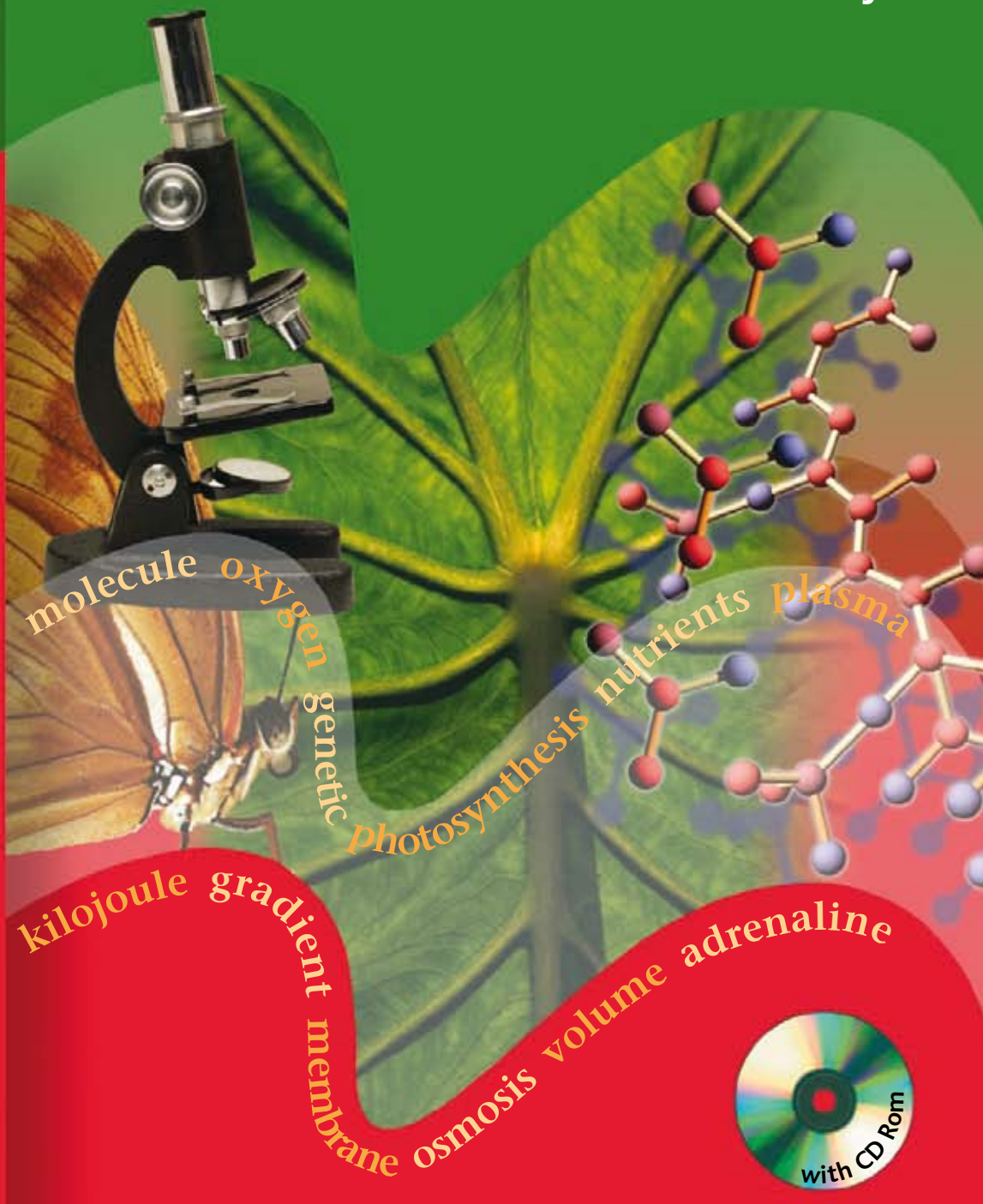
Book information and sample unit

Macmillan Vocabulary Practice Series

with key

Science

Keith Kelly



MACMILLAN

From the author

Dear Reader,

Welcome to the **Macmillan Vocabulary Practice Series – Science**, the first in a series of subject-specific English vocabulary books.

My name is Keith Kelly and I am the author of the Science book in this series. I have been working for the last 15 years in schools where the curriculum is partly or wholly taught through the medium of a foreign language. One major complaint of teachers everywhere is always that the learners "don't know the words." I see this resource as a big step in providing materials for teachers and learners to help them learn the necessary vocabulary for their journey of learning Science through English.

