

# TECHNOLOGY <sup>2</sup>

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Get ahead in technology



**In this unit**

- reading for information and exchanging information with others
- speaking about course components
- *-ing* form and *to* infinitive after certain verbs
- ordering and delivering a short talk

**Reading****Studying technology**

- 1 The texts describe different ways of studying technology. Work in groups of three. Read one text each and note the information.
  - 1 Which way of studying technology does your text describe?
  - 2 Why did the student choose this way?
  - 3 What kind of courses do the students take?
  - 4 How long does it take to complete their study?
  - 5 What kinds of jobs can they do when they complete their studies?
- 2 Now find out from the others in your group about the texts they have read.

**A University**

Cristina is a second-year student of Electronic engineering at university. She decided to study at university because she wants the best choice of career and because she's interested in doing research in digital communications in particular. Most degrees take three years to complete, but some take up to five years because they include periods of work experience.

Degrees may have a broad focus, for example Electrical engineering, or focus on a specialized area, such as Power and High-voltage engineering. Cristina's course is broad-based to start, but she can specialize in digital communications later. Engineering can be studied in combination with other subjects. Cristina is taking German because she wants to spend six months in a German telecommunications company. This work experience will earn her credits towards her degree.

There is a wide career choice for graduate Engineers in design, production, quality assurance, and other fields. They may also work in marketing or become managers.

Cristina hopes to become a Research Engineer, finding new and better ways of doing things.

**B Technical college**

Okan is a first-year student at a technical college. He chose to study full time because he wanted to get a qualification before he started work. He thinks that being at college will give him more time to decide exactly which career he wants to follow and that having a qualification first will help him to get the kind of job he wants.

Colleges offer a wide range of vocational qualifications. Courses combine applied science, practical skills, and technical know-how. An Electronics Technician, for example, studies physics to understand the principles of the subject, learns how to find faults in equipment, and acquires a great deal of knowledge about electronic devices and components. Courses also include Communication skills to help students deal with communication at work and with the public.

College courses may take a year for a certificate and two years for a diploma. When he graduates, Okan can start work as a Technician or go on to further study at university.

**C Apprenticeship**

Alessandro has just started as an apprentice Aircraft Fitter with a large defence industry company. Apprenticeships are a way of combining work with practical training. He chose an apprenticeship because he wanted to leave school and start working and earning money as soon as possible.

Today, apprentices combine work, on-the-job training, and part-time study on a day-release basis at a local college, paid for by their employer. Apprenticeships last from one to three years. In Alessandro's case, over the next two years he can obtain vocational qualifications to become a skilled Technician. He can also study to obtain entrance qualifications for higher-level studies so he can go on to become an Aeronautical Engineer.





### Gadget box

Moodle is a course management system (CMS) – a free, Open Source software package designed to help educators create effective online learning communities. The Moodle approach to education emphasizes that learners (and not just teachers) can contribute to the educational experience in many ways. What software packages do you use in your learning?

## Problem-solving

- 1 Work in pairs. List the questions you expect to find answered in a description of a course in a college prospectus.

### EXAMPLES

*Which subjects will I study?*

*How much will this course cost?*

*How long will the course last?*

- 2 Now study the course description. Each section begins with a question, as in the examples. Fill in the questions.

- 3 With the help of the text, explain these terms.

- 1 vocationally-focused
- 2 conventional entry requirements
- 3 work-based learning
- 4 prior knowledge
- 5 in-course assessments
- 6 sustained growth

# COMPUTING - WEB TECHNOLOGIES

## Foundation Degree – Level 4 – Part Time

- 1 **What does this course involve? / Who is this course for? / What are the course aims?**

This course is a vocationally-focused higher education qualification. It provides the high level of technical skills that will be needed by many organizations. Foundation Degrees are designed for learners from a wide range of backgrounds, including those who have work experience but do not have conventional entry requirements.

2

The Foundation Degree in Computing (Web Technologies) will include IT Applications (Access and Excel), System Design, User Support, and Professional Studies. Additional modules enable particular specialisms to be developed. These include Website Development, Visual Programming, Database Systems, Networks and Communications, and Website Management.

3

The course is delivered using tutor-led classes, workshops, practical sessions, and tutorials. Additional support is given when requested.

