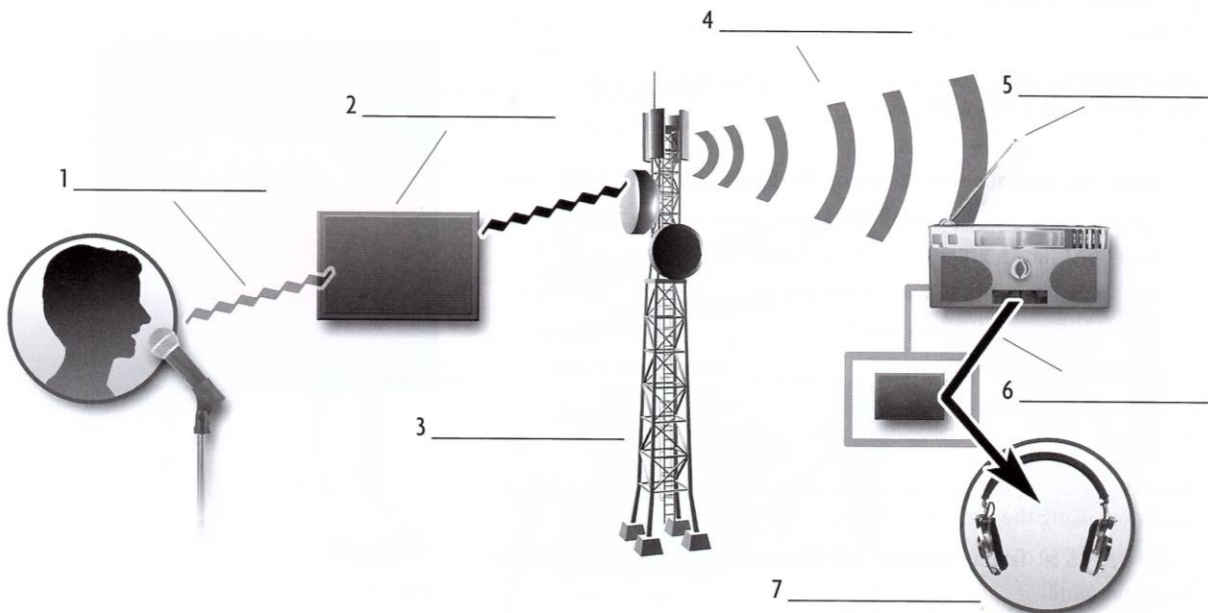


INVENTIONS

1 Have you heard of Guglielmo Marconi? He is said to have invented radio at the end of the nineteenth century. Until television became widespread, radio was one of the basic means of communication and entertainment. The simple transistor radio may seem a little old-fashioned in these days of mobile phones, laptop computers, and iPods. However, radio waves, which are invisible and undetectable to humans, have changed the world completely. When you use a mobile or cordless phone, a wireless network for your laptop, or switch TV channels by remote control, you are using radio waves.

2 So, how does it work? Let's take a radio programme as an example. Firstly, in the studio the voices and music are turned into electronic signals, called 'voice waves'. Next, they are made stronger by passing them through an amplifier. These stronger waves are called 'carrier waves' and they are passed to large aerials. Then the aerials send out these waves, which are now called 'radio waves'. These are subsequently picked up by a receiving aerial, in this case, the one on your radio. After this, the radio waves go through a reverse process. They are first turned back into voice waves, then passed through another amplifier, and finally sent out through speakers or headphones. The result is your favourite music or the latest news!



7 **Read Study Skill** Look again at paragraph 2 of the text and underline eight sequencing words or expressions.

STUDY SKILL Linking ideas (4)

Sequencing words are used to link steps in a description of a process.

Some examples are:

- *Firstly, ... Secondly, ... etc.*
- *Then ... Next, ... After that, ... Subsequently, ... etc.*
- *Finally, ... Lastly, ...*

WRITING How things are made

- 1 **Read Study Skill** Complete the sentences using the verb in brackets in the correct form of the passive.

STUDY SKILL The passive voice

When describing a process or a scientific experiment, it is important to write in a neutral style, as an observer.

To do this, you can use the passive voice.