I envisage this resource as a support for the work that goes on in the classroom; where the teacher can direct learners to relevant sections for self-study and also make use of the materials in the classroom. Check out my teaching tips below for some quick ideas.

I hope that you find the Macmillan Vocabulary Practice Series a useful addition to your classroom and that your students will begin to finally know the words that they need!

Best wishes,
Keith

"I see this resource as a big step in providing materials for teachers and learners to help them learn the necessary vocabulary for their journey of learning Science through English."

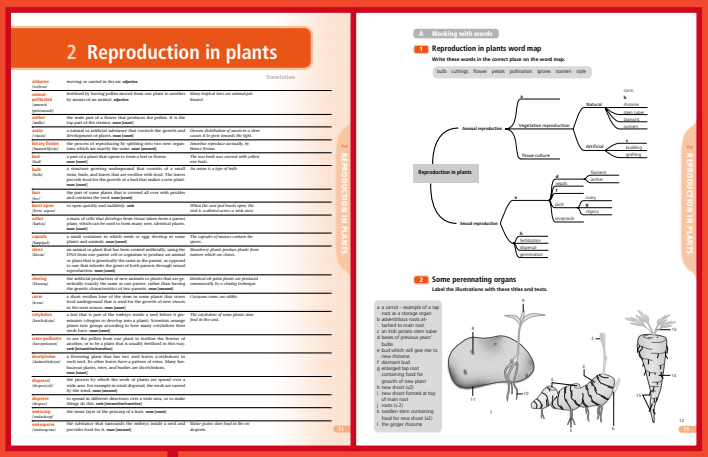
Keith's top tips

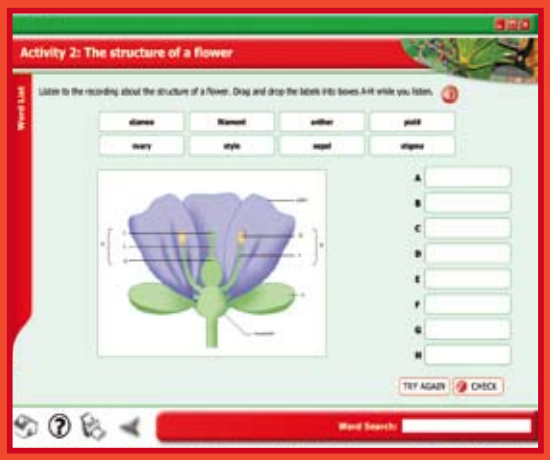
1 **Visuals:**
There is a huge amount of excellent visuals in this book and on the CD-ROM which can be used and exploited in the classroom, especially if you have access to a data projector or white board.

2 **Word activities:**
Macmillan Vocabulary Practice Series - Science easily lends itself to whole class or individual vocabulary work. Create word search activities where all students are working in teams to be the first to find the words from the unit, when given a definition.

3 **Self-study sessions:**
Many schools include self-study time in the curriculum. If it doesn't exist, create time in your class for self study and subject revision. This resource would be ideal for such moments.

"The perfect solution for both the English teacher and the subject specialist"





Key features of the book

- 30 key Science areas
- Vocabulary word lists with easy to understand definitions that use a restricted defining vocabulary
- Contextual sentences to show how and when to use appropriate terminology
- Practice exercises using the vocabulary at word, sentence and text level
- Straightforward diagrams to help understand and practise key terms

Key features of the CD-ROM

- Vocabulary improvement with fun listening activities and interactive games
- Hear the pronunciation of any word with just one click
- Fully searchable vocabulary lists
- Topic word lists that can be personalised and saved
- Word mapping tools that help students to learn via word association
- Diagram bank per topic with all illustrations, with and without labels

Vocabulary Practice Series

Science includes the following topic areas:

- Living organisms
- Reproduction in plants
- Reproduction in humans
- Heredity
- Photosynthesis
- Nutrition
- Health and safety
- Health and disease
- The circulation system
- Digestion in humans
- Respiration
- Transport in plants
- Excretory system
- Locomotion
- Temperature, thermometers and heat transfer
- Coordination in humans
- Energy sources and pollution
- Aquatic and terrestrial environments
- Atoms, elements and compounds
- Electricity and magnetism
- Chemicals
- Metals and plastics
- Forces and motion
- Energy and machines
- Light and sight
- Sound and hearing
- Earth movements
- Atoms elements and compounds
- The solar system

Definitions taken from the Macmillan School Dictionary help to clarify difficult subject specific words.