4

For the two-year course: students must have at least one year of experience in related employment and an employer who is willing to support them by providing suitable work-based learning projects and academic monitoring. Prior knowledge of computing is helpful but not essential.

5

The programme of study requires you to study twelve modules over two or three years.

6

Studying over two years requires attendance for one day per week from 9 a.m. till 9 p.m. with breaks.

7

All units are assessed and graded. Most units involve in-course assessments. Systems Design and Networks and Communications are assessed by examination. To be awarded a Foundation Degree, you must pass a minimum of ten modules.

8

### Further study:

The Foundation Degree in Computing (Web Technologies) has been designed to enable successful students to progress to the final stage of the University's Honours Degree in Computer Studies should they wish to do so. This would involve just one more year of full-time study or two years of part-time study.

### A career:

A Foundation Degree opens up the possibility of a career in a wide range of areas throughout commerce, industry, entertainment, and the public sector. There is sustained growth in employment prospects for all IT specialists.



## It's my job



- Before you listen to Stuart Cole, an Engineering Apprentice, look at **C** in *Reading* on p.5. Try to predict the answers to these questions.
  - How does he spend his working week?
  - How long will his apprenticeship last?
  - What sorts of skills will he acquire?
- Now listen and check your answers.
- Listen again and answer these questions.
  - What does Stuart's company make?
  - What stage in his apprenticeship is Stuart at?
  - Why is there a lot of paperwork?
  - Why do you think he has two days a week at college now?
  - When does he study?
  - How much studying does he do?
  - What are the attractions of becoming a team leader?
- Work in pairs. Listen to what Stuart says in the last section of the recording (from 'I like learning ...'). Help each other to make a complete and accurate version. Then compare with the *Listening script* on p.124.

## Language spot

### -ing form and to infinitive

- Study these examples:

She started **working** and **earning** money.

He's interested in **doing** research.

Research Engineers find new and better ways of **doing** things.

She wanted **to leave** school.

He wanted **to get** a qualification.

He decided **to study**.

- We use the *-ing* form after prepositions and after certain verbs, for example:

avoid	keep (on)	suggest
enjoy	practise	
finish	stop	

- We use the *to* infinitive after certain verbs, for example:

afford	decide	mean
aim	hope	promise
choose	learn	want

- With some verbs, we can use both the *-ing* form and the *to* infinitive with little change of meaning, for example:

begin	intend	prefer
continue	like	start
hate	love	

### » Go to **Grammar reference** p.114

- Fill the gaps from an interview with an apprentice. Use the correct form of the verbs in brackets.
  - I didn't enjoy \_\_\_\_\_ (study) very much.
  - But I was always good at \_\_\_\_\_ (work) with my hands. I enjoyed working on motorbike engines.
  - I learned \_\_\_\_\_ (repair) electrical equipment with my father's help.
  - He suggested \_\_\_\_\_ (take) a course at college.
  - But I wanted \_\_\_\_\_ (start) work as soon as possible after school.
  - I decided \_\_\_\_\_ (apply) for an apprenticeship with a local company.



Scientists investigate that which already is. Engineers create that which never was.

Albert Einstein

- 2 Use the correct form of the verbs to complete the gaps in these sentences about jobs in technology.


become	do	measure
connect	maintain	repair
cut	make	transfer
design	manufacture	turn

- Maintenance Technicians are responsible for \_\_\_\_\_ and \_\_\_\_\_ equipment in a factory.
- Estimators calculate the costs of \_\_\_\_\_ and \_\_\_\_\_ a product.
- Research Engineers find new and better ways of \_\_\_\_\_ things.
- Fitters are responsible for \_\_\_\_\_ new equipment to the network.
- Design Engineers aim \_\_\_\_\_ ideas into plans.
- Control Engineers attempt \_\_\_\_\_ and regulate all the variables in a system.
- Production Engineers plan \_\_\_\_\_ things in the most efficient way.
- They look at ways of \_\_\_\_\_ production costs.
- Some Engineers decide \_\_\_\_\_ to marketing.
- Others choose \_\_\_\_\_ managers.

## Pronunciation

### Unstressed syllables

Study the *Glossary* entry for the word *environmental* on p.132. In addition to giving its meaning, it tells you how to pronounce the word. The stressed syllable of the word comes after /'/. When we stress a syllable, we say it more clearly; we take a little longer to say it and we pronounce the vowel sound fully.

