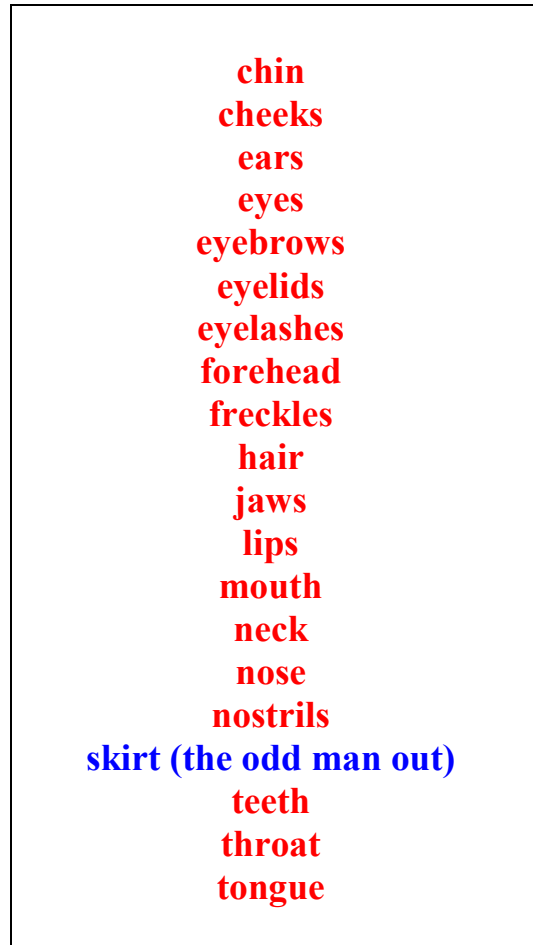
Step One

Hand out the worksheet on page 22 to the learners (one copy each). Tell them that there are twenty English words hiding in the grid, but that each word has been split into two parts (Task One). The topic (and most of the vocabulary) should be familiar to the learners, whose task is to identify which two word parts belong together and then combine the two parts to recreate the original words.

Ask the learners to work individually and write down the identified words in the first box on their worksheets. When they have identified enough words, ask them to fill in the topic that is shared by the words found (to be written into the second box). Finally, when they have identified all the words, ask them to decide which word has nothing to do with the topic (now using the third box).

Step Two

When most of the learners have found most of the words, display the word list on page 19 on an OHP transparency.



Go through the word list and make sure that the learners know what the words mean. Leave the transparency displayed on the OHP and ask the learners to continue their work. Invite them to consult the word list whenever needed.

Step Three

After a while, ask the learners to form pairs and discuss the word parts displayed on the worksheet. Invite them to look at the forty word parts and, for each word part, decide whether

- (a) it **is** an English word
- (b) it **could be** an English word
- (c) it **cannot be** an English word.

Each word part should be written down in one of the three boxes on the worksheet (Task Two). Also, ask the learners to discuss and (preferably) agree on their reasons for categorising the word parts the way they did.

Step Four

Hand out bilingual dictionaries to each pair of learners and ask them to check their results.

Step Five

When most of the learners have completed the task, ask them to form new groups of three or four and compare their findings with each other. If differing interpretations arise, be prepared to act as an authority on the subject. Some of the learners might, for example, argue that **IDs**, **PS** and **SE** are in fact words (even if they are technically abbreviations.)

Solution

The following word parts are existing English words: **fore** (meaning ‘in the front’), **ha** (a humorous exclamation), **head** (the word has several meanings), **ids** (the plural form of a psychological term for ‘the deepest part of the unconscious mind’), **in** (a preposition), **no** (meaning ‘not’, ‘not any’), **oat** (something made from a grass-like plant), **rows** (lines of people or things), **ski** (one of a pair of long narrow pieces of wood), **tee** (a specially shaped piece of plastic on which a golf ball is placed before it is hit) and **ton** (a unit of weight).

The word part **shes** is almost a word, but the apostrophe is missing (**she’s**).

The word parts **es** and **ir** are literally word parts (a suffix and a prefix, respectively), but not words. (**in**, of course, is not only a word; it is also a prefix.)

Some of the words parts, for example **che**, **gue**, **nost** and **rils**, contain perfectly acceptable letter combinations and there is no logical reason why they have not been assigned any meaning in English.

Most of the remaining words cannot be English words since they either lack vowels or contain letter combinations that do not exist in initial or end positions of English words.

Acknowledgements

This word grid first appeared on one of the **Operation MathLog** web pages (see Section 10). It was created in 2005 using an authoring program entitled **Word Chop**. Word chop was one of the alternatives offered by Discovery School on their **Worksheet Generator** website (which, unfortunately, has changed its selection of available authoring programs since then).

CHOP SUEY – WORKSHEET**TASK ONE (individual work)**

Combine the word parts in the box into words

ch	che	ck	ea	eks	es	ey	eyeb
eyel	eyela	fore	frec	gue	ha	head	ids
in	ir	ja	kles	li	mou	ne	no
nost	oat	ps	rils	rows	rs	rt	se
shes	ski	tee	th	th	thr	ton	ws

List the twenty words in the box below:

Which is the topic?