The Present Simple Passive is often used in descriptions of processes:

is/are + past participle

Voices are turned into voice waves.

The Past Simple Passive is often used to talk about inventions and discoveries:

was/were + past participle

Radio was invented by Guglielmo Marconi.

- 1 The telephone _____ (invent) by Alexander Graham Bell.
- 2 A man _____ (send) into space for the first time in 1961.
- 3 X-rays _____ (discover) by William Roentgen.
- 4 Penicillin _____ first _____ (manufacture) in the 1940s.
- 5 Paper _____ (make) from trees.
- 6 A lot of paper _____ (recycle) these days.
- 7 Water and fats _____ (use) to make soap.
- 8 Glass _____ (make) from silica and limestone.

- 2 Read about the glass-making process. Complete the text with the verbs in brackets in the passive.

Glass was probably first made by the Egyptians about 5,000 years ago. It ¹ _____ (make) from silica, which comes from sand, limestone, and soda ash. Firstly, old glass ² _____ (add) to the silica. Then, the silica and the old glass ³ _____ (mix) in a machine. Next, this mixture ⁴ _____ (melt) in a furnace. Finally, the mixture ⁵ _____ (press) into shapes such as light bulbs.



- 3 Read the notes about the soap-making process. Expand them into full sentences using the verbs in brackets in the passive.

- 1 hot water & oil/fat (mix together) *Hot water and oil and fat are mixed together.*
- 2 mixture (distil)
- 3 alkali & perfume (add, mix well)
- 4 mixture (roll, dry, compress)
- 5 soap (cut, wrap, pack)

RESEARCH Reference books

1 Read Study Skill You want to find information from a reference book on subjects 1–12. Highlight or underline the word or category word. Compare answers with a partner.

- 1 Daniel Defoe
- 2 the Eiffel Tower
- 3 the South American country, Ecuador
- 4 deoxyribose nucleic acid
- 5 the Earth's atmosphere
- 6 the Sahara Desert
- 7 the Dead Sea
- 8 total eclipses of the sun
- 9 extinct animals, such as dinosaurs and dodos
- 10 how the diesel engine works
- 11 how long the river Danube is
- 12 Durban, South Africa

2 Look at the encyclopaedia index on page 56. Quickly find the page number for the information in exercise 1. Time yourself. Check your list and compare your time with a partner.

3 Where in the index would you add words 1–8?

- | | | |
|------------|--------------------------------------|------------|
| 1 Ecology | <i>between Eclipse and Economics</i> | 5 Diet |
| 2 Dynamite | | 6 Egg |
| 3 Drum | | 7 Dragon |
| 4 Dominica | | 8 Elephant |

4 Look at the inventions a–h. Where necessary, underline the key word. When were they invented? Use a reference book or search engine to find out (see Study Skill p42).

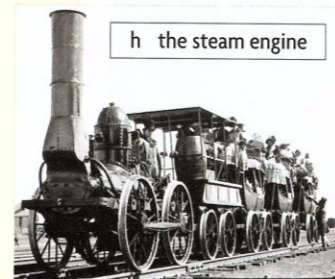
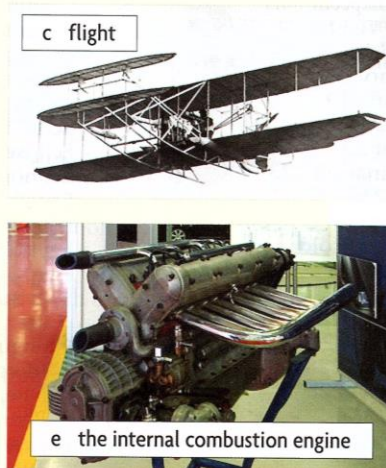
5 Which two inventions are the most important and why? Discuss with a partner.

STUDY SKILL Using indexes

To use an index in a reference book:

- decide which is the *keyword* and look for that, e.g. *the River Danube* (Danube), or what *category* the word might be in, e.g. *Gobi Desert* (Desert) and search for that.
- scan alphabetically.

If you can't find the reference, search again using another word in the phrase or title.



