

# 3 Science and technology

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**global warming** /'gləʊbəl 'wɔːmɪŋ/ Noun uncount  
**global warming** is the gradual and dangerous increase in the temperature of the Earth, caused by things such as the burning of coal, petrol, etc  
*global warming is the biggest problem we face at the moment | just because it's snowing doesn't mean that global warming isn't happening | scientists are agreed that we need to act to stop global warming*

**only a matter of time** /'əʊnli ə 'mætər ɒv taɪm/ Phrase  
 if you say that it is **only a matter of time** before something happens, you mean that it is almost certain that it will happen  
*it's only a matter of time before someone works out how to do it | if he hasn't succeeded yet, it's only a matter of time until he does | another economic crisis is only a matter of time*

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**appropriate** /ə'prəʊpriət/ Adjective  
 something that is **appropriate** is suitable for a particular purpose or situation  
*shouting at your teacher is not an appropriate way to show you disagree | the only appropriate response is to say you're sorry | is this an appropriate use of the money? | we need to decide whether further action is appropriate*  
 Adverb: *appropriately* || Opposite – Adjective: *inappropriate*  
*you should dress appropriately for the occasion | this method works well when used appropriately | inappropriate behaviour can lead to a student being sent home early | several comments on the blog post were considered to be inappropriate and were removed*

**congestion** /kən'dʒestʃ(ə)n/ Noun uncount  
**congestion** is a situation when there is so much traffic on the roads that vehicles can only move very slowly and spend a lot of time not moving at all  
 severe congestion | ease congestion  
*the radio warned us of congestion on the roads into Manchester | the bridge was closed, causing severe congestion on the roads nearby | the government brought in controls on car use to try and ease congestion | traffic congestion is a serious problem here*  
 Adjective: *congested*  
*Oxford's roads are congested, polluted and dangerous | plan your journey in advance to avoid congested areas | the congested streets of New York*

**epidemic** /ˌepɪ'demɪk/ Noun  
 when there is an **epidemic**, a serious disease affects a large number of people at the same time

*the flu epidemic of 1919 | the epidemic spread very rapidly into neighbouring countries | the epidemic caused at least 1000 deaths | they suffered epidemics throughout the 19th century*

**era** /'ɪərə/ Noun  
 an **era** is a long period of time that has a particular feature or characteristic  
*back in the Soviet era, there weren't many cars on the roads in Russia | the Internet era took off in the 1990s | the industrial era | the era of social media has just begun*

**famine** /'fæmɪn/ Noun  
 a **famine** is a period of time when there is not enough food to supply a large area and many people become ill or die  
*the district suffered a severe famine in 1770 | the Irish famine of 1846–1847 | approximately 3 million people died during the famine | governments need to do more to prevent famine*

**hungry** /'hʌŋɡri/ Adjective  
 if you are **hungry**, you want to eat something. If people **go hungry**, they do not have enough food to live a healthy life  
 go hungry  
*my mother often went hungry to make sure we children had enough to eat | close to a billion people go hungry in the world every day | if children go hungry, their bones won't develop properly*  
 Noun: *hunger*  
*one of the main problems in the village is hunger*

**nanotechnology** /'nænəʊteknɒlədʒi/ Noun  
**nanotechnology** involves making and using things that are extremely small by controlling and moving individual atoms or molecules  
*scientists have made great progress with nanotechnology | cheaper food might be possible with the help of nanotechnology | nanotechnology is increasingly important in medical research*

**peak** /piːk/ Noun  
 the **peak** of something is the time when it is biggest or most successful  
 hit/reach a peak  
*the prison population hit a peak of 450,000 in 2006 | inflation reached a peak of 15% last year | share prices have risen to an all-time peak | the peak period for tourism | the price of petrol has fallen from its peak of £1.49 a litre | a young tennis player who hasn't reached his peak yet | Murray is at his peak now*  
 Verb: *peak*  
*interest rates peaked at 16% | the band's popularity peaked in the 1990s | oil production will soon peak and then decline*

**pesticide** /ˈpestɪsaɪd/ Noun

**pesticides** are chemicals that are used to kill insects and stop them from eating crops that farmers are growing

*better pesticides helped boost food production | I don't use pesticides in the garden | some of the pesticide was washed off the soil into the river*