Which of the words has nothing to do with the topic?

TASK TWO (pair work)

List the word parts that (you think) **are** English words in the box below:

List the word parts that (you think) **could be** English words in the box below:

List the word parts that (you think) **cannot be** English words in the box below:

8.

THE GREEK T-SHIRT

– pen-and-paper version

As stated in the introduction to ‘Mary’s puzzle’ (Section 5), reading a text in a foreign language is a complex process. In Neville Grant’s words, learners should be able to read “between the lines” – which he calls “deductive reading” – but also “beyond the lines” – which he calls “projective reading”. There is, however, always the risk that learners may be tempted to draw too many inferences from their personal experience when reading a text. To balance their eagerness to read far beyond the lines, here is an exercise to remind them of the dangers involved in assuming too much when interpreting a text. The activity is suitable for intermediate and advanced learners of EFL.

Step One

Hand out the worksheet on page 25 to the learners (one copy each). Ask them to read through the text entitled ‘Have you been to Greece?’ several times and to use bilingual dictionaries to check any unfamiliar words. Next, ask them write down their first impressions of Michael as a person and to make a list of everything they know about Michael for a fact.

Step Two

Divide the learners into pairs and ask them to discuss Michael and to compare their lists of facts. Encourage them to give reasons for their opinions and assumptions.

Step Three

Display the background information shown on page 24 on an OH transparency. Next, ask the learners to rethink everything that they thought were facts but that proved in fact to be false assumptions. How could these misunderstandings have been avoided from a language point of view?

BACKGROUND INFORMATION

Michael has just returned from a week's holiday in Hawaii. He never drinks alcohol, but in order to cope with the hot sun he had to drink lots of mineral water every day. He has visited Greece only once, when he was a little boy of three. The t-shirt he's wearing is a gift from his sister who visited Greece some time ago.

Acknowledgement

The original version of this paper first appeared as “The Greek T-shirt – facts vs. assumptions” on **TEFL.net's Idea Thinktank** website (2009).

THE GREEK T-SHIRT – WORKSHEET**HAVE YOU BEEN TO GREECE?**

It is December. Michael is standing in the arrival hall at Helsinki airport, tanned and relaxed. He is wearing a white T-shirt with a red text saying Kos, Greece. Peter, an old friend from long ago, sees him and walks up to him.

“Hi, Michael. Have you been to Greece?”

“Yes, I have.”

“How was it?”

“To be honest, I can hardly remember anything at all.”

“You must remember something. What was the weather like?”

“It was raining non-stop every day.”

“Then how can you be so tanned?”

“I spent five or six hours in the sun every day last week.”

“Have you had a lot to drink lately?”

“Indeed I have. Several litres every day.”

Peter shakes his head and walks away.

TASK ONE

Write down your first impressions of Michael as a person:

--

TASK TWO

List everything you know about Michael for a fact:

--

9. IN THE KITCHEN

This exercise is an alternative way of finishing a lesson that has introduced and practised the vocabulary needed to talk about objects found in kitchens. There is no reason to tell the learners that the exercise is a continuation of the kitchen trail. Truly logical-mathematical learners will no doubt discover the connection long before everybody else.

The Final Step but Two

Revise the vocabulary items needed to talk about objects found in kitchens. Make sure to include the words needed for this exercise, too.

The Final Step but One

Tell the learners that there is one more exercise to be done before the end of the lesson. Their task is to find so-called ‘enclosures’ or, to put it differently, words that are hidden in given words or sentences. The hidden word can be enclosed in one single word or it can span several words in the sentence (spaces should be ignored). Examples are ‘cat’ in ‘education’ and ‘two’ in ‘he cannot work’ respectively:

education
he cannot work

The Final Step

Hand out the worksheet on page 28 to the learners (one copy each). Ask them to work individually or in pairs and follow the instructions given on the worksheet. Encourage them to use bilingual dictionaries if needed.

Solution

The hidden words are (in this order) ‘mug’, ‘ladle’, ‘teapot’, ‘fork’, ‘cup’, ‘toaster’ and ‘oven’.

Acknowledgement

The original version of this exercise first appeared on one of the **Operation MathLog** web pages (see Section 10).

IN THE KITCHEN – WORKSHEET

These seven sentences all contain at least one hidden word per sentence. The word can be enclosed in one single word or it can span several words in the sentence. Fill in all the hidden words that you can find in Box One. When you have found at least one hidden word in every sentence, start looking for the ones that are commonly associated with one specific place. Write the name of that place in Box Two. Here is a clue for you: the words you are looking for are all between three and seven letters long.

1. They are smuggling drugs.
2. She is a member of the national ad league.
3. Would you irritate a potential customer?
4. These films are not for kids.
5. Mary believes in acupuncture.
6. He is listening to a stereo performance.
7. His love never reads love stories.