2 Reproduction in plants

		Translation
airborne /ˈeəˌbɔːn/	moving or carried in the air. **adjective**	
animal-pollinated /ˌænɪməl (pɒləˌneɪtɪd)/	fertilized by having pollen moved from one plant to another by means of an animal. **adjective**	*Many tropical trees are animal-pollinated.*
anther /ˈænθə/	the male part of a flower that produces the pollen. It is the top part of the stamen. **noun [count]**	
auxin /ˈɔːksɪn/	a natural or artificial substance that controls the growth and development of plants. **noun [count]**	*Uneven distribution of auxin in a stem causes it to grow towards the light.*
binary fission /ˌbaɪnərɪˈfɪʃ(ə)n/	the process of reproducing by splitting into two new organisms which are exactly the same. **noun [uncount]**	*Amoebae reproduce asexually, by binary fission.*
bud /bʌd/	a part of a plant that opens to form a leaf or flower. **noun [count]**	*The rose bush was covered with yellow rose buds.*
bulb /bʌlb/	a structure growing underground that consists of a small stem, buds, and leaves that are swollen with food. The leaves provide food for the growth of a bud that makes a new plant. **noun [count]**	*An onion is a type of bulb.*
burr /bɜː/	the part of some plants that is covered all over with prickles and contains the seed. **noun [count]**	
burst open /ˌbɜːst əʊpən/	to open quickly and suddenly. **verb**	*When the seed pod bursts open, the seed is scattered across a wide area.*
callus /ˈkæləs/	a mass of cells that develops from tissue taken from a parent plant, which can be used to form many new, identical plants. **noun [count]**	
capsule /ˈkæpsjuːl/	a small container in which seeds or eggs develop in some plants and animals. **noun [count]**	*The capsules of mosses contain the spores.*
clone /kləʊn/	an animal or plant that has been created artificially, using the DNA from one parent cell or organism to produce an animal or plant that is genetically the same as the parent, as opposed to one that inherits the genes of both parents through sexual reproduction. **noun [count]**	*Strawberry plants produce plants from runners which are clones.*
cloning /ˈkləʊnɪŋ/	the artificial production of new animals or plants that are genetically exactly the same as one parent, rather than having the genetic characteristics of two parents. **noun [uncount]**	*Identical oil palm plants are produced commercially by a cloning technique.*
corm /kɔːm/	a short swollen base of the stem in some plants that stores food underground that is used for the growth of new shoots in the next season. **noun [count]**	*Cocoyam corms are edible.*
cotyledon /ˌkɒtɪˈliːd(ə)n/	a leaf that is part of the embryo inside a seed before it germinates (=begins to develop into a plant). Scientists arrange plants into groups according to how many cotyledons their seeds have. **noun [count]**	*The cotyledons of some plants store food in the seed.*
cross-pollinate /ˌkrɒsˈpɒləˌneɪt/	to use the pollen from one plant to fertilize the flowers of another, or to be a plant that is usually fertilized in this way. **verb [intransitive/transitive]**	
dicotyledon /ˌdaɪkɒtɪˈliːd(ə)n/	a flowering plant that has two seed leaves (cotyledons) in each seed. Its other leaves have a pattern of veins. Many herbaceous plants, trees, and bushes are dicotyledons. **noun [count]**	
dispersal /dɪˈspɜːs(ə)l/	the process by which the seeds of plants are spread over a wide area. For example in wind dispersal, the seeds are carried by the wind. **noun [uncount]**	
disperse /dɪˈspɜːs/	to spread in different directions over a wide area, or to make things do this. **verb [intransitive/transitive]**	
endocarp /ˈendəʊkɑːp/	the inner layer of the pericarp of a fruit. **noun [count]**	
endosperm /ˈendəʊspɜːm/	the substance that surrounds the embryo inside a seed and provides food for it. **noun [uncount]**	*Maize grains store food in the endosperm.*

An example of the word in context gives clues as to where the vocabulary might be found and how it is used.

The International Phonetic Alphabet helps students and teachers with the pronunciation of new subject related vocabulary.

Working with vocabulary

Pronunciation of all words can be listened to on the CD-ROM.