**starve** /staː(r)v/ Verb

if people **starve**, they have so little food that they become seriously ill or die

starve to death

*if we don't send help, a million people will starve to death there | we starved for weeks until finally food arrived by ship | he was starved and kept in a cell for months | millions were starving during the war*

Adjective: *starving* | Noun: *starvation*

*the papers carried photos of starving children | many villagers died of starvation*

**turn down** /tɜːn daʊn/ Phrasal verb

if you **turn down** a piece of equipment, you make it work less hard so that it becomes quieter, cooler, less bright, etc

*could you turn the lights down, please? | it's too loud – turn it down! | I'm just going to turn down the heating*

Opposite – Phrasal verb: *turn up*

*I can't hear the radio – can you turn it up? | it got too cold so we turned up the heating | do you mind if I turn up the volume (make the sound louder)?*

**PAGES 36–37****bond** /bɒnd/ Verb

if things **bond**, or if you **bond** them, they become firmly stuck to each other

*the two panels are bonded together using a very strong glue | a layer of pure silver was permanently bonded to the surface | the two items will bond within five minutes*

Noun: *bond*

*if the bond is not strong enough, the panel will come apart*

**brick** /brɪk/ Noun

**bricks** are solid blocks that are laid on the ground, then put together one on top of another in order to make walls and build houses

lay bricks

*a brick building | he had a job laying bricks (putting them in place) | the houses were built of red bricks | a pile of bricks | a brick wall*

**cardboard** /ˈkɑː(r)d,bɔː(r)d/ Noun uncount

**cardboard** is very thick, stiff paper used to make boxes

*a cardboard box | we can recycle cardboard here but not plastic bottles | cardboard won't burn easily when it's wet | he used cardboard to make a model ship*

**cartridge** /ˈkɑː(r)trɪdʒ/ Noun

a **cartridge**, or an **ink cartridge**, is a container for powdered ink that is used in office or home printers

*a replacement cartridge | the ink cartridge is empty | can you believe how much the cartridge cost? | the cartridge should last at least three months*

**charger** /ˈtʃɑː(r)dʒə(r)/ Noun

a **charger** is a device that puts electricity back into batteries so that you can use them again. Batteries that let you do this are called rechargeable batteries

*can I borrow your phone charger? | I bought a battery charger for my camera | unplug the charger when it's not in use*

Verb: *charge*

*I need to charge my phone*

**concrete** /ˈkɒŋkri:t/ Noun uncount

**concrete** is a solid substance used for building, made from water, sand, small stones and cement

*the kitchen floor is concrete | a concrete road surface | the tunnel had concrete walls*

**customised** /ˈkʌstəmaɪzd/ Adjective

something that is **customised** has been specially made for a particular customer

*customised products are very expensive | many insurance companies offer fully customised services | the kitchen had customised units along one wall*

Verb: *customise*

*the restaurant customised a menu for our party | you can customise the setup of your computer before you buy it*

**hook** /hʊk/ Noun

a **hook** is a curved piece of metal, wood, or plastic that is attached to a vertical surface such as a wall or door, where you can hang a coat, jacket, hat, etc

*a coat hook | leave your jacket on the hook there | you can use the hook behind the door | is there a hook where I can put my hat?*

**layer** /ˈleɪə(r)/ Noun

a **layer** is a flat amount of something that covers something else, or that is between two other things

a layer of something

*the 3D printer builds them up layer by layer | if you peel the tape away, some layers of ink come off | the roof was a single layer of steel sheets | put a layer of potatoes in the bottom of the dish, then a layer of onions*

**mass-produce** /mæs prəˈdjuːs/ Verb

to **mass-produce** things means to make a large number of them to be sold, usually quickly and efficiently in a factory

*you can't mass-produce things with a 3D printer | they started mass-producing motor cars in the 1920s | it became cheaper to mass-produce them once we installed new equipment in the factory | they were mass-produced and very cheap*

Noun: *mass-production*

*before mass-production, everything had to be made by hand | the mass-production of boots for the army*

**replacement** /rɪˈpleɪsmənt/ Noun

a **replacement** is something that takes the place of another thing that you no longer have or can use  
a replacement for something