BOX ONE

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

BOX TWO

10. OPERATION MATHLOG

Operation MathLog is an internet-based maze designed to develop learners' ability to explore and understand how language works and at the same time increase their knowledge of English vocabulary. It comprises a selection of language tasks of various kinds and different levels of difficulty, for example:

- **anagrams** (learners have to rearrange the letters of given words to form other words),
- **acronym tasks** (learners have to work with words formed from the initial letters of phrases or compound terms),
- **enclosures** (learners have to find words that are hidden in given words or sentences),
- **riddles** (learners have to solve riddles according to given clues),
- **jumbled sequences of letters** (learners have to rearrange sequences of letters that lack spaces and punctuation marks in order to create coherent text),
- **word search grids** (learners have to find words that are hidden in word grids either horizontally, vertically, diagonally, forwards, or backwards),
- **categorisation tasks** (learners have to categorise words according to given criteria),
- **word chop exercises** (learners have to identify words that have been chopped in half),
- **cryptograms** (learners have to decipher messages where letters have been exchanged according to a specific code; see e.g. Singh 1999),
- **problem-solving tasks** (learners have to find out the answer to logical problems based on given facts about people and/or specific circumstances),

and, of course, combinations of these. The tasks sometimes involve follow-up steps that require learners to arrange or rearrange given words in a specific order, to decide what theme or topic given words have in common, to spot the odd man out, etc.

Although Operation MathLog is called a maze, the route is mainly linear. Learners do occasionally face choice situations that appear to be true choices; yet the only purpose of these choices is to make sure that learners at specific

stages of the maze have in fact solved all previous tasks. Unlike traditional adventure programs from the early days of Computer-Assisted Language Learning (or CALL; see e.g. Higgins & Johns 1984; Davies & Higgins 1985), there are no help functions available.

The opening web page

The opening web page of Operation MathLog looks like this:

WELCOME TO OPERATION MATHLOG

**Do you like wordplay, riddles, numbers and logical puzzles?
Do you like mazes, problem solving and mystery stories?
Then **OPERATION MATHLOG** could be something for you.**

In this maze you will come across a series of mathematical-logical language tasks. You must solve each task correctly; otherwise you won't find your next task. How far can you go? Can you make it till the end?

PS! It's a very good idea to keep a record of the names and types of all tasks and keywords.

For your first task, replace the word **mathlog in the address line of this web page with the same word, but with the letters written in reverse order. Then press **ENTER**.**

Procedure

Tell are the only instructions given to potential players (i.e. learners). Each language task is presented on its own web page, but the only website address (from now on referred to as URL; short for Uniform Resource Locator) available to learners is that of the opening web page. In order to figure out the address of the following task, learners must first solve the (very simple) task presented on the opening web page. The same principle then applies throughout the maze: the word that constitutes the solution to a given task is the new keyword (or one of the possible keywords) that must be entered into the URL instead of the current keyword.

In situations where learners come across tasks that they cannot solve, truly logical-mathematical learners will probably be tempted to take on Operation MathLog as a logical rather than a linguistic challenge in their efforts to “beat the machine” (to quote Higgins & Johns 1984). They may, for example, try to locate any remaining tasks by using their knowledge of computer technology instead. In order to prevent, or at least to make computerised search more complicated, all web pages have (with the exception of the opening web page) deliberately been left ‘orphan’. This means that there are no hyperlinks to take learners from one web page to another; a fact that makes the maze ‘internet-based’ rather than ‘web-based’ (cf. Smith & Baber 2005). The URLs contain no easily recognisable keywords that could help potential hackers, either.

Acknowledgements

The opening web page of **Operation MathLog** has been online since September 2005. Its target group and the target learners of this eBook are, by and large, people sharing the same interest, numbers and logical reasoning. I have therefore transformed five of the tasks presented on the **Operation MathLog** web pages into suitable activities for this eBook. The five tasks are ‘Colour Street’ (Section 4), ‘The house of numbered rooms’ (Section 6), ‘Chop Suey’ (Section 7), ‘In the kitchen’ (Section 9), and ‘Pitch black or snow white?’ (Section 12). For obvious reasons the URLs of these tasks will not be given here.

Earlier versions of portions of this section first appeared in **CALL Review** (Spring 2006) and in **2006 International Conference. Beyond the Horizon: Extending the Paradigm of TEFL** (Seoul 2006: The Korea Association of Teachers of English).

11.

THE GREEK T-SHIRT

– CALL version

The lesson plan outlined below suggests yet an alternative way in which to practise learners' deductive and projective reading skills. The text used in this version is essentially the same as the one used for the pen-and-paper version described in Section 8, but the steps and methodological principles of this computer-assisted lesson are entirely different. While learners still have to read and re-read the emerging text both for specific and global information, their critical and logical reading skills are really put to the test.

Step One

Divide the learners into pairs and explain that they are going to work with a computer program called **THE GREEK T-SHIRT**. Explain to them how the program works (see 'About the program' on page 34) and encourage each pair to discuss (and agree on) their reading strategies before answering the first question.

Step Two

Ask those learners who have successfully completed the program to discuss the dialogue in the text. More specifically, ask them to answer these three questions (displayed on an OHP transparency) and make notes of the results:

(1) How could many of the misunderstandings have been avoided from a language point of view?

