UNIT 3

Machines, cycles, and processes

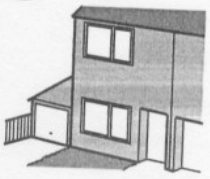
Unit aims

Task 1	Task 2
The passive	Using *which* to organize information
Sequencing	Expressing result and purpose

Task 1 The passive

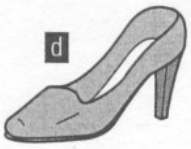
a

b

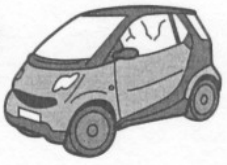


c

d



e



1 Look at the five objects a–e and answer the questions.

a Which materials are used to make these objects?

b Which of the materials in your list are natural and which are manufactured?

2 Natural processes are often described using the active form, whereas manufacturing processes are usually described using the passive. Read the examples. Then complete 1–6 with the correct forms of the verbs in brackets.

Examples

A river *flows* from its source to the ocean. (active)
Many electronic goods *are manufactured* in Japan. (passive: *be* + past participle)

Limestone is the main ingredient of cement. Firstly, it [1] ..... (extract) from the ground. Then, at the factory, it [2] ..... (heat) to a high temperature with other ingredients. After this, it [3] ..... (cool) with blasts of cold air.

When warm air [4] ..... (reach) high ground, it is forced to rise, and, as a result, it [5] ..... (cool). Moisture in the air [6] ..... (condense) to form rain.

Technique

When describing processes, show that you can use active and passive forms where appropriate.

3 When describing processes, make sure the subject and verb agree. Read the example, then complete 1–8 with the correct forms of the verbs in brackets.

Example

The sun *shines* and the temperature *rises*.

Some rock formations [1] ..... (hold) large amounts of water. When it [2] ..... (rain), the tiny spaces in the rock gradually [3] ..... (fill) with water so that the rock [4] ..... (become) saturated. The top of this saturated zone is called the water table. If long periods of rain [5] ..... (occur), the water table [6] ..... (rise). If there is no rain, the rock [7] ..... (begin) to dry out and the water table [8] ..... (fall).

4 Verbs which require an object are called transitive. Verbs which never have an object are called intransitive. Are the verbs in sentence a–c transitive, intransitive, or both? Which sentence cannot be put into the passive?

a The temperature *falls*.
b Manufacturers *make* rubber products.
c Sunlight *opens* the leaves. The leaves *open*.

5 Put each verb in the box into the correct list: transitive, intransitive, or both.

~~fall~~	design	produce	rise	send	begin	manufacture
obtain	die	become	dry	grow	cool	

Transitive:
Intransitive: fall
Both:

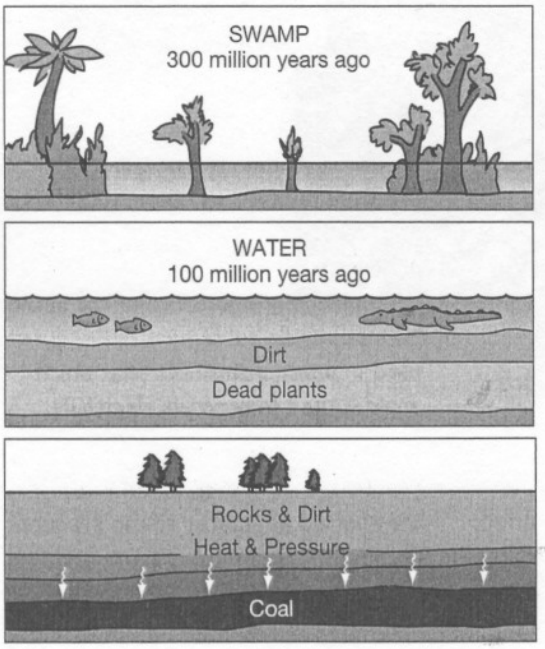
6 Use the notes below to write short paragraphs about production processes.

Example

The production of a car involves various stages. car/design; prototype/make; car/mass-produce; car/distribute; car/sell
After the car is designed, a prototype is made and the car is mass-produced. The car is then distributed and sold.

a The production of a motorcycle involves various stages. motorcycle/design; prototype/make; prototype/test; motorcycle/manufacture; motorcycle/export; motorcycle/sell.
b The diagram shows the various stages in the production of bread. wheat/plant; crop/harvest; wheat/transport to the mill; wheat/make flour; flour/buy/baker; bread/bake; bread/sold.