SAMPLE PAGE

2 REPRODUCTION IN PLANTS

Definitions also include reference to parts of speech.

		Translation
spore /spɔː/	a structure consisting of one cell that is produced, for example, by a fungus, moss, or fern, and that can develop into a new organism of the same type. **noun [count]**	
sprout /spraʊt/	if a plant sprouts, or if it sprouts something, new leaves or shoots begin to grow on it. **verb [intransitive/transitive]**	
stalk /stɔːk/	a long thin part of a plant with a flower, fruit, or leaf at the end. **noun [count]**	
stamen /ˈsteɪmən/	the male part of a flower that produces pollen. It consists of an anther and a filament. **noun [count]**	
stem /stem/	the long part of a plant that the leaves and flowers grow from. **noun [count]**	
stem tuber /stem tjuːbə/	the swollen part of a plant such as a potato, that grows underground, stores food, and produces new plants. **noun [count]**	
sticky /ˈstɪkɪ/	made or covered with a substance that sticks to other things. **adjective**	*The tree produces sticky buds in spring.*
stigma /ˈstɪgmə/	the female part of a flower that receives pollen. **noun [count]**	
stock /stɒk/	a living plant onto which a bud or twig of another plant (a scion) is grafted. **noun [count]**	*The stock is prepared for the graft by making a cut in the bark.*
stolon /ˈstəʊlɒn/	a side stem that grows horizontally underground, and can start new roots and a new plant. **noun [count]**	
style /staɪl/	a long thin part of the carpel of a flower, at the top of which is the stigma. **noun [count]**	
sucker /ˈsʌkə/	a plant that grows from the bottom of another plant's stem or roots. **noun [count]**	*Banana and pineapple produce new plants from suckers.*
tap root /ˈtæp ˌruːt/	the main straight root of a dicotyledon plant that has smaller roots growing out from its sides. Some vegetables, for example carrots, are taproots. **noun [count]**	
testa /ˈtestə/	the hard layer that covers and protects the seed of a plant that produces flowers (plural: testae /testiː/). **noun [count]**	
tissue culture /ˈtɪʃuː ˌkʌltʃə/	**1** the process of growing tissue cells taken from an organism in a culture medium (=substance that helps something to grow) for medical or scientific purposes. **noun [uncount]** **2** an amount of tissue grown in a culture medium. **noun [count]**	*Oil palm plants are produced by a technique called tissue culture.*
tropism /ˈtrəʊpɪzm/	the movement of part of a plant in a particular direction as it grows. **noun [count/uncount]**	*Examples of tropism include growth towards light (phototropism) and growth towards water (hydrotropism).*
unisex /ˈjuːniseks/	containing only the male or female reproductive structure. **adjective**	*The coconut is a unisex flower.*
vegetative reproduction /ˈvedʒətətɪvˌriː prəˈdʌkʃ(ə)n/	reproduction in which part of the parent plant gives rise to new plants, which can occur naturally or by artificial methods. **noun [uncount]**	
wind-pollinated /ˈwɪnd pɒlɪˌneɪtɪd/	the pollination of flowers or cones by pollen that is blown by the wind from other flowers or cones of the same type. **noun [uncount]**	*Wind-pollinated flowers do not produce nectar.*
yeast /jiːst/	a single-cell fungus that reproduces by budding, and that can convert sugar into alcohol and carbon dioxide. **noun [count/uncount]**	*Yeast is used in bread-making and brewing.*
zygote /ˈzaɪgəʊt/	a fertilized egg in living things that have sexual reproduction. **noun [count]**	*When the pollen cell nucleus and egg cell nucleus fuse together a zygote is formed which develops into a seed.*

Free space to allow students to write their own example or translation.

Students can use the topic vocabulary lists on the CD-ROM to create their own word maps. These can then be saved and edited.