(2) What kind of questions should Peter have asked?

(3) What answers should Michael have given?

Step Three

When most of the learners have completed the program and their discussions, ask them to form new groups of three or four and share and compare their findings with each other.

Acknowledgements

The text entitled ‘The Greek T-shirt’ emerges step by step in the CALL program and is an edited version of the text ‘Have you been to Greece?’ The latter text first appeared in “The Greek T-shirt – facts vs. assumptions”, available on [TEFL.net’s Idea Thinktank](#) website (2009).

The CALL program **THE GREEK T-SHIRT** was produced by Palmsoft (2009) and is downloadable free of charge at my [Downloadable computer programs for EFL](#) website.

The disc image on page 34 is used courtesy of [Classroom Clipart](#).



About the program

THE GREEK T-SHIRT

The learners' task is to give correct answers to ten multiple-choice questions about the given text, 'The Greek T-shirt'. The first question is difficult, because the learners know nothing about the text. After each question, more and more words become visible. After ten questions, the whole text will be displayed on the computer screen.

This is the complete text:

It is December. Michael is standing in the arrival hall at Helsinki airport, tanned and relaxed. He is wearing a t-shirt with the text Kos, Greece. Peter, an old friend from long ago, walks up to him.

“Hi, Michael. Have you been to Greece?”

“Yes, I have.”

“What was the weather like?”

“It was raining non-stop every day.”

“Then how can you be so tanned?”

“I spent five or six hours in the sun every day last week.”

“Have you been drinking lately?”

“Indeed I have! Several litres every day.”

Michael has just returned from a week's holiday in Hawaii. He never drinks alcohol, but because of the sun he had to drink lots of water every day. He has visited Greece once, when he was three years old. The t-shirt is a gift from his sister who visited Kos a year ago.

In order to make the program more challenging, it contains a scoring system: learners gain five points for correct answers but lose ten points for wrong answers. If the score falls below zero points (there are 50 points available to start with), the program ends.

12. PITCH BLACK OR SNOW WHITE?

Playing with letters and words are activities that appeal to logical-mathematical people. Here is a puzzle that involves a well-known fairytale and anagrams. It is suitable for intermediate and advanced learners and requires online access to the Internet.

Step One

Tell the learners that an anagram is a reordering of the letters in a word or a phrase to form another word or phrase. The word **sword**, for example, is an anagram of the English word **words**. An example of a more complex anagram is the rearrangement of the letters in '**Clint Eastwood**' as '**Old West action**'.

Write these examples on the blackboard to illustrate your point. Ask the learners to give examples of funny anagrams they know either in English or in their mother tongue.

Step Two

Divide the learners into pairs and provide each pair with a computer. Hand out the worksheet on page 37 to them (one copy each). Ask them to read the instructions in the worksheet and try to figure out what the missing word is. Give them no clues whatsoever.

Step Three

If none of the learners comes up with any suggestions within the next few minutes, tell them that they have three clues at their disposal:

- (1) **the words “once upon a time”**,
- (2) **the title of the anagram puzzle**,
- (3) **the number of existing (or would-be) anagrams.**

Step Four

When someone comes up with the correct answer (probably in his or her mother tongue), ask the learners to use a search engine of their choice (for example [Alltheweb](#), [Alta Vista](#) or [Google](#)) to find the English names of Snow White's seven dwarves (and especially the missing one). Ask them to write down the names in Box One.

Step Five

Ask the learners to go to the [Anagram Genius](#) website and try to create funny anagram of the words 'fairytale' and/or 'snow white'. Ask them to write down some of their findings in Box Two and to use bilingual dictionaries or an online dictionary (for example [Merriam-Webster Online](#)) to find out what the anagrams mean (if anything at all). Tell the learners that they should write down the meanings in Box Two.

Step Six

When most of the learners have completed the task, ask them to form new groups of three or four and share and compare their findings with each other.

Solution

Happy is the missing dwarf.

Acknowledgements

The 'Clint Eastwood' anagram was found on the [Anagram Genius](#) website. It also offers a downloadable anagram creator for your amusement.

The dwarves anagram puzzle first appeared on one of the [Operation MathLog](#) web pages (see Section 10).

PITCH BLACK OR SNOW WHITE? – WORKSHEET

Once upon a time there were six anagrams and a missing word:

1	HALF BUS
2	EEL SPY
3	YES ZEN
4	GYP RUM
5	POD YE
6	COD
7	

Your task is to unscramble the letters of the six anagrams and figure out what the missing word is.

BOX ONE

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

BOX TWO

13. TRI-NATIONAL BORDERS

Geography can provide foreign-language learners with many interesting topics to talk about. The lesson plan outlined below offers many extra spices for logical-mathematical learners and is suitable for most proficiency levels.

Step One

Tell the learners that you have a geography puzzle for them. Next, display the following information on an OHP transparency:

A GEOGRAPHY PUZZLE

**You are standing on the Dutch-French border.
What is the name of the nearest international airport?**

Depending on the learners' interest in and knowledge of geography, you may get a wide range of comments. Some may claim that the puzzle cannot be solved at all, since it apparently does not contain enough information. Others may say that the correct answer will of course depend on your exact location. Learners who know their European map will point out that this is a trick question: the Netherlands and France do not share a border!