*they gave him a replacement for his watch | a hip replacement (an artificial hip used to replace someone's real hip) | replacement car parts | some of the furniture requires replacement | several of the sales team are leaving, so we'll have to find replacements for them | if a suitable replacement is not available, a full refund will be issued | a replacement TV*

Verb: replace

*we need to replace the batteries | the V8 engine was replaced by a new unit | a brick wall replaced the old wooden fence*

**set** /set/ Verb

when a liquid or a soft substance **sets**, it becomes hard and solid

*some materials set naturally | it takes several hours for the concrete to set | wait a few minutes for the glue to set | I put the jelly in the fridge to make it set faster*

## PAGES 38–39

**affordable** /əˈfɔː(r)dəb(ə)l/ Adjective

if something is **affordable**, it has a reasonable price that is not too expensive, so most people would be able to buy it

*affordable technology | affordable housing | mobile phones are an example of affordable technology | they're looking for an affordable flat | there isn't enough affordable housing in the city | good quality products at affordable prices | health insurance simply isn't affordable for people on low wages*

Verb: afford

*we can't afford a holiday abroad on my salary*

**cutting-edge** /ˈkʌtɪŋ ɛdʒ/ Adjective

**cutting-edge** techniques or products are the very latest and most advanced that are available

*cutting-edge technology | cutting-edge video equipment | social media is no longer cutting-edge | she is conducting cutting-edge research*

Noun: cutting edge

*their research is at the cutting edge of 21st century science*

**eco-friendly** /iːkəʊ-ˈfrendli/ Adjective

something that is **eco-friendly** does not cause damage to the environment

*an eco-friendly electric car hire scheme | an eco-friendly tourist agency offering cycle tours | an eco-friendly alternative to air travel*

**economical** /iːkəˈnɒmɪk(ə)l/ Adjective

something that is **economical** does not need a lot of money or energy to work efficiently

*it's a very economical car – it costs about 7 pence a mile to run | advertising on the web is more economical than advertising on TV | an economical method of making plastic*

Adverb: economically

*we need to manufacture our goods more economically*

**empower** /ɪmˈpaʊə(r)/ Verb

if something **empowers** someone, it helps them become independent and no longer reliant on other people or organisations

*he wanted to empower the poorer villagers of India | we empower our employees to take decisions for themselves | my grandfather was determined to empower himself by studying in the evenings*

Noun: empowerment | Adjective: empowering |

Adjective: empowered

*local involvement and empowerment is essential | the school offers an empowering environment for all students | our nation cannot be strong unless its women are fully empowered*

**handy** /ˈhændi/ Adjective

something that is **handy** is useful, efficient, and easy to use

*a handy little tool | a handy kitchen gadget | a handy app that shows you the weather forecast for the next week | it's very handy and fits into a jacket pocket easily*

**highlight** /ˈhaɪlaɪt/ Verb

if you **highlight** something, you talk or write about it in a way that draws special attention to it because you think it is important

*highlight issues/concerns/areas*

*psychologists highlight several stages that nearly everyone goes through | the report highlights four key trends in youth crime | the minister was right to highlight the issue | she also highlighted concerns about late-night traffic noise*

**labour-saving** /ˈleɪbə-ˈseɪvɪŋ/ Adjective

**labour-saving** devices do things quickly and effectively so that people do not have to spend time or effort doing them

*if you can afford it, buy a labour-saving device such as a washing machine | a kitchen full of labour-saving gadgets | labour-saving machinery*

**neat** /ni:t/ Adjective

something that is **neat** is simple and effective

*this was a neat solution to the problem | that's a neat way of looking at the issue | this is a really neat website | that's a neat idea*

Adverb: neatly

*his final paragraph neatly summarised the problem | the material is neatly divided into four separate subject areas*

**recycled** /ˈrɪːsaɪkld/ Adjective

if you **recycle** things that you no longer need or use, you send them away so that they can be treated in

special factories and used again somehow. **Recycled** things and materials are the result of this process

*a table made from recycled packing cases | we use recycled materials for our products | recycled plastic bags*

Verb: *recycle* | Noun: *recycling*

*we recycle as much as we can | you can recycle those plastic bottles | we've been recycling our old newspapers for years | we should do more to encourage recycling | recycling is an important activity*

**run on** /rʌn ɒn/ Phrasal verb

if a machine **runs on** a particular source of energy, that is the kind of energy it needs to operate properly

