Making use of the Help notes

Elicit the meaning of **chaos** from the students. Ask them to suggest some possible sentences using the word **chaos**. If you have any physicists or mathematicians among your students, they may point out that **chaos** also has a more specialized meaning. Look at the two example sentences with the students: is the meaning of **chaos** exactly the same in each? And if not, what is different about the second one? If they are unable to answer this precisely, ask them to look up **chaos** in the dictionary (or see below on the worksheet) and read the HELP note.

In physics, **chaos** is not actually random – it only *appears* to be so because it is extremely complex and unpredictable, because small changes in conditions can have very large effects. This is a different – and more specialized – meaning than the general meaning. It is important for students to be aware of when a word is used with a specialized meaning in a particular discipline; it may even mean that you shouldn't use the general meaning in that discipline. This may partly depend on whether the specialized meaning is quite distinct (and you can also use the general meaning, when that is what you mean) or if it is really a more precise version of the general meaning (in which case, using the less precise, more general meaning may be confusing).

Elicit the general meaning of **coherent** from the students. Ask if any of them knows what it can mean in physics. If not, get them to look at the entry and explain. If they don't know what 'in phase' means, suggest they look at the example sentence, which actually gives two paraphrases of 'coherent/in phase', each less technical than the one before (*synchronized/they go up and down together*).

1 This exercise is all about more precise *uses* of words with more general meanings in particular disciplines; the answers will all be found in the HELP notes at the general meanings. Stress to students that this isn't about learning new vocabulary (these words may not be relevant to their own discipline). Instead it is about practising their study and research skills.

This activity could be organized as a quiz, with pairs or teams of students working together to find the answers to the questions first. If students don't have their own copies of the dictionary, you could copy the relevant entries and post them around the room for students to walk around and find.

a An **inactive** disease is present but shows no symptoms.

b In biology, a **trait** is specifically a characteristic that has been passed down from the parents in the genes. In general academic English, however, **trait** can just be used as a synonym for **characteristic**, whether it is genetic or not.

c *Conventional agriculture uses **synthetic/artificial** fertilizers, pesticides and genetic engineering to subdue nature.*

In scientific language, **chemical** describes any substance considered in terms of its atoms and molecules, whether it is industrially produced or naturally occurring. To exclude

naturally occurring chemicals, it is better in this context to use the term **synthetic** or **artificial**.

d Either an increase in the birth rate or an increase in life expectancy could increase a country's **dependency** ratio, because these would increase the number of people under the age of 18 or over the age of 64, relative to the working population. (Alternatively, an epidemic or disaster that killed large numbers of working-age people, but not so many young/elderly, would have the same effect.)

e The **populations** are the groups of people being studied in each case; we know they are people because of the word *demographic*, which relates to sense 1 of **population** (which is about people). A statistical population does not have to be made up of people, or even animals: it can be any group of items under study. *Demographic differences* might include things like age and occupation; the second example sentence at **demographic**[1] offers several more: level of education, marital status, presence of children, religious belief.

f In ecology, **strategies** enable plants and animals to survive and be successful in their environment. The correct verb to use is **evolve**, which means to develop gradually, especially from a simple to a more complicated form. If you say *Some plants have developed strategies* … you will probably get your meaning across, but it does unfortunately suggest plants getting around a meeting table and planning what they are going to do! **Evolve** makes it clear that, although we are calling these 'strategies', there is no planning involved. It is more precise scientific language.

2 This exercise is about avoiding grammar/uses that are too informal or not appropriate in academic English (or in students' academic assignments). Help notes give guidance on these issues too. It is worth encouraging students to look at the sentences first before checking in the dictionary: they may be able to correct some of these for themselves.

a *These* **data** *suggest* that vegetation changes can occur rapidly.
Except in the computing sense, **data** are always plural in academic English. (General English – and computer science – are less concerned about this point.)

b American English is significantly **different** *from* British English.
different to is used in more informal British English; *different than* in more informal American English. Both are best avoided in academic writing.

c Gore **acted** *as if/as though* he and Bush had no significant disagreement on this issue.
act like + noun is fine (*He acted like a statesman*.) but before a clause you need *as if/as though* in formal written English.

d *In addition/Furthermore/Moreover,* the sugar colonies were a vital part of the economy.
Besides used at the beginning of a sentence is a little too informal for most types of academic writing (although you can use it in speech).

e *As will be demonstrated later*, these two theories are closely related.
There are alternative ways of expressing this; the important point is to avoid the slightly patronising use of **we** – the passive is a good way of doing this.

f *Here* is a further example of what this means.
or simply *A further example is* …
Let me, like **we** above, is a further example of a style that is more appropriate in a textbook than a student assignment (although it is fine in a student presentation).