If you are lucky, the class expert in geography will tell his or her classmates otherwise. The answer can only be Princess Juliana Airport on Sint Maarten, which is the Dutch half of the divided Dutch-French island in the Caribbean. The French part of the island is called Saint-Martin, but it has no international airport. Both Sint Maarten and Saint-Martin are integral parts of their respective homelands, so the Dutch-French border does exist. But it is not in Europe, as one might expect. It is in the Americas.

Step Two

Tell the learners that it's time to shift their focus from bi-national to tri-national borders. A tri-national border (generally called a tripoint) is the place where the borders of three neighbouring countries meet. Contrary to what one might assume, the number of tripoints on a given continent has little to do with the number of countries on that continent. North and Central America, for example, comprises twenty-three countries. Yet there are only two tripoints. One of them is the one between Belize, Guatemala, and Mexico; the other one is the one between El Salvador, Guatemala, and Honduras.

Next, hand out some atlases and detailed maps of Europe to the learners and invite them to work in pairs. Ask them to study the map(s) for not more than half a minute and then make a guess: How many international tripoints are there in Europe?

Step Three

At this point you either have to pre-teach or revise the English names for the European countries and their adjectives. You may also have to remind the learners that some countries have different words for the actual adjective, for a person from that country, and for the country's language.

Step Four

Hand out the worksheet on page 42 to the learners (one copy each). First of all, ask them to fill in the number of presumed tripoints on the worksheet. Next, ask them to answer the remaining questions and write down their answers. Remind them to fill in the names of the tripoints in this form:

The Finnish-Norwegian-Swedish tripoint

not 'the tripoint between Finland, Norway and Sweden'.

Have a sufficient number of dictionaries available to enable learners to check the correct adjectives for the different countries. If you find that your atlases and maps of Europe are not detailed enough, a good solution is to have a number of computers logged onto **Google Earth**.

Step Five

When most of the learners have completed the task, ask them to form new groups of three or four and share and compare their findings with each other.

Step Six

If there is still time, invite the learners to do one of two things:

either

study the pictures of some of the tripoints and tripoint areas (displayed at my [European Tripointing](#) website) and choose their favourite tripoint

or

put their knowledge of European tripoints to the test using a computer program [THE TRIPOINT GURU](#) (see ‘[About the program](#)’ on page 41).

Solution

There are 48 international tripoints in Europe (including Kosovo; for a complete list, see my [European tripoint statistics](#) website). Austria has the largest number of international tripoints: nine. Nine European countries (Denmark, Iceland, Ireland, Malta, Monaco, Portugal, San Marino, United Kingdom, and Vatican City) have no international tripoints.

Acknowledgements

An outline of this lesson plan first appeared on the [Teaching Ideas](#) website.

The computer program [THE TRIPOINT GURU](#) was produced by Rolf Palmberg (2008) and is downloadable free of charge at my [European tripointing](#) website.

The disc image and the smiley image on page 41 are used courtesy of [Classroom Clipart](#) and [Smiley Central](#) respectively.



About the program

THE TRIPOINT GURU

The purpose of the program is to test whether the player is a tripoint guru or, to say it in other words, an expert on European tripoints. More specifically, the player's task is to give correct answers to twenty multiple-choice questions that are displayed on the computer screen in random order. Questions that are answered incorrectly will reappear (in random order) until the correct answer has been provided. The player's score is displayed in a progress window on the computer screen throughout the test and his or her performance is assessed in writing when all questions have been answered correctly.



NOTE!

A real tripoint guru needs no map to answer the questions correctly.

TRI-NATIONAL BORDERS – WORKSHEET

Answer this question first:

<p>How many international tripoints are there in Europe? Write down your guess.</p>	<p>Answer:</p>
--	-----------------------

<p>In the right-hand columns, list all the European tripoints that you can find. Remember to indicate whether the tripoints are dry (located on land) or wet (located in a river or in a lake).</p>	<p>Dry tripoints:</p>	<p>Wet tripoints:</p>
--	------------------------------	------------------------------

<p>Which country has the largest number of tripoints? How many tripoints has it got?</p>	<p>Answer:</p>
---	-----------------------

<p>Which European countries have no tripoints at all?</p>	<p>Answer:</p>
--	-----------------------

14. GOING DUTCH

In the previous section we were reminded of the fact some countries have different words for the actual adjective, for a person from that country, and for the country's language. But can we trust adjectives that seemingly indicate nationality? Or are they all Greek to us? This multi-step exercise is suitable for advanced learners and requires bilingual and monolingual English dictionaries.

Step One

Write the following expressions on the blackboard:

Russian roulette
French fries
Turkish bath
German measles

Ask the learners if they know what the expressions mean. Next, ask them which of these expressions (if any) actually have anything to do with the country to which they refer. Finally, invite anyone who has similar examples to share them with you and their classmates.