7 Some diagrams require descriptions using past tenses. Complete the paragraph with the verbs from the box.



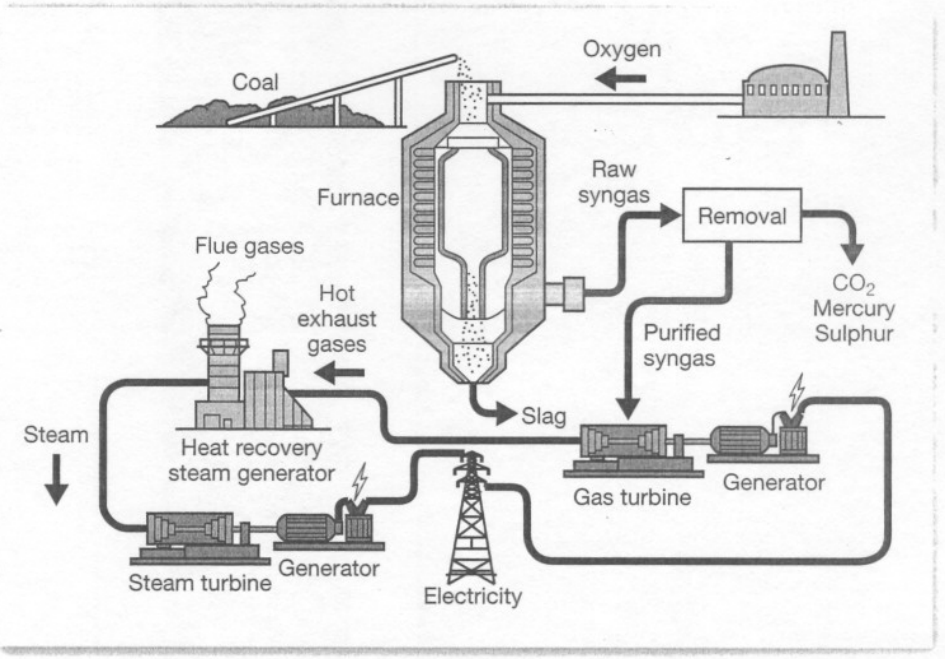
a died and dropped	b was formed
c lived	d was covered
e was trapped	
f turned	g is now mined
h built up	

The diagrams show the process by which coal [1] ..... over a period of millions of years. First of all, large plants [2] ..... in enormous swamps a long time ago. These [3] ..... to the bottom of the water. Over the years, the dead plants formed a layer, which became deeper and deeper. More and more earth and dirt [4] ..... on top of this layer. Subsequently, this layer [5] ..... by rocks and dirt, and so the energy of the dead plants [6] ..... underneath. As the pressure and the heat grew over time, the layer of dead plants [7] ..... into coal. Seams of coal were formed, and coal [8] ..... .

Sequencing

8 The diagram shows how energy is produced from coal. Answer the questions.

a How is the coal carried to the power plant?
b What is added to the furnace in addition to coal?
c What gas is produced when coal is burnt in the furnace?
d What do you think is removed from the gas?
e What is the gas called following this process?
f What do you think the gas does in the turbine?
g What does the turbine do to the generator?
h Where do the hot exhaust gases come from?
i What happens to the gases?



9 Complete the model text below by choosing the correct alternative in each case.

Model text

The diagram shows the various stages in the production of clean energy from coal.

[1] *First of all/At first/One*, the coal is mined in deep pits underground and then carried to the surface. [2] *Furthermore/After that/As a result*, it is carried along a conveyor belt to a power plant, [3] *when/then/where* it is burned in a large furnace to which oxygen is added. [4] *Otherwise/From this/Therefore*, raw syngas is produced. At the next stage of the process, harmful substances like carbon dioxide, mercury, and sulphur are removed. [5] *Following that/ Following/ Subsequent*, the purified gas is used to drive a gas turbine. The turbine [6] *in turn/ afterwards/therefore* powers a generator, producing electricity. The gas turbine also produces hot exhaust gases. These are [7] *then/therefore/consequently* piped to a heat recovery steam generator, which converts the heat into steam. The steam is [8] *consequently/subsequent/subsequently* used to power a steam turbine, which again is used to generate electricity.

The energy is clean because harmful products are removed and the coal is not transported to another site to produce electricity.

Technique

When describing processes, use phrases such as *First of all*, *After that*, and *When* as trigger words to help you sequence ideas.

10 Connect the sentences below. Use the **linking words** in brackets in each case.

Example

The parts of the car are assembled. The cars are exported. (after)
After the parts of the car are assembled, the cars are exported.

a The snow falls. It covers the ground with a protective layer. (when)

.....

b Her cubs are born. The lioness licks them all over. (as soon as)

.....

c The paper is collected. It is sent for recycling. (once)

.....

d Volcanoes erupt. They send huge amounts of smoke into the air. (before)

.....

e The plants perspire. The air becomes humid. (when)

.....

f The trees are cut down. The forest is gradually destroyed. (and)

.....

11 Connect these sentences using your own words.

a The food is processed. It is packaged. It is distributed.