3 This is a challenging exercise but does not require any knowledge of biology beyond very general knowledge about evolution. The difficult vocabulary is explained in the dictionary.

Ask students to read the definition of **species**. Ask if any of them can explain or guess what a **gene pool** is. They might need help with this from the entries for **gene** and the Help note on **gene pool** at **pool**[1] *noun* sense 2. Students work in pairs to rewrite the definition of **species** in their own words. Encourage them to look at the definitions of **viable** and **fertile** but resist the temptation to look at the dictionary definition of **species** at this stage. They may produce a definition of **species** that is something like this:

> *A group of animals or plants that share genes from the same larger set and can breed with each other to produce healthy offspring/young which are also capable of breeding.*

Now ask the students to compare the definitions they have written with the definition from the textbook and the definition of **species** in the dictionary. Discuss some of the following questions:

- Which of the definitions is the most technical? Which is the most precise?
- What difficulties did they encounter in paraphrasing the technical terms? (e.g. 'genes from the same larger set' is a rather clumsy attempt to convey what 'gene pool' expresses very precisely)
- How does the detail and language of the dictionary definition vary? Why might this be?

Answers to the last question might cover the following points:

- The different texts and definitions are aimed at slightly different groups of readers, with different aims in mind.
- The dictionary definition is aimed at all students, not just biologists, so it needs to use language and ideas that will be familiar.
- The textbook is aimed specifically at biology students who need a more precise definition and also need to learn the correct scientific language for writing about biology.
- Students will sometimes need to show they understand the specialist terms and concepts in their own discipline by paraphrasing them in their own words.

4 Read the first sentence of the longer extract with the students. Ask one group of students to look up **competition** in the dictionary, a second group to look up **spectrum** and a third to look up **niche**. Encourage them to read the whole entry, not just the first sense that seems to fit. Ask them to identify which dictionary sense of each word is being used in this text, and explain to the class what its meaning is in context. In each case they should say whether this is a specialist word in biology (**niche** – sense 2 in the dictionary), a general academic word with a specialist meaning in biology (**competition** – sense 3) or a general academic word (**spectrum** – sense 3). You may need to explain what is meant by a 'realized niche'. This is the position or role that a living thing actually takes within its community (see **realize** sense 3); it is contrasted with the 'fundamental niche' which is the role it might take if there were no competition.

If you have science students in your class, you could ask them to predict what they think the result might be of intense competition leading to a small realized niche: how might this influence the way a species evolves? Non-scientists may need to work on the rest of the text

first before they are able to answer this. However, students who have read and understood the gist of the text should be able to summarize it in a sentence or two: individuals in a species who are best adapted to make use of the available resources are the most likely to reproduce and pass on their genes and characteristics to the next generation.

Students then work on the rest of the **bold** words in pairs or groups – you could assign different sections of the text to different groups – looking them up in the dictionary, and completing the table.

specialist word in biology	**general academic word with a specialist meaning in biology**	**general academic word**
niche 2 gene pool morphological	competition 3 selection 4	spectrum 3 population 2 specialized 3 adapt 2

You could argue about **morphological** – it is used across the sciences, not just in biology, but (apart from the specialist meaning in linguistics) it is not used in non-scientific disciplines, so is not really a 'general academic word'.

Practice

5 Students can choose their own texts for this exercise, or you can select one that you have studied in class, but it is probably most valuable at this stage if students are working with texts in their own discipline, where most of the vocabulary is already familiar to them. The purely specialist terms may not all be included in the dictionary. You could ask students to explain these terms for themselves or say what they could do to check the meaning of these terms.

Making use of the Help notes

Read these two example sentences: what do you think **chaos** means? Is there any difference in its meaning in the two sentences?

The political landscape was characterized by chaos and confusion.
A great example of a non-linear system exhibiting chaos is all around you: the weather.

Now look up the entry for **chaos** in your dictionary.
In physics, is **chaos** random? What causes it?