Step Two

Hand out the worksheet on page 45 to the learners (one copy each). Ask them to work in pairs and fill in the blanks in the ten sentences on the worksheet (all sentences have expressions that include the word 'Dutch'. Ten of the twenty words in the box are the correct ones. Invite the learners to use monolingual dictionaries to check their answers.

Step Three

When most of the learners have completed the task, ask them to form new pairs to share and compare their findings with.

Step Four

Next, ask the learners to stay with their new partner and use bilingual dictionaries and try to find (and agree on) good translations or translational equivalents in their mother tongue for the 'Dutch' expressions.

Step Five

Again, when most pairs have completed the task, ask them to form new groups of three or four and share and compare their findings with each other.

Solution

The correct expressions are, in this order: 'Dutch door', 'Dutch uncle', 'double Dutch', 'Dutch auction', 'Dutch courage', 'Dutch cap', 'went Dutch', 'Dutch treat', 'Dutch concert', and 'Dutch comfort'.

Acknowledgement

The idea for this exercise originates from Palmberg (1984), a Swedish-language article on nationalities and English idioms.

GOING DUTCH – WORKSHEET

TASK ONE. Fill the blanks in the ten sentences below using ten of the twenty words in the box. If needed, use a monolingual dictionary.

**auction, beer, brother, cap, coat, comfort, concert,
courage, door, double, fight, kissing, made, party,
pig, sale, table, treat, uncle, went**

1. A **Dutch** _____ is a door that is divided horizontally. You can shut the upper part and lower part separately.
2. He was very angry and talked to me like a **Dutch** _____.
3. I could not understand a word of what he was saying. He must have been talking _____ **Dutch**.
4. I bought this car at a **Dutch** _____. They reduced the price little by little and soon I had enough money to buy it.
5. Let's get drunk. I need a lot of **Dutch** _____ to be able to do this.
6. They don't want to have any babies so she wears a **Dutch** _____.
7. We _____ **Dutch** with each other the other day when we had lunch: we shared the expenses equally.
8. Last week we had a **Dutch** _____ which was quite the opposite: everyone paid his or her own meal.
9. There was a **Dutch** _____ outside our house last night. A lot of drunken men were screaming and quarrelling for over an hour.
10. **Dutch** _____ means that things could have been worse.

TASK TWO. Use a bilingual dictionary to find out how to translate the 'Dutch' expressions into your mother tongue. Number the translations and write them down on the other side of this worksheet.

15. LOST IN THE CLASSROOM

This exercise offers an alternative way of finishing a lesson that has introduced and practised the vocabulary needed to talk about the different objects found in the classroom. It is suitable for young learners in particular. The learners can work individually or in pairs.

Step One

Hand out the worksheet on page 49 to the learners (one copy each). Tell them that there are eleven words hiding in the word grid and that they are all objects that are normally found in the classroom. The words they may be written horizontally, vertically, diagonally, backwards, forwards, upwards or downwards.

Step Two

After a couple of minutes, display an OHP transparency showing the mother-tongue equivalents of the classroom words to help the learners along. Invite them to use bilingual dictionaries whenever needed.

Step Three

When most of the learners have completed the task, ask them to form groups of three or four and share and compare their findings with each other.

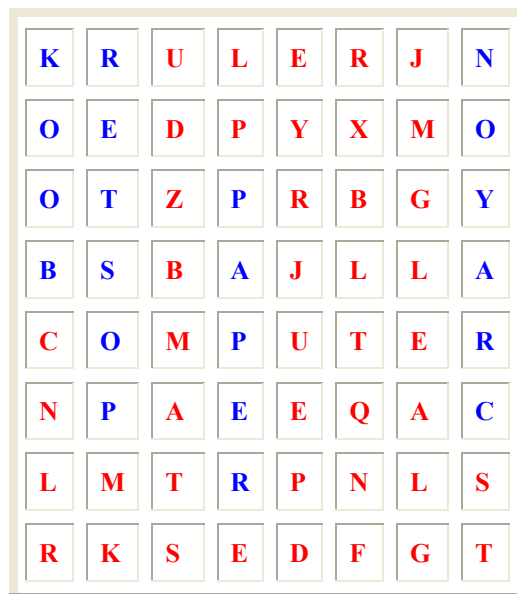
Solution

There eleven classroom words hiding in the grid are 'board', 'book', 'computer', 'crayon', 'desk', 'glue', 'map', 'paper', 'pen', 'poster', and 'ruler'.