- 1  Listen to the nouns in the completed *Vocabulary* table. Mark the stressed syllable in each word with a /'/. Note that sometimes the stressed syllable shifts in related verbs, nouns, and adjectives. For example:  
*mechanic* /mə'kænɪk/      *mechanism* /'mekənɪzəm/

## Vocabulary


### Word families

Fill in the missing words. All the words are used in this unit.

Verb	Adjective	Noun
transmit	-	
perform	-	
propel	-	
-		electricity
install	-	
	-	regulation
develop	-	
maintain	-	
specialize	-	
qualify	-	
-		medicine
-		environment

- 2 In unstressed syllables, the vowel sounds are weak. In the *Glossary* these are marked with /ə/. This is one of the commonest sounds in English. Note the /ə/ sound in *environmental*:

/ɪn,vaɪrən'mentl/

-  Listen to the nouns in the *Vocabulary* table. Underline the weak /ə/ vowel sounds.



# agriculture

## Checklist

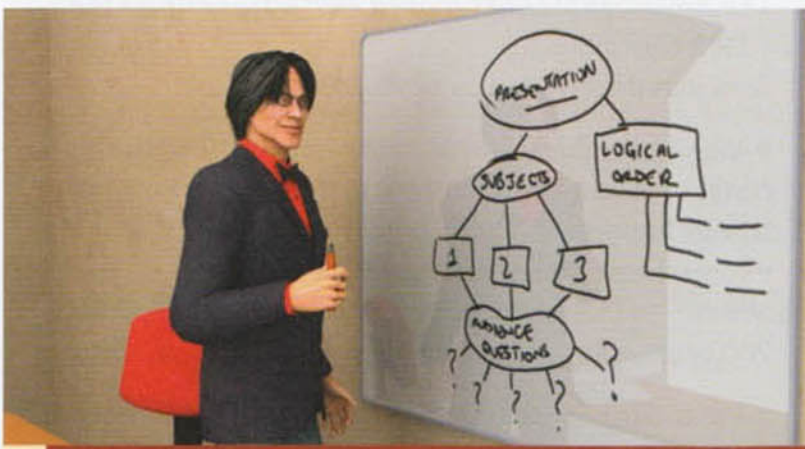
Assess your progress in this unit. Tick (✓) the statements which are true.

- I can use the *-ing* form and *to* infinitive after certain verbs
- I can work out the meaning of words from context
- I can recognize the difference between stressed and unstressed syllables
- I can order and deliver a short talk
- My reading and listening are good enough to understand most of each text in this unit

## Make your point

### Ordering a presentation

The first step in preparing any talk is to make notes of the things you want to say and to put these notes in the best order. Read the advice from Lee Avatar.



- Note down what your audience wants to know or needs to know about the subject.
- Sometimes it helps to make a set of questions you intend to answer for your audience. Each of your points should help to answer these questions.
- Arrange your points in a logical way that your audience can follow. Don't jump from one point to another in a haphazard manner.
- Give examples to help your audience understand your points.

- 1 Decide what is the best order to present these points in a student talk on hybrid cars.
  - a Why are hybrid cars becoming popular? \_\_\_\_\_
  - b How is the battery charged? \_\_\_\_\_
  - c What is a hybrid car? \_\_\_\_\_
  - d When are both the engine and motor used? \_\_\_\_\_
  - e The future of hybrid cars \_\_\_\_\_
  - f When is the petrol engine used? \_\_\_\_\_
  - g Some popular makes \_\_\_\_\_
  - h The two basic types \_\_\_\_\_
  - i When is the electric motor used? \_\_\_\_\_
- 2 Now make notes about your course for a one-minute talk. Practise your talk in a group of three. Ask the other students at least one question after their talks.

## Key words

### Adjectives

aeronautical  
environmental  
skilled

### Nouns

apprentice  
degree  
know-how  
marketing  
media  
paperwork  
production costs  
qualification  
quality assurance  
work experience

### Verbs

earn money  
find faults

Note here anything about how English is used in technology that is **new** to you.