Dd

- Damascus, Syria 190, 321
- Dance 191
 - ballet
 - ceremonial
- Danube, river 192
- Dar es Salaam, Tanzania 193
- Dead Sea 195
- Deafness 195
- Decimal system 197
- Deer 198
- Defoe, Daniel (writer) 198
- Degas, Edgar (painter) 199
- De Gaulle, Charles (politician) 200
- Denmark 203
- Dentistry 204
- Deoxyribose Nucleic Acid (see DNA)
- Deserts 205
- Detergents 207
- Detroit, USA
- Diabetes 207
- Diamonds 208
- Dickens, Charles (writer) 209
 - David Copperfield*
 - Great Expectations*
 - Oliver Twist*
 - The Pickwick Papers*
- Dictionary 215
- Digestion 219
- Dinka 220
- Dinosaur 221
- Discrimination 223
- Disease 224
 - antibiotics
 - common cold
 - drugs
 - influenza
 - vaccines
- Dishwasher 228
- Disneyland 228
- Distillation 228
- Diving 229
- Dizziness 229
- DNA 230
- Dodo 231
- Dog 232
- Dolphin 234
- Dome 235
- Dominican Republic 236
- Donkey 237
- Doric capital 237
- Double bass 238
- Dragonfly 241
- Dream 241
- Drilling 242
- Dromedary camel 243
- Drug 243
- Dubai 245
- Dublin, Republic of Ireland 245
- Duck 246
- Duck-billed platypus 247
- Dumas, Alexandre (writer) 248
 - The Three Musketeers*
- Dundee, Scotland 249
- Dung beetle 249
- Durban, South Africa 250
- Dye 250
- Dynamo 250

Ee

- Eagle 252
- Ear 253
- Earth 255
 - atmosphere
 - climate
 - continental shelf
 - longitude and latitude
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- Earthquake 258
- Echo 260
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- Economics 261
- Ecuador 262
- Edison, Thomas (scientist) 263
- Egypt 264
- Egypt, ancient 265
 - architecture
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 - engineering
 - hieroglyphics
 - Nile, river
 - Pharaoh
 - pyramid
 - Tutankhamen
- Eiffel Tower 272
- Einstein, Albert (scientist) 272
- Engines 291
 - diesel
 - internal combustion
 - petrol

REVIEW Word-building (3)

- 1 **Read Study Skill** Review the text on page 53 to complete the compound nouns.

- 1 _____ radio
- 2 _____ computer
- 3 _____ waves
- 4 voice _____
- 5 _____ programme

- 2 Match the nouns to form compound nouns. There may be more than one possible combination. Use a dictionary to find out how to write them.

- | | |
|--|--------------|
| 1 ☐ information | a dish |
| 2 ☐ DVD | b laboratory |
| 3 ☐ answer | c machine |
| 4 ☐ fax | d phone |
| 5 ☐ word | e player |
| 6 ☐ cable | f processor |
| 7 ☐ satellite | g technology |
| 8 ☐ physics | h television |

- 3 **Read Study Skill** Complete the sentences. Use a compound adjective from the box.

hard-working	poorly-written
long-term	small-scale
self-motivated	high-speed
well-written	remote-controlled
highly-qualified	voice-powered

- 1 The new professor is a _____ biochemist.
- 2 Many devices around the house, such as televisions and CD players, are _____.
- 3 Soon many home devices will use _____ technology, so you can tell them what to do!
- 4 Most science students do some _____ research at university.
- 5 _____ essays often get a few more marks than _____ ones.
- 6 Many countries are developing _____ trains as part of their public transport infrastructure.
- 7 Although most medicines do a lot of good, some have _____ side-effects.
- 8 Interviewers often look for students who are _____ as well as _____.

STUDY SKILL Compound nouns

A compound noun can be formed by putting two nouns together. Sometimes these are written:

- as two words, e.g. *radio waves*
- as one word, e.g. *microwave*
- with a hyphen, e.g. *data-processing*.

Use a dictionary to check how to write them.

STUDY SKILL Compound adjectives

A compound adjective can be made with:

- a noun + adjective, e.g. *computer literate*
- an adjective + present/past participle, e.g. *easy-going*
- an adverb + present/past participle, e.g. *well-known*
- an adjective + noun, e.g. *blue-eyed*

Use a dictionary to check how to write them.