Three of the words are written horizontally: two forwards ('computer' and 'ruler') and one backwards ('desk'):



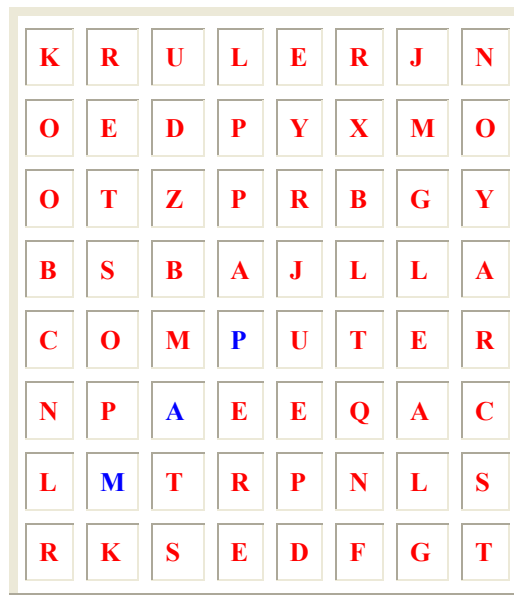
Four words are written vertically: one downwards ('paper') and three upwards ('book', 'poster', and 'crayon'):



Three of the words are written diagonally: two downwards (going to the right) ('board' and 'pen') and one downwards (going to the left) ('glue'):



The last word is written diagonally upwards (going to the right) ('map'):



Acknowledgement

This word grid was created using an authoring program entitled **Word Search**, one of the many alternatives available on **Discovery Education's Puzzlemaker** website.

LOST IN THE CLASSROOM – WORKSHEET**INSTRUCTIONS**

There are eleven words hiding in the word grid that are objects that you can normally find in the classroom. Your task is to identify and circle the words. **NOTE** that the words they may be written horizontally, vertically, diagonally, backwards, forwards, upwards or downwards. Can you find all the words?



Write the words in this box:

--

16. WORD PLAY

The purpose of this activity is to increase learners' vocabulary awareness and at the same time practise their dictionary skills. It is aimed primarily at intermediate and advanced learners, but its level of difficulty can easily be modified by selecting words that are more suitable to the learner group(s) in question. Note that the shorter the words selected, the easier the task.

Step One

Ask the learners to write down about ten words from a given topic, for example from the one introduced during their previous English lesson (in this case 'objects found in the classroom'). Tell them to concentrate on words that have, preferably, no more than five letters. After a minute or so, ask them to call out words from their lists, one learner and one word at the time.

Step Two

Choose two of the words that were called out, for example “**desk**” and “**board**”. (You may have to do a little prompting in order to get the words you want – otherwise you will have a hard time to produce a word sequence like the one below quickly enough). Next, write the word sequence

desk deck beck back bark bard board

on the blackboard and ask the learners, in pairs, to figure out what you do with each word in the list to produce the following word in the list. In other words, what do you do with **desk** to produce **deck**; with **deck** to produce **beck**; with **beck** to produce **back**; with **back** to produce **bark**; with **bark** to produce **bard**; and finally, with **bard** to produce **board**? Ask the learners to come up with as simple and general rules as possible.

Step Three

After a couple of minutes, ask them what rules they have come up with, if any. Somebody will hopefully suggest (either or both of) these two rules:

You may change a letter in the word
You may add a letter to the word

If so, tell the learners that there are two additional rules, and then display the complete set of rules on an OHP:

You may change a letter in the word
You may add a letter to the word
You may delete a letter from the word
You may NOT change the order of letters in any word

Discuss the rules and if needed, give clarifying examples.

Step Four

Choose two other words from the list of classroom words suggested by the learners and write them on the blackboard. Challenge the learners to see how quickly they can produce a similar sequence of words, starting with one of the two words on the blackboard and ending with the other one. Invite them to aim at as short a word sequence as possible, and tell them to follow the four rules displayed on the OHP. Also, encourage the use of monolingual dictionaries to ensure that the words created really are English words.

Step Five

Ask those learners who have finished their word sequences to check what the words used mean in their mother tongue. Next, ask them to prepare short stories that contain the words used in their word sequences, preferably in the same order.

Step Six

Invite all pairs to present their word sequences to their classmates. Ask everyone to make sure that all words used in the word sequences really are English words. One way of doing this is to ask anyone in doubt to ask the presenters what the words mean in their mother tongue.

Step Seven

If there is still time, ask those learners who had time to prepare short stories to read some of them out in class.

Acknowledgement

This is a third version of an activity first presented in Palmberg (2004) and later in Palmberg (2006).

17.

A 'BUFFET SNACK' SIGN

Projective reading, as described by Neville Grant (1987) and already referred to in Sections 5 and 8, involves the ability to “read beyond the lines”, or, to put it differently, the ability to relate a text to one’s personal opinions, knowledge, imagination, and experience. What, if anything, changes when the “lines” to be understood comprise both words and images? The present activity gives learners of English at most proficiency levels something meaningful to talk about and at the same practises their projective reading skills.

Step One

Display the photo on page 55 on an OHP transparency. Ask the learners to look at the photo for half a minute or so, and, individually, try to decide what it tries to communicate?

Step Two

Hand out the worksheet on page 56 to the learners (one copy each) and ask them to discuss and answer the questions in pairs or in groups of three.

Step Three

When most of the learners have completed the task, ask them to form new groups of three or four and share and compare their findings with each other.

Step Four

Tell the learners that the sign was photographed outside a pool bar at a hotel in Agadir, Morocco. French is Morocco’s unofficial second language and most of the country’s tourists come from France, so it comes as no surprise that French is the first language on the sign. The remaining languages indicate that there are also many tourists coming to Morocco from the United Kingdom, Germany and

Spain. The hotel owners obviously do not want their customers to enter the pool bar in (wet) swimwear, since this could mean that the next customers get their clothes wet.