# 2 Food and agriculture

## Switch on

- 1** Look at the pictures of some famous agricultural inventions. Match the pictures A–D with the inventions 1–4. What do you think they were used for? Which one do you think was invented first?
- barbed wire (invented by Joseph Glidden)
  - cotton gin (invented by Eli Whitney)
  - reaper (invented by Cyrus McCormick)
  - seed drill (invented by Jethro Tull)
- 2** Read the texts and write the name of the invention on the lines.

1 \_\_\_\_\_

This mechanical device removes the seeds, hulls, and other small objects from the fibres, a process which had been very labour-intensive before. The invention of this implement quickly led to further industrial inventions for producing fabric, such as spinning and weaving machines.

2 \_\_\_\_\_

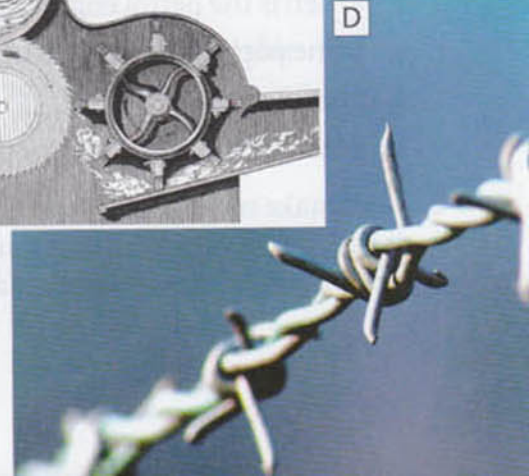
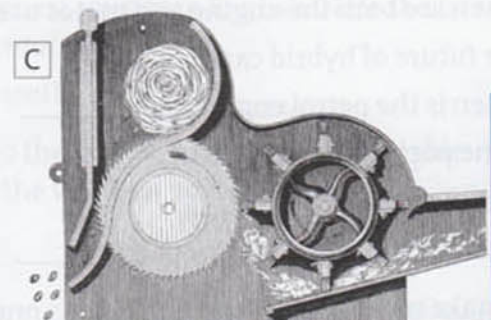
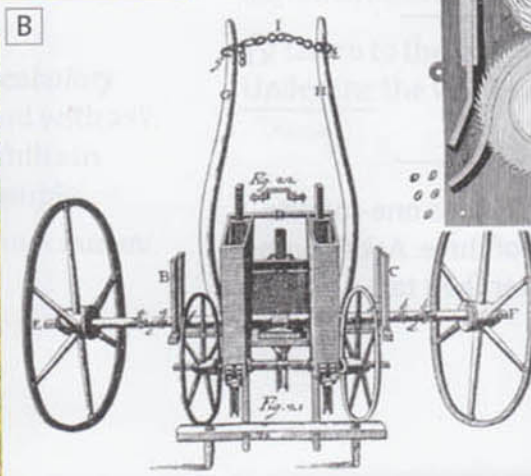
As the American frontier moved westwards during the 19th century, there was a shortage of wooden rails and stone. As a result, there was a need for an alternative material for fencing structures. This material allowed large areas of land to be divided into fields.

3 \_\_\_\_\_

When seed was scattered by hand, it was often eaten by birds or failed to germinate. This horse-drawn machine made a hole and planted seeds automatically in straight rows, so reducing the amount of waste.

4 \_\_\_\_\_

This machine for harvesting was the first step in the mechanization of farm work. The first version cut standing grain mechanically, and two men swept the grain into piles. It was five times faster than cutting by hand. A more advanced machine could also tie the grain into bundles. It was eventually replaced by the modern combine harvester – operated by only one person.



## Language spot

### Past Simple v Present Perfect

- Study these examples from *Switch on*. What tense is used?

*When did Jethro Tull invent the seed drill?*

*The American frontier moved westwards during the 19th century.*

*Seed was often eaten by birds. (passive)*

- We use the Past Simple to ask questions with *What time?* or *When?*, and to make statements about when things happened. These are common past time expressions we use with the Past Simple:

<i>when</i>	<i>during the 19th century</i>	<i>in 1793</i>
<i>200 years ago</i>	<i>the last century</i>	<i>yesterday</i>

- We use the Present Perfect Simple, often with *since* or *for*, for actions which happened during a period from the past to the present. We also use it for past events when no specific time is given or when the time is unimportant, or to show that the event is relevant now.

