ENRICHMENT ACTIVITIES FOR MORE ABLE STUDENTS 2

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and
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Illustrated by
CRAIG DIXON

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INTRODUCTION

The pack

Enrichment Activities for More Able Students 2 consists of a variety of challenging activities which will present students with opportunities to develop problem-solving, thinking, presentational and interpersonal skills. The worksheets cover a wide range of themes and issues and are designed to be used within any lesson.

Student suitability

The worksheets can be used by teachers of all subjects who wish to provide material to challenge their most able students at Key Stage 3. Many of the sheets could also be used at Key Stage 4, and even 6th form. Because the pack is photocopiable, you can use it flexibly, with individual students, small or large groups, or across a whole year set.

Using the pack

You can use the sheets to provide work for individuals, pairs or groups of students who have finished the main work of the lesson, or to provide homework. The sheets could also be used to provide lesson material for tutor groups. Teachers covering someone else's class, or supply teachers, might also find the pack useful. The General Guidelines at the beginning of the pack provide basic advice for using the sheets. The Teachers' Notes provided opposite each worksheet give the page's aims, preparation needed, classroom management advice, differentiation possibilities, answers and extension activities. We presume that you have access to pen, paper and chalkboard, and that students are used to working both individually and in small and large discussion groups. If you have a query about how best to use the pack, we are happy to help; please write to us at the address below.

The people involved

John Morton, the consultant for this pack, is Head of Sixth Form at the Crossley Heath School, Halifax. Lisa Fabry was the writer for this pack. The pack was illustrated by Craig Dixon, and the cover and series design was by Michael Lopategui. Rob Redfern was the editorial co-ordinator, and Karen Reed was the layout artist and editor. The original idea for Enrichment Activities packs comes from David George, president of the National Association for Able Children in Education and the consultant author of our first *Enrichment* pack. The pack was printed by Prontaprint Barking and The Modern Printers. The Chalkface format was created by Susan Quilliam.

Photocopy laws

How to contact us

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Lesson-specific Teachers' Notes are to be found on the page facing each worksheet.

General Guidelines

The Teachers' Notes opposite each page support the use of each specific page as required. These more general guidelines give advice on using the whole pack. They offer suggestions on preparation, running the lesson and follow-up work, and could form the basis of in-service training prior to using the pack.

Please remember to photocopy both the relevant Teachers' Notes and these General Guidelines if you are copying worksheets for a supply teacher to use.

Preparing for the lesson

- Specific preparation requirements are indicated in the *Preparation* section of the Teachers' Notes. You should always have available copies of the worksheet, pens, pencils and a chalkboard or equivalent.
- Allow approximately an hour's lesson for each page. If there may be too much or too little work for an hour, this is indicated in the *Timing* section of the Teachers' Notes.
- You can link pages to make a double lesson; linkable pages are indicated under the heading *Links*.
- Possible classroom management challenges which may be created by the page are flagged in the Teachers' Notes under the heading *Points To Be Aware Of*, and any issues of a sensitive nature are brought to your attention under *Sensitivity*. You will probably want to check whether these are relevant to your class.

The lesson

Pages are worded so that you can choose how to manage each in the classroom. However, as a general guideline, we suggest that you move from 'introductory chat' to individual work, through to paired or small group discussion, then to pooling ideas as a class. Where a specific approach is required which differs from this, it is indicated in the Teachers' Notes under the heading *Approach*.

Each sheet contains a number of activities. These fall into several basic formats:

- **Thought starters**
- **Oral work**
- **Research**
- **Written work**
- **Reading**
- **Brainstorming**
- **Working in role or 'imagine' exercises**

Where relevant, you may choose to allow students with poor writing skills to work on the sheet and mark, underline or colour to show understanding.

Where extended writing or copying is required, you could modify the task and set a precise target for students who work very slowly, inaccurately or untidily. You may find it useful to mark sections which you expect students to complete with a fluorescent pen. Where a different approach might be more appropriate for less able (or more able) students, this is highlighted under *Differentiation*.

Following up on the lesson

The Teachers' Notes may include, where relevant, suggestions for *Extension Activities*. These are usually designed to carry the topic into a double lesson, or to provide an opportunity for out-of-classroom work.

Teachers' Notes
LANGUAGE COUSINS

Aims This page encourages awareness of the links between European languages, and helps students to develop logical thinking skills.

Classroom Management *Links:* This page could be used in conjunction with two other sheets on language, DO YOU SPEAK CATALAN? and LOAN WORDS.

