



**A**

### Jason Smith

is a mathematician who is working on a program that aims to make virtual surgery a reality.

'Imagine the benefits of such technology in use! A surgeon will be able to **carry out** an operation on your "digital double", which is a "virtual you" generated by a computer. By doing so, the surgeon can learn from any mistakes he/she makes. If the surgeon is finally certain of success, he/she then will operate on you without any problems. The surgeon will be able to practise the operation several times before actually doing it, which means that there will be fewer mistakes,' says Jason.

This technology is called surgical simulation and, without doubt, going to save lives. The method of creating a digital double involves complex geometry and mathematics. 'The possibilities are endless,' adds Jason. 'If the technology was available right now, patients would even be spared of a trip to the doctor's. A scan would be sent to the doctor who would make a correct diagnosis and prepare for the operation before asking the patient to come in.'



**B**

### Jane Watson

is a plant biologist involved in a project which aims to help farmers investigate and monitor plants and the conditions in which they grow.

Presently, farmers grow crops without knowing what the end result will be. If they knew what problems could **come up**, they would take steps to avoid them. Researchers, such as Jane, have combined their expertise in an effort to make it easier for farmers to predict the success of their crops.

'The program is actually a 3D model of a virtual plant growing,' says Jane. 'By entering different parameters, such as temperature, we are able to see the effect that they will have on the plant. Furthermore, once they have planted their crops, farmers will be able to keep an eye on them and improve plant care by giving their crops what they need, when they need it.' When this program is widely used, it will revolutionise effective crop management and it will result in cheaper and better quality food for all.

**C**

### Carol Austen

is an archaeologist who was involved in a ten-year project named 'Rome Reborn 1.0'. This project used advanced technology to digitally rebuild ancient Rome. It is the largest and most complete simulation of a historic city ever created. 'We have digitally recreated monuments that no longer exist, and we have digitally restored sites that have been destroyed with time, but this is by far the most ambitious project ever to be done,' says Carol.

It is a true 3D model that runs in real time. Users of the program can work their way through the model as they wish. It is sure to serve as a prototype for other city models of historic value. 'The good thing is that if new discoveries are made, the program will simply be updated to include them and this is why I think that we will not be able to **do without** it when teaching our children about ancient Rome,' adds Carol.



**D**

### Paul Parker

is a 15-year-old boy who is receiving treatment for burns which he got when a pot of boiling water fell onto his leg. It is a well-known fact that the treatment for a burn is worse than the actual injury. For this reason, nurses and physicians at Nationwide Children's Hospital decided to use virtual reality games

to help young victims **put up with** the pain of wound care. Research shows that anxiety and pain are strongly connected and if patients are distracted, anxiety is reduced and the procedure becomes less painful.

'At first the nurses gave me books to look at and sometimes music to listen to, but they did little to lessen the pain of having my wounds taken care of. Then, one day, they let me play with a virtual reality game and I was so engrossed in playing the game that I was surprised when the nurse told me that she had finished dressing my wounds,' says Paul.

### 5. POST-READING Discuss.

- In your opinion which of the new technologies mentioned in the texts is or will be of most importance?
- Can you think of any other uses of virtual reality apart from those mentioned in the texts?
- How can virtual reality be used in the classroom and in the workplace?

# 4b vocabulary & grammar

## Vocabulary

### 1. PREFIXES AND SUFFIXES

A. Look at the words in bold in the sentences below. What do you think they mean? Choose a or b.

- The possibilities are **endless**.  
a. coming to an end      b. having no end
- This project used advanced technology to digitally **rebuild** ancient Rome.  
a. build again      b. build a part of
- If patients are distracted, anxiety is reduced and the procedure becomes less **painful**.  
a. causing pain      b. without pain
- The doctor's diagnosis was **incorrect** so they didn't give the patient the right medicine.  
a. accurate      b. wrong
- This information is **unimportant** and I'm not going to consider it.  
a. very important      b. not important



### NOTE

- The prefixes **un-** and **in-** are used before adjectives and adverbs to give them the opposite meaning (able – unable, correct – incorrect).
- The prefix **re-** is used before verbs and nouns deriving from verbs, and often means again (build – rebuild).
- The suffix **-ful** is used after a noun to form an adjective which means having enough of (success – successful).
- The suffix **-less** is used after a noun to form an adjective which means not having (doubt – doubtless).