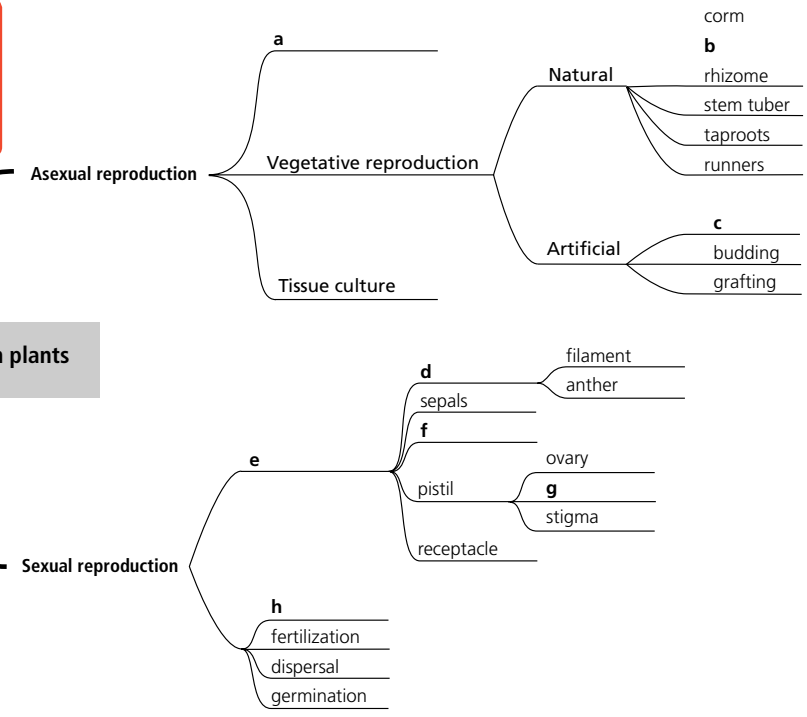
A Working with words

1 Reproduction in plants word map

Write these words in the correct place on the word map.

bulb cuttings flower petals pollination spores stamen style

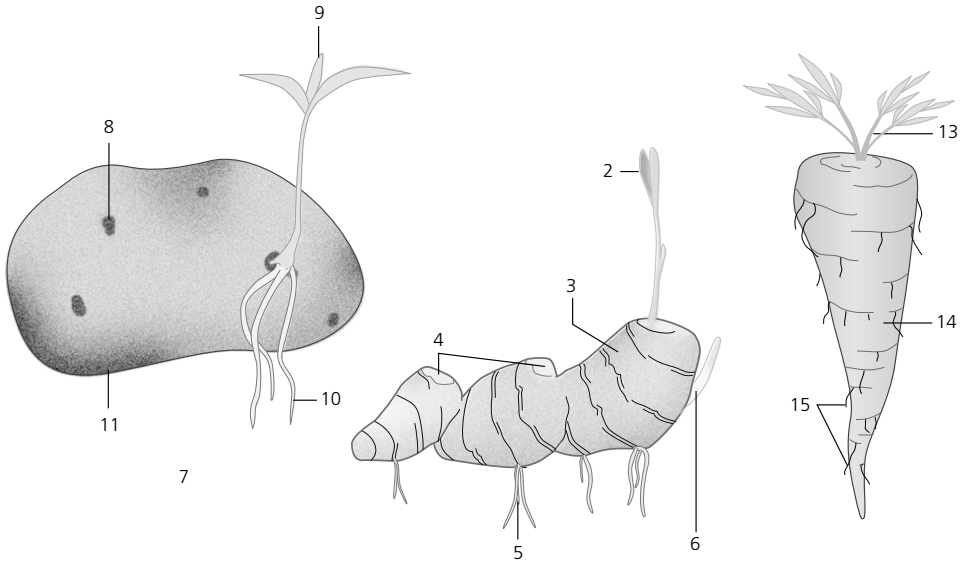
Word map activities aid students in making connections between word sets. They also give a visual representation of word systems.



2 Some perennating organs

Label the illustrations with these titles and texts.

a a carrot – example of a tap root as a storage organ
b adventitious roots attached to main root
c an Irish potato stem tuber
d bases of previous years' bulbs
e bud which will give rise to new rhizome
f dormant bud
g enlarged tap root containing food for growth of new plant
h new shoot (x2)
i new shoot formed at top of main root
j roots (x 2)
k swollen stem containing food for new shoot (x2)
l the ginger rhizome