*the central heating system runs on oil | a car that runs on petrol | the whole village runs on solar panels*

**sewing machine** /ˈsəʊɪŋ məˈʃiːn/ Noun

a **sewing machine** is a device that you use for sewing, usually powered by electricity but sometimes by pushing a pedal with your feet or by turning a wheel with your hand

*a 60-year-old sewing machine | it was much quicker to make the curtains using a sewing machine | I'm going to buy a new sewing machine next week*

**shell** /ʃel/ Verb

if you **shell** corn, you separate the kernels (small yellow pieces) from the cob (the main part of the plant)

*a device for shelling corn*

**sophisticated** /səˈfɪstɪˌkeɪtɪd/ Adjective

something that is **sophisticated** is very complicated, advanced, and efficient

*a sophisticated solution to the problem of dirty drinking water | a sophisticated car alarm system | sophisticated electronic equipment | they use sophisticated software to identify new customers*

Noun: *sophistication*

*despite the sophistication of the app, I found it very easy to use*

**time-consuming** /taɪm kənˈsjuːmɪŋ/ Adjective

an activity or process that is **time-consuming** takes up a lot of time

*the job-interview process was time-consuming and stressful | backing up the computer is a time-consuming activity | film editing is time-consuming and expensive | writing dictionaries is a time-consuming job*

**water purifier** /ˈwɔːtə ˈpjʊəɪfaɪə/ Noun

a **water purifier** is a device that removes harmful or dirty substances from water to make it good to drink

*if you don't have a water purifier, you should boil the water before drinking it | I drink water from the tap, but only after it's been through the water purifier*

## PAGES 40–41

**adjust** /əˈdʒʌst/ Verb

to **adjust** something means to change it slightly in order to make it better or more effective

*the machine adjusts the temperature automatically | the body adjusts how much cholesterol it produces based on what you eat | you'll probably need to adjust the seatbelt | add the cream and adjust the seasoning*

Adjective: *adjustable* | Noun: *adjustment*

make an adjustment | an adjustable seatbelt/strap

*these seats are adjustable | is the temperature of the room adjustable? | these trousers have an adjustable waist | we'll try it out and see whether we need to make some adjustments*

**basin** /ˈbeɪs(ə)n/ Noun

a **basin** is an open container that you can fill with water and use for washing things

*the basin in the bathroom is blocked | a wash basin | fill the basin with water*

**code** /kəʊd/ Noun

a **code** is a sequence of letters and or numbers that are used to let you unlock something, operate an alarm, etc

*enter the code then press the button at the side | I've forgotten the code for the burglar alarm | you need to remember the code, and don't give it to anyone else*

**flicker** /ˈflɪkə(r)/ Verb

if something such as a flame or a light **flickers**, it shines in an irregular way

*the light bulb is flickering on and off | the lights on car began to flicker | if the screen flickers, switch it off then switch it back on again | the candle flickered briefly, then went out*

Noun: *flicker*

*I could see the flicker of a TV screen through the thin curtain*

**manual** /ˈmænjʊəl/ Noun

a **manual** is a small book or a document on a computer that gives information and instructions about how to use a particular piece of equipment

*a user manual | I've lost the manual for the camera | there's no printed manual, you have to read it online | the manual is available in 14 different languages | please refer to the user manual if this warning light comes on*

**my pleasure** /maɪ ˈpleɪʒə/ Phrase

you say "**my pleasure**" to someone after they have thanked you for something you have done as a way of saying that you were happy to have helped them

*"Thank you so much for your help this afternoon" – "My pleasure"*

**override** /ˈəʊvəraɪd/ Verb

if you **override** an action or decision that has already been made, you use your authority to change it or cancel it. An **override** is the action of doing this  
*these controls usually allow a manual override | there is an override code, but I need to get it from the manager*

Verb: override

*federal laws override any local laws | she decided to override his earlier decision*

**pop over** /pɒp 'əʊvə/ Phrasal verb

if you **pop over** somewhere that is not very far away, you go there quickly and not for a long time  
*could you pop over and look at my bike some time? | I'm just popping over to see Auntie Jenny. Won't be long | I was just about to pop over and see you*