*Over the years there have been many similar inventions, but this one has been the most popular.*

*The same principle has been used in machines ever since. (passive)*

- We use the Present Perfect Continuous to emphasize the activity itself. The activity may or may not be complete. We use the Present Perfect Simple to answer *How many?* or *How much?*

**A** *They've been harvesting wheat for the last three days. (The fields are looking bare.)*

**B** *How much grain have they harvested?*

**A** *They've filled five silos.*

» Go to **Grammar reference** p.114



**In this unit**

- studying the impact of agricultural inventions and developments
- Past Simple v Present Perfect
- how to begin a presentation
- scanning a text for required information

- 1 Complete the text about the history of tractors. Put the verbs in brackets in the correct tense, Past Simple or Present Perfect Simple, active or passive.

Tractors \_\_\_\_\_<sup>1</sup> (use) on farms since the start of the twentieth century. The first mechanical implements \_\_\_\_\_<sup>2</sup> (draw) by horse. Around 1920, petrol-engined tractors \_\_\_\_\_<sup>3</sup> (begin) to replace the horse. These early tractors \_\_\_\_\_<sup>4</sup> (pull) implements from a drawbar. Around 1940, tractors \_\_\_\_\_<sup>5</sup> (begin) to use a hydraulic lift system. In addition, it \_\_\_\_\_<sup>6</sup> (be) possible for farmers to use a power take-off shaft for trailed implements, such as manure spreaders. Since the early 1950s, there \_\_\_\_\_<sup>7</sup> (be) many improvements in design. There \_\_\_\_\_<sup>8</sup> (be) changes in the tractor cab, making it safer and more comfortable. Computer systems \_\_\_\_\_<sup>9</sup> (make) it possible for farmers to check on operations. The engine power for tractors \_\_\_\_\_<sup>10</sup> (increase) over the years. For many years it \_\_\_\_\_<sup>11</sup> (be) 20–40hp, but it \_\_\_\_\_<sup>12</sup> (rise) to over 120hp, and sometimes over 200hp.

- 2 Use the notes to write sentences in the Present Perfect Simple or Present Perfect Continuous.

- 1 He / work / on this project / since joining the company.
- 2 How much field data / you / collect?
- 3 Erik and Al / study / agriculture / for two years and they are really enjoying it.
- 4 They / design / a robot system to kill weeds and they / demonstrate / it to potential manufacturers over the last few weeks.
- 5 Since the 1980s manufacturers / made / a number of improvements in design.
- 6 They / not / use / this machine for long. They still need some time to get used to it.

## Listening

### Precision agriculture

- 1 Look at the pictures. What do you understand by the term *precision agriculture*?



- 2 Listen to Barry Stones, an Agricultural Engineer, talking about precision agriculture and see if your ideas were right.
- 3 Listen again and answer the questions.
- 1 What sorts of variations could there be in a field?
  - 2 Why is it not a good idea to apply chemicals to a field uniformly?
  - 3 In what ways can information about the field be collected?
  - 4 What example does Barry give to show the savings that can be made?
- 4 Note the advantages and disadvantages of the two systems for collecting information. Then listen again to complete and check your answers.

	Advantages	Disadvantages
1		
2		



Otto Rohwedder was the only person who saw the point of sliced bread. He spent years trying to devise a system for holding the slices together after they were cut. His first invention used hairpins. In 1928 he finally succeeded, and only a few years later, 80% of all bread sold in America was pre-sliced.



## Pairwork

1 Work in pairs, A and B. Each of you has a short text about technology used in fruit production. Read your text and then answer the questions.

- 1 What is the technology used for?
- 2 What equipment is used?
- 3 What does it measure?
- 4 How has this technology benefited the growers?

Student A Go to p.110.

Student B

In the past, the only way to test the sweetness or firmness of fruit, such as apples, peaches, and apricots, was to select samples of the newly-harvested fruit and eat them! Farmers assumed that if they used this type of destructive testing on a few fruits, they would know about the condition of all the others in the batch. Now, every individual fruit can be tested using non-destructive technologies to grade and sort them. Imaging spectroscopy or multispectral imaging can measure the sweetness and firmness of fruit. An optical detector fuses four laser beams, each at a different waveband of light, into one. An imaging spectrograph, a digital camera, and a computer analyze the amount of laser light that is absorbed by the fruit. This indicates the sweetness of the fruit, while the firmness is measured by the amount of light bounced back.