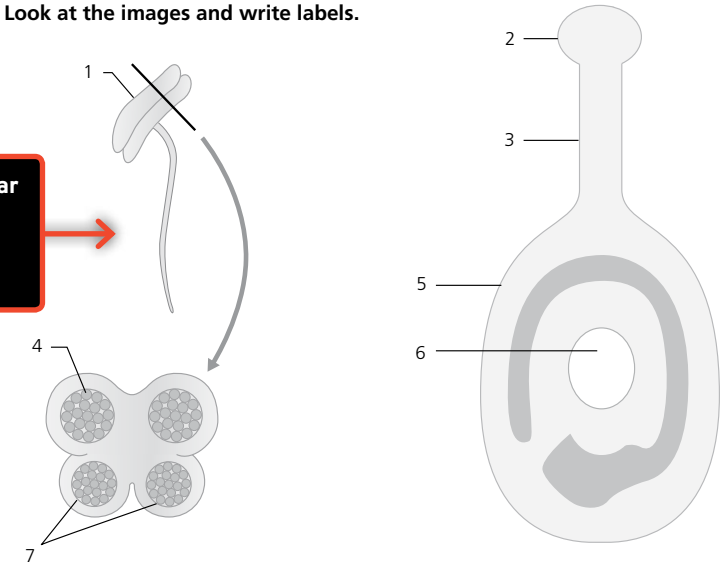


Activities in section A contain exercises that work with vocabulary on a single word basis to ensure understanding.

3 Reproductive structures in flowers

Look at the images and write labels.

Diagrams are clear and simple to aid subject matter comprehension.



4 Artificial methods of vegetative reproduction of plants

Fill the gaps with these words.

cuttings hormones plants potato roots soil technique types

1 Farmers and gardeners often use different _____ of artificial asexual reproductive techniques to increase the plants that they grow.
2 They choose high-quality _____ that grow well and reproduce them asexually so that they have more high-quality plants.
3 Some of these techniques are _____, budding and grafting.
4 Taking cuttings is a very simple _____ commonly used with hardwood plants such as sugar cane, cassava and hibiscus.
5 It involves cutting a leafy branch or stem through at an angle and placing it in _____ which contains lots of air.
6 The branch must be watered daily until _____ develop at the cut end of the stem.
7 Some people use plant _____ to encourage root growth.
8 Softwood plants such as sweet _____, cactus and Joseph's coat can also be grown from cuttings.

5 Fruit and seed dispersal

Complete the sentences by underlining the correct words.

1 The importance of fruit is in the (collection / dispersal / falling) of seeds.
2 If seeds (hang / fly / drop) beside the parent plant and germinate there, they will be competing with the parent for water, light and nutrients.
3 However, if they are carried some distance, there is a better chance of getting the (conditions / partitions / fractions) they need for germination and good growth.
4 Seeds are dispersed by different (times / places / methods), depending on the adaptations of the fruit.
5 This is often with the assistance of (superior / internal / external) agents, such as animals, water and wind.

Section B looks at using new vocabulary in sentences to ensure comprehension and correct formation in a greater language context.

B Working with sentences

6 Differences between wind-pollinated and insect-pollinated flowers

Read the sentences and write them into the correct space in the grid.

Activities that are set within a specific context yet allow language manipulation and construction are given within controlled parameters.

… have feathery stigmas to catch airborne pollen grains.
… are generally directed upwards.
… hang down.
… produce a large amount of pollen.
… have large, brightly coloured petals.
… are odourless and produce no nectar.
… have relatively large pollen grains with a rough or sticky surface.
… have small, light and smooth pollen grains.
… produce a relatively small amount of pollen.
… have rigid and smooth stigmas, which are sticky at the tip.
… have stigmas and anthers which hang outside the flower for easy shaking in the wind.
… have stigmas and anthers which are usually inside or partly enclosed in the flower.
… have sweet scented flowers which usually produce nectar.
… are usually small with small petals that are not very conspicuous.

Characteristics	Insect-pollinated flowers …	Wind-pollinated flowers …
Petals		
Nectar production		
Direction of flowers		
Location of stigmas and anthers		
Stigmas		
Amount of pollen		
Pollen grains		

7 Natural vegetative propagation

Match these words with the correct paragraphs.

tap roots stolons stem tuber runners root tubers rhizome corm bulb

1 _____ – a short, swollen, underground stem that grows vertically and is usually covered with papery leaves. The stem produces buds at the top, which give rise to the new shoots in the wet season, and roots that form on the lower surface.

2 _____ – a modified underground stem that is totally surrounded by large fleshy and scaly leaves. The fleshy leaves are the storage organ, and they are protected by outer dry scaly leaves. Onion and garlic are examples. The new plant develops from the terminal bud or from one or more lateral buds.

3 _____ – an underground swollen stem. It grows horizontally and has scaly leaves. The stem is firmly held in the soil by adventitious and contractile roots that form underneath the horizontal stem. Terminal buds give rise to new plants. As the plants produce food, they pass it down. Buds on the side may grow to form new lateral growths. Ginger, butterfly lily, Canna and arrowroot are examples.