**purchase** /'pɜː(r)tʃəs/ Noun

**purchase** is the act of buying something. A purchase is something that you have bought

*an impulse purchase (something you buy suddenly without planning to buy it) | I went home with my purchases | they put pressure on us to make a purchase | the receipt shows the date of purchase | local restaurants offer delicious food for purchase | the full purchase price will be returned, excluding shipping costs*

Verb: purchase | Noun: purchaser

*the original property was purchased in 1933 | do you recommend purchasing tickets in advance? | the house was sold to a private purchaser | we are negotiating with a number of potential purchasers*

**refund** /riːfʌnd/ Noun

if you get a refund, a shop gives you back the money you paid for something because it is broken or does not work properly. You can also get a refund if you have accidentally paid too much for something or if you have paid for a service that was not properly provided

claim/request/demand a refund | receive/obtain/get a refund

*he took the watch back and they gave him a refund | I got a tax refund | passengers can claim a refund if they are delayed more than two hours | we received a refund after we complained to the manager | return order within seven days for replacement or refund if goods are unsatisfactory*

Verb: refund

refund monies/money

*the amount you paid will be fully refunded | we will refund all monies you have paid us | we will only refund tickets if the performance has been cancelled*

**signal** /ˈsɪɡn(ə)/ Noun

a **signal** is electrical waves that carry sound and pictures to mobile phones, computers, etc.

*I can't hear you very well, there's a really bad signal here | I can never get a signal in the back garden | there's no signal on the island, so I'll send you a postcard! | the wi-fi signal is very weak on the fourth floor*

**tip** /tɪp/ Noun

a **tip** is a piece of useful advice

give someone a tip

*each speaker offers a travel tip | do you have any tips on where to stay in Volgograd? | she gave me a few tips about the German railways system | if you want any gardening tips, ask my uncle Stan | a few tips on how to make your computer run faster*

**undo** /ʌn'duː/ Verb

if you **undo** something that is tied or fastened together, you loosen it or release it so that it can open

*he undid the strap round the suitcase | he undid the top button on his shirt | the knot was so tight I couldn't undo it*

**upgrade** /ʌp'greɪd/ Noun

an **upgrade** is a change to a better or more recent form of something that you already have

*do you need help to install the upgrade? | my laptop needs an upgrade | I downloaded an upgrade from the Internet | I can get an upgrade for my phone next month*

Verb: upgrade

*I want to upgrade my phone to the latest version | can I upgrade my laptop to Windows 10? | we'll be upgrading the website at the end of the month | the airline upgraded me to first class*

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**flex** /fleks/ Verb

if you **flex** a muscle or a part of your body, you move or bend it slightly, often as a part of doing exercise

*if I flex my muscles, the artificial hand opens and closes the fingers | lie on your back and flex your knees | he held up his hands and flexed his fingers*

**prototype** /ˈprəʊtətaɪp/ Noun

a **prototype** is the first example of a device or machine to be made. It is tested to see if it works well and changes are made to it if necessary, after which large numbers are made to be sold

*this is the prototype, and we start production next month | the prototype collapsed during testing | we're still developing the prototype | the prototype flew for the first time last year | we're still at the prototype stage but hope to start production next year*

**range** /reɪndʒ/ Noun

a **range** is the limit of what someone is able to do or afford. If something is **within** your **range**, you can afford it. If it is **out of** your **range**, it costs more money than you are prepared to pay

*at £1,200 it's within range of most families | it's nice, but it's out of my range, I'm afraid | it was the only laptop within my range*

**underserved** /ʌndəsɜːvd/ Adjective

if a group of people are **underserved**, they do not have access to as much help or assistance as most other people

*children are still underserved by the prosthetics industry | they live in an underserved area, with no hospital within 40 miles | we are trying to improve things for underserved groups*

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**emit** /i'mɪt/ Verb

to **emit** harmful gases or other substances is to release them into the atmosphere

*we need to produce electricity without emitting CO2 | using wind power means we won't emit dangerous gases | the explosion emitted clouds of poisonous gas into the air*

Noun: *emission*

*a reduction in greenhouse gas emissions | carbon emissions are at a dangerous level*

**storage** /stɔːrɪdʒ/ Noun uncount

**storage** is the activity of keeping something in the same place over a period of time so that it is available for you when you need it

*there's a lot of storage space above the garage | the energy storage market is about to boom | research into carbon storage | improved energy storage will bring a long-term benefit*