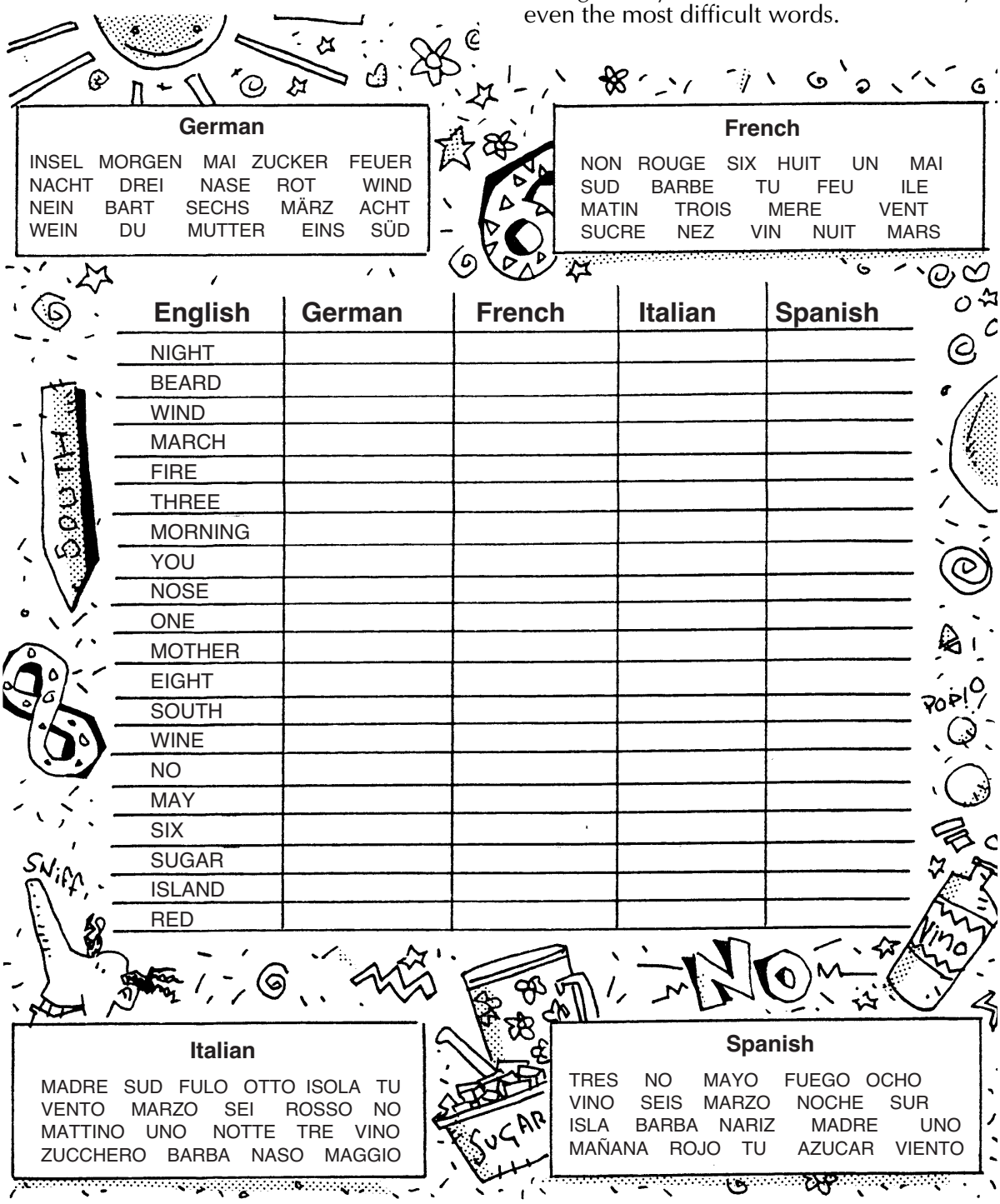
Answers

English	German	French	Italian	Spanish
NIGHT	NACHT	NUIT	NOTTE	NOCHE
BEARD	BART	BARBE	BARBA	BARBA
WIND	WIND	VENT	VENTO	VIENTO
MARCH	MÄRZ	MARS	MARZO	MARZO
FIRE	FEUER	FEU	FULO	FUEGO
THREE	DREI	TROIS	TRE	TRES
MORNING	MORGEN	MATIN	MATTINO	MAÑANA
YOU	DU	TU	TU	TU
NOSE	NASE	NEZ	NASO	NARIZ
ONE	EINS	UN	UNO	UNO
MOTHER	MUTTER	MERE	MADRE	MADRE
EIGHT	ACHT	HUIT	OTTO	OCHO
SOUTH	SÜD	SUD	SUD	SUR
WINE	WEIN	VIN	VINO	VINO
NO	NEIN	NON	NO	NO
MAY	MAI	MAI	MAGGIO	MAYO
SIX	SECHS	SIX	SEI	SEIS
SUGAR	ZUCKER	SUCRE	ZUCCHERO	AZUCAR
ISLAND	INSEL	ILE	ISOLA	ISLA
RED	ROT	ROUGE	ROSSO	ROJO

LANGUAGE COUSINS

Most European languages are 'cousins'. They come from a language called Indo-European which was spoken 5,000 years ago. This language has left its trace in countries as far apart as Iceland and India.

Fill in the grid below with the correct word from each of the language boxes. Start with a language you know something about. It might help you to read the words aloud. As you fill in the grid, patterns will start to emerge and you should be able to identify even the most difficult words.