4 _____ – the enlarged tip of an underground stem. Buds or 'eyes' appear at nodes or depressions where the leaves used to be. Under good conditions, one or more buds will sprout new plants. Irish or English potato is an example.

Section C includes reading practice with comprehension or writing activities.

5 _____ – the sweet potato and cassava, are fibrous adventitious roots that become enlarged with food reserves. These fleshy enlarged roots serve as the storage organ, which provides the nutrients for the new shoot that arise from a bud.

6 _____ – carrots and turnips are examples of enlarged roots which contain stored food. The new shoot develops at the top.

7 _____ – natural methods of vegetative reproduction which are not storage organs. They are weak stems that grow horizontally above ground. They form roots and a shoot at their nodes. The root grows downwards to the soil which provide water and nutrients for the shoots to grow and become independent. The strawberry and water grass are the names of plants that reproduce asexually by sending these out.

8 _____ – natural methods of vegetative reproduction which are not storage organs. They are weak stems that grow horizontally below ground. The new, young plants receive food from the parent plant until they are able to make enough of their own to become independent.

C Working with texts

8 More on seed dispersal

Below is a text on ways of seed dispersal. The sentences are all jumbled up. Read the text. Then put the information about the two ways of seed dispersal in the correct columns.

Seed dispersal

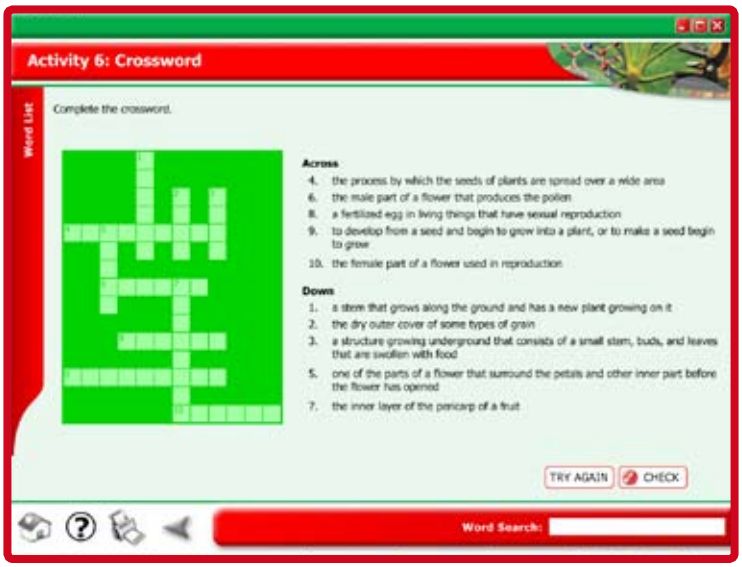
Some seeds are dispersed by water. Other plants, such as the legumes, have a built-in mechanism that allows seeds to be scattered when the fruit suddenly bursts open when dry. Coconuts are the best known seeds that are dispersed by water. They have a buoyant husk which is the mesocarp of the fruit. As the fruit dries in self-dispersing plants, tension builds up in parts of the seed coat until it splits. Seeds with a buoyant husk can float long distances by sea before they are washed up onto the shore. Self-dispersing fruit split with a sudden 'explosion' which scatters the seeds quite widely. The waterproof epicarp of coconuts, the skin of the fruit, prevents them from becoming waterlogged during their journey.

Fruits dispersed by water	Self-dispersing seeds
1	5
2	6
3	7
4	

Section C uses diagrams and tasks that have more complex texts to give practice in both the use of vocabulary and ensure understanding of the overall context.