B. Complete the sentences using the correct form of the words in capitals.

- Helen should be more \_\_\_\_\_ with her work; there were a lot of silly mistakes in her exam paper. **CARE**
- Scientists believe too much sunbathing is \_\_\_\_\_ to your health. **HARM**
- Tom is an \_\_\_\_\_ leader; he doesn't know how to motivate people. **EFFECTIVE**
- Spiders make me feel very \_\_\_\_\_. **COMFORTABLE**
- If you want to be \_\_\_\_\_ in business, you have to plan carefully. **SUCCESS**
- The woman was very \_\_\_\_\_; she showed us how to get back to our hotel. **HELP**
- Since he lost his job and the bank took back his house, Kevin has been \_\_\_\_\_. **HOME**
- They are trying to \_\_\_\_\_ the buildings that were damaged in the earthquake. **CONSTRUCT**

### 2. EXPRESSIONS WITH THE WORD 'EYE'

A. Look at the following extract from text B on page 67.

What does the expression in bold mean?

Furthermore, once they have planted their crops, farmers will be able to **keep an eye on** them and improve plant care...

B. Read the sentences below and match the expressions in bold with their meanings a-d.

- The bracelet **caught my eye**; it was made of diamonds and emeralds. ☐
  - Tom and Betty can never **see eye to eye** on anything. ☐
  - Sheila **closed her eyes** to David's many faults. ☐
  - My grandmother always **had an eye for** a bargain. ☐
- a. to be able to judge if something is valuable or attractive  
b. to attract one's attention  
c. to ignore something  
d. to agree about something

## Grammar

### 1. CONDITIONAL SENTENCES

#### FOCUS ON USE

Look at the examples below taken from the texts on page 67 and answer the questions that follow.

- If the technology was available right now, patients would even be spared of a trip to the doctor's.
- ...If new discoveries are made, the program will simply be updated to include them...
- ...If patients are distracted, anxiety is reduced and the procedure becomes less painful.

- Do the sentences refer to the past or present/future?
- Which sentence expresses something which generally happens?
- Which sentence expresses something which is possible to happen in the future?
- Which sentence expresses something imaginary?
- In which of the sentences could *if* be replaced by *when*?

#### FOCUS ON FORM

Look at the sentences 1-3 again and complete the rules below.

**Zero Conditional** = a general truth or something that always happens

if or when + Present Simple →

**Conditional Sentences Type 1** = something which is possible to happen in the present or future

if + \_\_\_\_\_ → will, can, must, may, might  
or should + base form  
imperative

**Conditional Sentences Type 2** = something imaginary/unreal or unlikely to happen in the present or future

if + \_\_\_\_\_ → would, could + base form

### NOTE

- Unless* can be used instead of *if*... *not*... in conditional sentences.
- If I were you* is often used to express an opinion or give advice.

Go to Grammar Reference

## English in use

Choose the word or phrase that best completes each sentence.

1. If I go to Australia, I \_\_\_\_\_ the Great Barrier Reef.  
a. will visit                      b. am visiting                      c. would visit                      d. visit
2. If I stay under the sun for too long, I \_\_\_\_\_.  
a. am burning                      b. burned                      c. burn                      d. would burn
3. If I were you, I \_\_\_\_\_ those mushrooms; they're poisonous.  
a. wouldn't eat                      b. would eat                      c. will eat                      d. should eat
4. If I saw a lion, I \_\_\_\_\_ up the nearest tree.  
a. will climb                      b. climbed                      c. climb                      d. would climb
5. The Internet allows people from all over the world to connect \_\_\_\_\_ each other.  
a. into                      b. from                      c. against                      d. with
6. Kelly thought that the end of the film was very \_\_\_\_\_.  
a. preferable                      b. noticeable                      c. predictable                      d. comparable
7. John had to \_\_\_\_\_ changes in the number of squirrels in the area for his science project.  
a. simulate                      b. monitor                      c. measure                      d. generate
8. Jennifer's area of \_\_\_\_\_ is criminal law.  
a. expertise                      b. recreation                      c. programme                      d. technology