Step Five

Ask the learners to form new groups and discuss how the text and/or the image on the sign could be changed to avoid any misunderstandings.

Acknowledgement

The photo was taken by Rolf Palmberg in March, 2009.



BUFFET SNACK

**Veillez utiliser T-shirt et
chaussures pour entrer**

**Please, use a T-shirt and shoes
before coming in**

**Bitte, benutzen Sie ein Ober teil
und Schuhe zu Rein zu kommen**

**Rogamos, utilicen una camiseta
y zapatos antes de entrar**

BUFFET SNACK – WORKSHEET

With your partner or in your group, discuss the questions below and try to agree on your answers. Write down your answers and comments for each question.



QUESTIONS

1. What are the four languages on the sign?	
2. In what country (or countries) would you expect to see a sign like this?	
3. Where (type of place) do you think this sign is posted?	
4. Are all kinds of shirts allowed inside that place?	
5. What about shoes?	
6. And what about trousers?	
7. What is the general purpose of the sign?	
8. Who do you think put it up, and for whom?	

REFERENCES

- Armstrong, Thomas (1999). **7 Kinds of Smart: Identifying and Developing Your Many Intelligences**. New York: Plume Books.
- Atkinson, R. C. (1975). "Mnemotechniques in second-language learning." **American Psychologist** 30.
- Berman, Michael (1998/2002). **A Multiple Intelligences Road to an ELT Classroom**. Carmarthen: Crown House Publishing.
- Blom, Leena, Pirjo Linnankylä & Sauli Takala (1988). **Tekstien avaaminen luokassa. Jyväskylän yliopisto**. Kasvatustieteiden tutkimuslaitoksen julkaisusarja B. Teoriaa ja käytäntöä.
- Britten, Neville (1983). "Reactive reading." **Practical English Teaching** 3:3.
- Christison, Mary Ann (2005). **Multiple Intelligences and Language Learning. A Guidebook of Theory, Activities, Inventories, and Resources**. San Fransisco: Alta Books.
- Davies, Graham & John Higgins (1985). **Using Computers in Language Learning: A Teacher's Guide**. London: CILT.
- Higgins, John & Tim Johns (1984). **Computers in language learning**. London: Collins.
- Gardner, Howard (1983). **Frames of Mind. The Theory of Multiple Intelligences**. New York: Basic Books.
- Gardner, Howard (1993). **Multiple Intelligences. The Theory in Practice**. New York: Basic Books.
- Gardner, Howard (1999). **Intelligence Reframed. Multiple Intelligences for the 21st Century**. New York: Basic Books.
- Grant, Neville (1987). **Making the Most of Your Textbook**. London & New York: Longman.
- Moore, Julie (2005). "Natural language learning (3)." **English Teaching professional** 36.

Palmberg, Rolf (1984). "Om nationaliteter och engelska idiom." **Tempus** 4.

Palmberg, Rolf (2004). **Developing EFL Learners' Vocabulary Awareness**. EnglishClub.com.

Palmberg, Rolf (2006). "Vocabulary awareness activities for EFL learners." **IATEFL Voices** 189 [2006].

Palmberg, Rolf & Olav Palmqvist (1988). "Varying text revision." **Practical English Teaching** 8:3.

Singh, Simon (1999). **The Code Book: The Evolution of Secrecy from Mary, Queen of Scots to Quantum Cryptography**. New York: Doubleday.

Smith, David Gordon & Eric Baber (2005). **Teaching English with information technology**. London: Modern English Publishing.

WEBSITES

NOTE! These websites were working at the time of writing. Things do, however, change – nothing stays the same. If a link results in a **404 Page not found** message, please use a search engine of your choice (for example **Alltheweb**, **Alta Vista** or **Google**) and try to find something corresponding to what you were looking for instead. Good luck!

Anagram Genius. www.anagramgenius.com.

Classroom Clipart. <http://classroomclipart.com>.

Discovery Education's Puzzlemaker.
<http://puzzlemaker.discoveryeducation.com/>.

Downloadable computer programs for EFL.
<http://www.vasa.abo.fi/users/rpalmber/download.htm>.

EnglishClub.com. <http://www.esldepot.com/>.

European tripointing. <http://www.vasa.abo.fi/users/rpalmber/borders3.htm>.

European tripoint statistics.
<http://www.vasa.abo.fi/users/rpalmber/tristats.htm>.

Google Earth. <http://earth.google.com/>.

Merriam-Webster Online. <http://www.merriam-webster.com/>.

Operation MathLog. <http://www.vasa.abo.fi/users/rpalmber/mathlog.htm>.

Smiley Central. <http://www.smileycentral.info/>.

Teaching ideas. <http://www.teachingideas.co.uk/>.

TeAchnology. <http://www.teach-nology.com/>.

TEFL.net's Idea Thinktank. <http://edition.tefl.net/ideas/>.