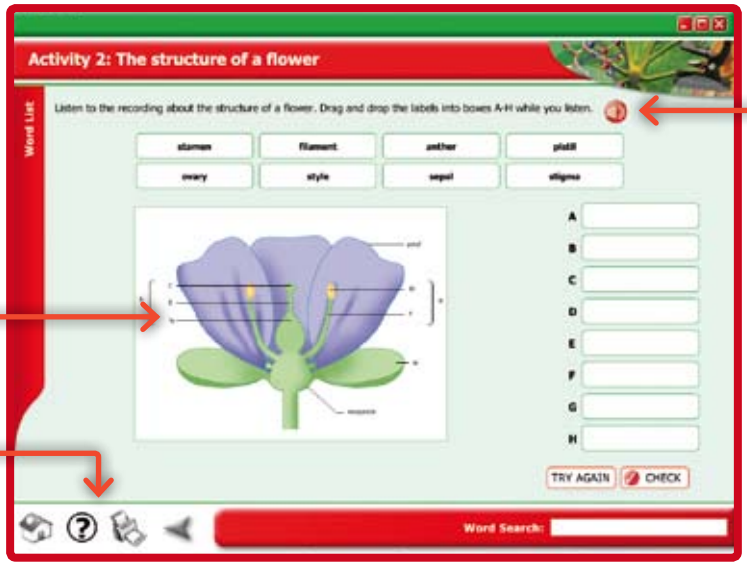
CD-ROM extras!

Click on the tab to reveal the thematic word lists.



Activities that improve vocabulary at word level.

Diagrams and visual representations can also be found in the diagram bank.



Opportunities to listen to the vocabulary are given within the activities.

Clear and obvious picture symbols help to guide students to useful functions.

Activities are also available that help improve understanding of the vocabulary at sentence and text level.

Full search function on every screen.

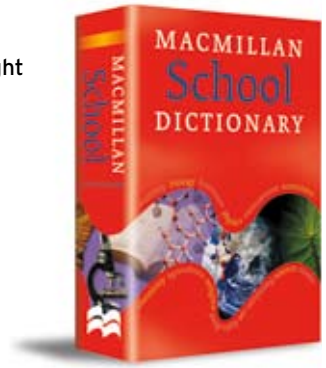
A world of CLIL material

Macmillan School Dictionary

A two-colour dictionary perfect for Intermediate level students whose curriculum subjects are taught through the medium of English.

Key features

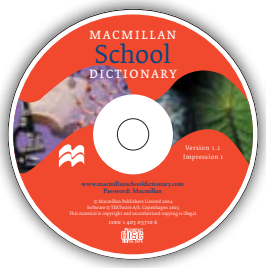
- Strong curriculum focus
- Based on the World English Corpus and the Macmillan Curriculum Corpus
- Plenty of language help
- Easy to use
- Special study skills sections
- Clear illustrations and diagrams



Macmillan School Dictionary CD-ROM

The CD-ROM combines the Macmillan School Dictionary with

- pronunciation practice
- Activities and games
- Sound effects and animations
- A fully searchable compendium of curriculum vocabulary online

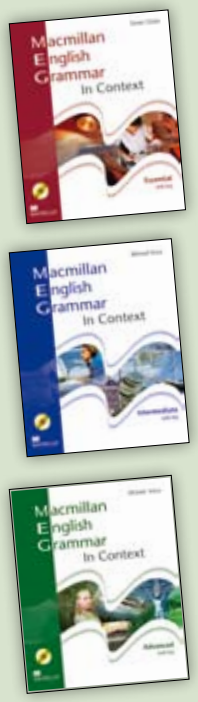


Macmillan English Grammar In Context

An innovative three level grammar practice series. The first grammar series to incorporate contextual examples into grammar practice activities, *Macmillan English Grammar In Context* is a grammar book that can be used in both the classroom and for self-study.

Key Features

- Grammar explanation with standard practice activities and contextual example
- Cross-curricular content areas include: literature, science, geography, history and social science
- **CD ROM** contains unit-by-unit interactive material and a fully searchable glossary

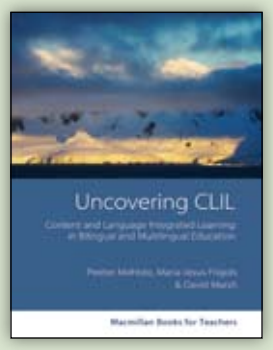


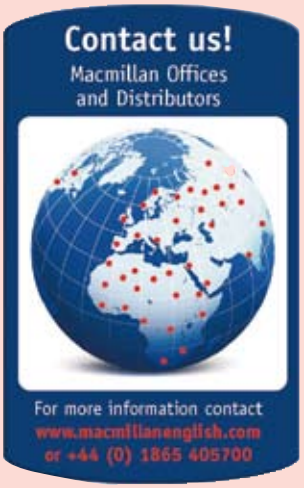
Uncovering CLIL

An ideal guide for teachers getting started in CLIL and existing practitioners in search of new ideas.

Key Features

- Broad overview for primary and secondary level teachers
- Range of practical ideas and activities





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