Some words have very precise meanings in a particular field of study. Sometimes this meaning is quite distinct from all other meanings of the word. It will usually appear near the end of the entry and have a label to show what field of study it belongs to. See meaning 4 of **coherent** in this entry, used in physics.

co·her·ent AWL /kəʊˈhɪərənt; *NAmE* koʊˈhɪrənt/ *adj.*
1 (of an argument, theory, statement or policy) logical and well organized; easy to understand and clear: *These ideas have yet to be developed into a coherent theory.* ◇ *a coherent account/narrative* ◇ *a coherent strategy/approach* ◇ *The aim is to synthesize the existing research into a coherent framework.* OPP INCOHERENT (1) **2** (of a person) able to talk and express yourself clearly; showing this: *Anxious people become more coherent when put at ease.* ◇ *The stroke left him incapable of coherent speech.* OPP INCOHERENT (2) **3** made up of different parts that fit or work well together: *She organized the different parts of the story into a coherent whole.* ◇ *Under Constantine, the scattered and often unmarked places were reshaped into a coherent 'holy land'.* **4** (*physics*) (of waves) in PHASE with each other: *Light from a laser is coherent and all the waves are synchronized: they go up and down together.* OPP INCOHERENT (3)

Sometimes the specialist meaning is closely related to a more general meaning and it is just more precise. In these cases, a HELP note within the general sense will explain the particular usage within that subject area, as with **chaos**.

found a flourishing home in the US. HELP In physics, **chaos** is the property of a complex system whose behaviour is so UNPREDICTABLE that it appears RANDOM, especially because small changes in conditions can have very large effects. **Chaos theory** is the branch of mathematics that deals with these complex systems: *The study of chaos and complexity has become a subculture within science.*

1 Find the answers to these questions about meanings in particular subject areas. In each case, you will find the answer within a HELP note at one of the senses of the word in **bold**.

a What characterizes an **inactive** disease?

b In biology, why is **trait** a more precise term than 'characteristic'?

c How could you improve the scientific language of this sentence?
*Conventional agriculture uses **chemical** fertilizers, pesticides and genetic engineering to subdue nature.*

d Suggest two possible factors that could increase a country's **dependency** ratio.

e What is the exact meaning of **populations** in this sentence? Suggest some things that the 'demographic differences' might be.
When comparing the populations in the two studies, there are some interesting demographic differences.

f In ecology, what do **strategies** enable plants and animals to do? What is the correct verb to use to talk about how plants and animals come to have these strategies? What exactly does it mean?

2 Some Help notes are not about particular fields of study; instead, they draw attention to differences between academic English and general English. Read the sentences below and identify something in each that you would change for an academic written assignment. Use the Help notes at the words in **bold** to help you.

a This **data** suggests that vegetation changes can occur rapidly.

b American English is significantly **different** to British English.

c Gore **acted** like he and Bush had no significant disagreement on this issue.

d **Besides**, the sugar colonies were a vital part of the economy.

e As **we** shall see in our discussion, these two theories are closely related.

f **Let** me give a further example of what this means.

3 Read this short extract from a biology textbook and use your dictionary to help you answer the questions that follow.

> The basic unit in biology is the species, defined … as individuals sharing a common gene pool and able to produce viable fertile offspring.

SOURCE: Beeby, A. and Brennan, A.-M. (2007). *First Ecology: Ecological Principles and Environmental Issues.* Oxford: Oxford University Press

a What is a **gene pool**?

b Rewrite the definition of **species** in less technical language, if possible without using the terms **gene pool**, **viable** or **fertile**.

4 Read this further extract from the same textbook. Check the words in **bold** in your dictionary and add them to the table below.

> Under severe **competition**, a species may only use a very narrow part of a resource **spectrum** and have a small realized **niche**. Then **selection** will be intense, favouring those individuals able to make best use of what is available. These will be the most successful reproducers and will soon dominate the **population** and **gene pool**. In this way, a species becomes highly **specialized**, often showing distinct **morphological** or other changes that **adapt** it to use a resource most effectively.

SOURCE: Beeby, A. and Brennan, A.-M. (2007). *First Ecology: Ecological Principles and Environmental Issues.* Oxford: Oxford University Press

specialist word in biology	**general academic word with a specialist meaning in biology**	**general academic word**
niche 2	competition 3	spectrum 3

Practice

5 Choose a short text from your own discipline and pick out 6-8 vocabulary items that you can classify as specialist words in your discipline, general academic words with a specialist meaning in your discipline, or general academic words used in your discipline.