German

INSEL MORGEN MAI ZUCKER FEUER
NACHT DREI NASE ROT WIND
NEIN BART SECHS MÄRZ ACHT
WEIN DU MUTTER EINS SÜD

French

NON ROUGE SIX HUIT UN MAI
SUD BARBE TU FEU ILE
MATIN TROIS MERE VENT
SUCRE NEZ VIN NUIT MARS

English	German	French	Italian	Spanish
NIGHT				
BEARD				
WIND				
MARCH				
FIRE				
THREE				
MORNING				
YOU				
NOSE				
ONE				
MOTHER				
EIGHT				
SOUTH				
WINE				
NO				
MAY				
SIX				
SUGAR				
ISLAND				
RED				

Italian

MADRE SUD FULO OTTO ISOLA TU
VENTO MARZO SEI ROSSO NO
MATTINO UNO NOTTE TRE VINO
ZUCCHERO BARBA NASO MAGGIO

Spanish

TRES NO MAYO FUEGO OCHO
VINO SEIS MARZO NOCHE SUR
ISLA BARBA NARIZ MADRE UNO
MAÑANA ROJO TU AZUCAR VIENTO

Teachers' Notes
RATS

Aims

This worksheet aims to develop students' awareness of an important aspect of ecology – the extraordinary (by human standards) fertility and mortality of some animal species.

Preparation

Calculators could be used, but are not essential.

Classroom Management

Approach: You could ask students to work out their answers using a table showing the months of the year across the top, and the breeding results of the parents, children and grandchildren below.

Differentiation: The activity is a problem-solving exercise which does not involve any difficult maths. A calculator may be useful when dealing with the larger numbers in the second and third years. Less numerate students may need to be guided more carefully through the process and you may wish to offer these simplified criteria:

1 Each female rat has her first litter at 4 months old (sexually mature at 3 months plus 24 days gestation)
2 Each litter has a maximum of ten young
3 Each breeding pair produces a litter every two months.

These figures assume the maximum possible breeding potential.

NB: It can be assumed that males and females are produced in equal numbers, so that a litter of ten young will produce five breeding pairs.

Answers

Students may apply different methods to solving the problem and therefore arrive at different answers depending on the number of litters per year and the number of young per litter. A typical answer will show one original pair producing over a thousand descendants after one year, half a million after two years and hundreds of millions after three years.

Most rats born in the wild die (up to 99% of the rat population in some years). The main reasons for mortality are predators and lack of food. It has recently been asserted, however, that there are more rats than humans in Britain.

Extension Activities

You could ask students to do the same activity with another species (mice or grouse?). They would need to do some research to find out the breeding patterns of the species before going on to work out their answers.

Alternatively, they could undertake further work on the maths involved. You could ask them to find a way of presenting their results (for example, in a graph, bar chart or table). Very able students may be able to work out a formula which can be applied to the activity.

RATS

Have you ever seen a rat in the wild? Where do rats live? How many rats do you think there are in Britain?

RAT

(Common rat, Rattus norvegicus)

- 30–45cm including tail
- gestation 24 days
- female sexually mature after 3 months
- 3–5 litters per year
- 4–10 young per litter
- predators: stoat, weasel, fox, owls, humans, dogs, cats

Use the information below to help you work out the rate at which rats can breed. If you start with a pair of rats, one male and one female:

1 How many rats will there be after a year?
2 How many will there be after two years?
3 How many will there be after three years?

Don't forget to include the children and grandchildren of the original pair.

What do your results show? Why is the country not overrun with rats? What happens to most rats born in the wild?

Teachers' Notes
LIFE OF AN ATOM

Aims This page provides the stimulus for a piece of creative writing intended to enhance students' knowledge of the principles of the carbon cycle.

Preparation Students should be familiar with the basic principles of the carbon cycle, although it need not have been covered in great depth. Diagrams or notes explaining the cycle might be useful, but are not essential.

Classroom Management *Approach:* Students should be encouraged to think of ingenious ways that carbon atoms could be transferred from one form to another.

Answers These are some of the processes that take place in the carbon cycle:

Plants take in carbon as carbon dioxide during photosynthesis. They release it during respiration. Some carbon remains in the plant. The plant may be eaten by humans or animals, it may rot away into the earth, or become a fossil.

Humans take in carbon by breathing, or eating other animals or plants. They release carbon by breathing, defecation, shedding skin or being bitten by animals or insects. When humans die, carbon is released into the air if the body is cremated, or into the soil if buried.

Carbon in the soil can become part of coal, methane or oil. When these are burned, fumes carry carbon atoms into the air, which can be inhaled by humans or animals, or taken into a plant.

LIFE OF AN ATOM

Is it possible that a little piece of your left ear could once have been part of a dinosaur? Unlikely though it sounds, it could be true. Many things in the natural world contain carbon, including you.

Carbon atoms never die or disappear, they just change from one form to another. What do you know about this process?

A carbon atom could spend some time as part of an animal or human being, and some time as part of a non-living material such as coal or oil.

Think about one of the carbon atoms in your body and write its life story. The pictures below will give you some ideas to start you off. Don't forget to explain how the atom changes from one form to another. Let your imagination run wild – a little piece of you could have been in some very interesting places!