This technology has many other applications in industry and in space exploration, but in the fruit industry it is used to sort fruit just after it has been picked.

2 Ask your partner the same questions about his / her text and make notes.

3 Read your partner's text and check your notes.

## Problem-solving

1 Work with a partner. Use the words to fill the gaps. activity conditions destroyed disease

The principle behind food preservation is to slow down the \_\_\_\_\_<sup>1</sup> of bacteria which could potentially cause \_\_\_\_\_<sup>2</sup>, or to kill bacteria completely. In addition, enzymes which cause food to discolour or decay can be \_\_\_\_\_<sup>3</sup> in certain food preservation methods. Preservation modifies the \_\_\_\_\_<sup>4</sup> which favour bacteria or enzyme activity.

2 With your partner match pictures A–G with the food preservation methods 1–7.

- |                              |                         |
|------------------------------|-------------------------|
| 1 refrigeration and freezing | 4 salting               |
| 2 canning and sealing        | 5 pasteurization        |
| 3 dehydration                | 6 fermentation          |
|                              | 7 chemical preservation |



A

B



C



D



E



F



G

**Suitable for vegetarian**

**Ingredients**  
Wheat Flour, Water, Yeast, Salt, Vegetable Oil, Soya Flour, Preservatives (Calcium Propionate, Potassium Sorbate), Vinegar, Emulsifiers (Mono-Di-Acetyl Tartaric Esters of Mono- and Di-Glycerid Fatty Acids, Mono- and Di-Glycerides of Fatty Acid Flour Treatment Agent (Ascorbic Acid), contains Wheat Fibre or Sugar Beet Fibre.

**Nutrition**

Typical Composition	One slice (36g) contains	100g contains
Energy	365kJ	1010kJ
Protein	50g	100g
Carbohydrate		




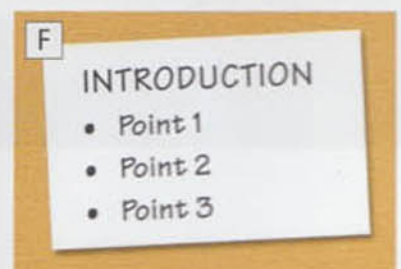
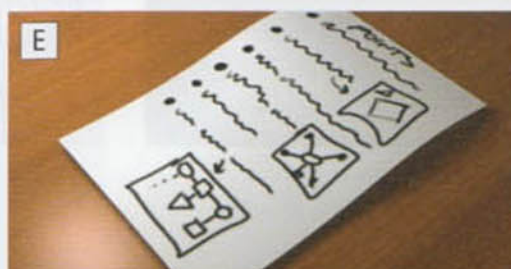
- 3** Match these principles with the one of the methods in **2**.
- Benzoates, nitrites, or sulphites either stop bacterial activity or kill bacteria.
  - Yeast produces alcohol, which kills bacteria.
  - Sodium chloride draws out the moisture and creates conditions which are not favourable for bacteria.
  - Cool conditions slow the activity of bacteria, while very cold conditions make bacteria totally inactive.
  - Boiling food and sealing it in a container with no air destroys any bacteria already present and prevents any more entering.
  - Boiling to between 62.8C and 72.8C destroys some bacteria and disables certain enzymes.
  - Bacteria die or become inactive in dry conditions.

## Make your point

### Beginning a presentation

As an expert in your technical field, you will have to present technical issues, often to people who do not have a technical background.

- 1**  Work in pairs. Listen to Lee Avatar talking about preparing a presentation. Match the pictures with some of the points Lee makes in his talk. Explain what each one represents.



- 2** Work in small groups. You have to give a presentation to a group of visitors about the town where you live. Practise giving the introduction to the others in your group. Use Lee's *Useful language*.



### USEFUL LANGUAGE FOR THE INTRODUCTION

Good afternoon.

Hello. It's good to see you [all].

My name's ... and I'm ... [job title].

I'm ... and I work in the ... department.

I'd like to explain how ... works.

I'd like to give you some information about ...

First of all, we'll look at ..., and then ... Finally, ...

If you want to ask me any questions, please interrupt.

I'll explain first of all and then you can ask any questions at the end.

I'd like to ask you to keep any questions until the end.

- 3** When you have finished, discuss the good points of each other's presentation. Think of ways you could improve it.