.....

b The cycle is completed. It repeats itself all over again.

.....

c The rubbish is collected. It is sent to a centre for sorting. It is recycled.

.....

d A new model of the bicycle is developed. The bicycle is tested.

.....

e The TV is assembled. It is sent to the shops.

.....

f The water is purified. It is bottled.

.....

g The data about the weather is collected. The information is then broadcast.

.....

h The prototype is tested. It is modified.

.....

12 From your own knowledge, write a short paragraph to describe each of the processes below.

a The process of digital photography from the action of taking a photograph to displaying the image.

b The progress of a letter or parcel from packaging to delivery.

c The life cycle of an animal such as a butterfly or a frog.

d The water cycle which creates clouds and rainfall.

UNIT 4

Education

Unit aims

Task 1	Task 2
General and specific statements	Avoiding overgeneralization
Comparing information	Developing reasons
Describing proportions	

Task 1 General and specific statements

1 The statements below give students' reasons for choosing a particular university. Which of these statements do you agree with?

a The lecturers' qualifications are more important than the quality of the teaching.

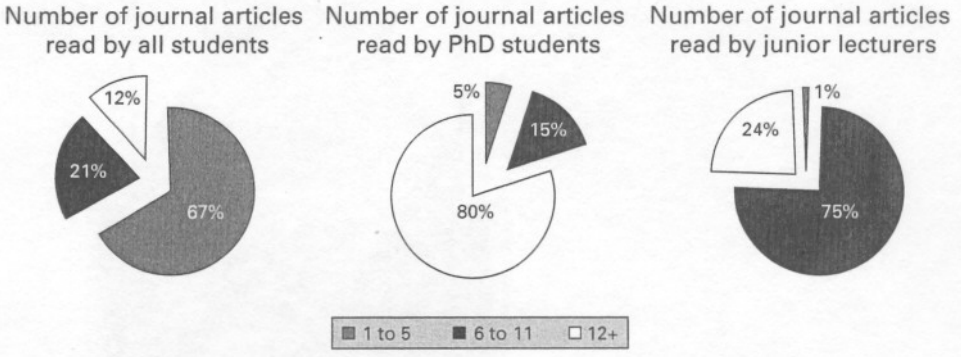
b The sports facilities are as important as the academic resources.

c Good library facilities are the most important factor for postgraduate students.

d A pleasant environment is more important than the university's reputation.

2 Look at the pie charts and the Task 1 question. Answer questions a–e below.

The pie charts below illustrate the number of journal articles read per week by all students, PhD students, and junior lecturers at an Australian university.



Summarize the information by selecting and reporting the main features, and make comparisons where relevant.

a What does each pie chart describe?

b What do the numbers on each pie chart represent?

c What does the box at the bottom of the pie charts refer to?

d What noticeable feature can you see in each chart?

e What general statements can you make about each chart?

3 Complete sentences a–g using the phrases below.

that	respectively	for example	how	but
which	meanwhile	whereas	and	

a The three pie charts illustrate ..... many articles from academic journals are read weekly by PhD students ..... junior lecturers compared to other students at an Australian university.
b ..... the overwhelming majority of those studying doctorates read at least twelve articles per week in comparison with the average student.
c The figures were 80 per cent and twelve per cent ..... .
d Furthermore, only five per cent of PhD level students read between one and five articles, ... the average for all students in this category is a hefty 67 per cent.
e ..... , for junior lecturers the pattern appears to be slightly different.
f Most read six or more articles per week (99 per cent), ... out of this total 24 per cent read twelve or more, ... is almost a third of the corresponding figure for PhD level students.
g It is clear ..... those students who are researching for a PhD read more articles than either junior lecturers or other students.

4 **The sentences in 3 form a model text. Group the sentences into four paragraphs.**

Paragraph 1: .....
Paragraph 2: .....
Paragraph 3: .....
Paragraph 4: .....

5 **Descriptions contain general and specific statements. Specific statements contain reference to data, whereas general statements do not. Which statements in 3 are general? Which are specific?**

6 **Divide the following sentences into general and specific statements.**

Examples

General: Postgraduate students tended to be better off than other students.
Specific: Seventy-five per cent of school children read comics each week.

a Far fewer female lecturers as opposed to male lecturers are employed at the university, 25 and 75 respectively.
b We can see that there are considerable differences in the proportion of nationalities in each course.
c Only ten per cent of students preparing for their Masters attended taught classes.
d Overall, women were more likely to read novels than men.
e Students preparing for their doctorate read the greatest number of journal articles.
f The sales for all four companies showed similar trends.
g The pattern for senior lecturers was very different.
h The vast majority of those students preparing for PhDs read twelve or more journal articles each week.

Technique

Aim to make at least one general statement in the middle of your text.

Comparing information

7 Rewrite the following sentences using the given words so that the meaning is the same.

a Far more PhD students read over twelve articles a week compared with junior lecturers.
Far fewer .....

b The average student reads fewer journal articles than the average junior lecturer.
The average junior lecturer .....

c The other students at the university do not read as many articles as the average PhD student.
The average PhD student .....

d Junior lecturers do not have as much time to read articles as those students who are researching for a PhD.
Those students who are researching for a PhD .....

Describing proportions

8 The phrases in the list are alternative ways of describing proportions. Divide the list into four groups that each have similar meanings.

three quarters almost half one third 75 per cent one in three
nearly half 26 per cent 48 per cent about one in four 33 per cent
three out of four just under one half just over a quarter
close to one half

9 These adjective-noun collocations can also be used to describe proportions. Write the adjectives next to the correct meaning in the table.

the *vast* majority a *tiny* minority a *massive* 85 per cent
a *modest* twelve per cent a *hefty* 85 per cent
a *mere* twelve per cent the *overwhelming* majority

Very big	.....
Very big (used before numbers)	.....
Very small	.....
Not very big (used before numbers)	.....

Technique

Vary the way you express proportions – sometimes use words instead of numbers.

10 Rewrite sentences a–e, replacing the phrases in italics with an alternative expression.

a We see from the chart that *23 per cent* of students failed to finish their university degree.

b In 1990, *nine out of ten* engineering students were male, but by 2000 this figure had fallen to *exactly three quarters*.

c In 1960, *34 per cent* of science graduates went into the teaching profession but in 1970, the figure was just *ten per cent*.

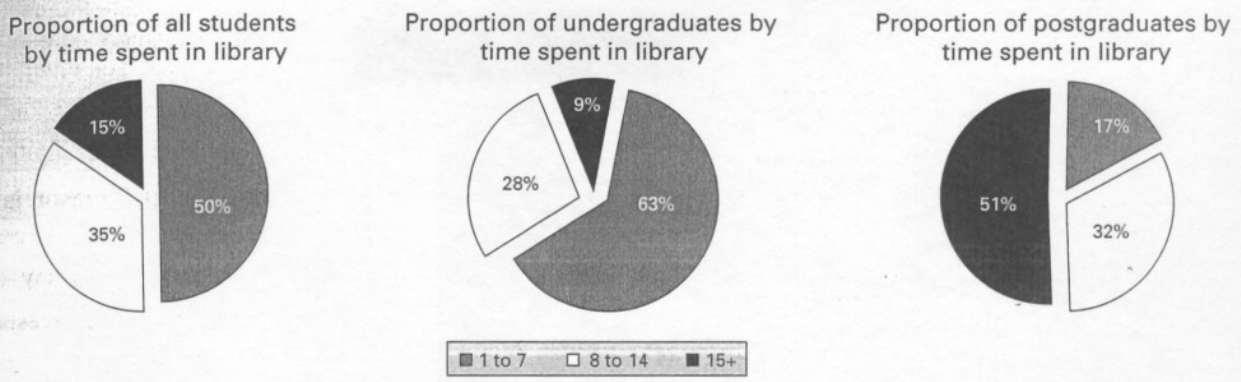
d *Exactly one half* of the student population were members of the union in 2001, but five years later the figure was *64 per cent*.

e *Ninety-two per cent* of people surveyed felt that mixed sex schools were preferable.

11 Read the Task 1 question below and answer questions a–e.

Task 1

The pie charts below show the number of hours spent in a British university library by undergraduates, postgraduates, and the total student population.



Summarize the information by selecting and reporting the main features, and make comparisons where relevant.

a What are the similarities between postgraduate and all students?
b What are the main differences between undergraduate and postgraduate students?
c What tendency can you observe as students move from undergraduate to postgraduate?
d What is the most interesting feature of the three charts?
e What general conclusions can you draw?

12 **Choose the most suitable alternative to complete the sentences below about the data in 11.**

a Meanwhile, the *pattern/amount/majority* for postgraduate students was substantially different.
b Overall, the *pattern/size/proportion* of postgraduate students who spent fifteen hours a week or more in the library was very close to the entire student body who spent 1–7 hours in the library.
c The most striking difference in the data for undergraduates was that a sizeable *majority/minority/number* spent only 1–7 hours per week in the library.
d A *majority/minority/total* of undergraduates (nine per cent) used the library for fifteen or more hours per week.
e There is a clear *trend/progress/drift* towards using the library more as students move towards graduation and post-graduation.
f Undergraduate students were less likely than postgraduate students to use the library with just under *one quarter/one third/two-thirds* of the former spending 1–7 hours there.
g About a *third/quarter/minority* of undergraduate students as opposed to nearly a third of postgraduate students spent between eight and fourteen hours studying.

13 **In your own words, write two sentences about each pie chart and one summarizing sentence.**