

*Cambridge*

*OL- IGCSE*

*ICT*

*CODE: (0417)*

*Chapter 10*

*Communication*



## 10.1 Communication with other ICT users using email

### 10.1.1 Characteristics, uses and constraints

Emails are now one of the most common ways of communicating between people.

#### Legislation

Many countries have laws to protect people against the misuse of emails. Figure 10.1 is a guideline on what these laws often require companies and individuals to do when sending out emails.

#### Acceptable language

The language used by people when writing emails should follow an acceptable code of practice. The following is a list of unacceptable content to be used in emails, text messages and online forums:

- » Obscene images
- » Language that is regarded as abusive, profane, inflammatory, coercive, defamatory or blasphemous
- » Racist, exploitative or violent messages » use of illegal materials or messages.

#### Guidelines set by an employer

It is imperative that any company (no matter how small or large) that employs people publishes guidelines regarding use of emails and other electronic communications. Guidelines must follow the laws in the particular country in which the company operates.

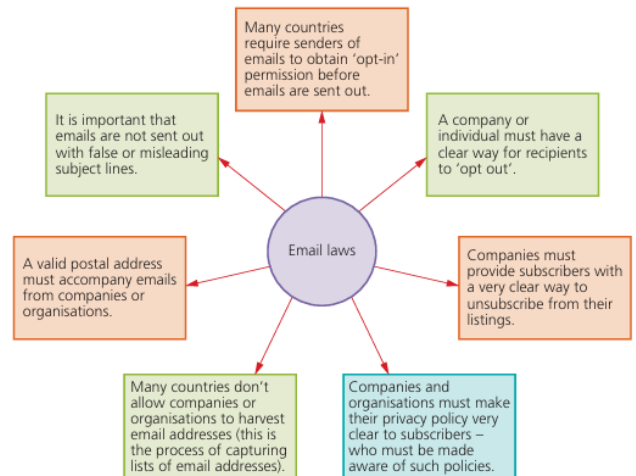
#### Copyright and security of emails

It is very important to realise that emails are subject to copyright laws. Just because it is relatively easy to forward an email does not mean it is always legal to do so. This is also true of any attachments sent with an email. As with web pages, the copyright in an email is determined by its content.

#### Security and password protection

Some methods of increasing the security of emails include:

- » Using strong passwords when logging on to your email account
- » Changing passwords on a regular basis
- » Using spam filters to remove certain suspicious emails to a 'junk folder' or even to block the email entirely



▲ Figure 10.1 Email Laws

» Running anti-virus and anti-spam software at all times on your computer, to protect against emails from unknown or malicious sources.

Emails are said to be vulnerable to both **passive** and **active attacks**. Passive attacks include the release of email material to other users without your consent.

### Netiquette

Netiquette is a shortened form of the phrase **interNET etIQUETTE**, which refers to the need to respect other users' views and display common courtesy when posting views in online discussion groups or when sending out emails. It is very important to consider what you write always, because the reader cannot see your facial expressions or body language.

Email groups Email groups are used for a number of purposes:

- » It is easier for a user to send out multiple emails if the addresses are all grouped together under a single name; the user only needs to use that single name in the 'to' box.
- » Companies and organisations can group people together for marketing purposes, for example according to age, hobbies, favourite music and so on – this means that each email can target specific groups.
- » 'Spammers' can create email groups by buying addresses of people from certain companies or from software that 'raids' address books on computers or email companies – this means that several thousand people can be sent spam at one time.
- » Companies use email groups to set up meetings (for example, for a video conference) to ensure that everybody is always invited to attend – it would be easy to forget a person if the email addresses were all typed in individually; this way you can be sure all the correct recipients are sent messages.

### Other email operations

Apart from the person you are sending the email to, there are other options available, such as:

- » Carbon copies (cc)
- » Blind carbon copy (bcc)
- » Forward
- » Attachments.

### Carbon copies (Cc) and Blind carbon copies (Bcc)

The difference between carbon copies (Cc) and blind carbon copies (Bcc) is that the Bcc address details are invisible to everyone receiving the email, apart from the Bcc recipient. All recipients in a Cc list, however, can be seen by all other recipients.

When sending an email to many recipients, the following is an added security to keep the addresses of everyone safe:

- » Put your own email address in the 'To' field.
- » Set up an email group containing all the recipients and give it a name; then store this.
- » Put this named email group in the 'Bcc' field.

» This will provide some additional protection, because anyone seeing the email (authorised or unauthorised) will not be able to see the email addresses of the individual recipients.

### Forwarding of emails

You have decided to forward all of your emails to dave24 68@yahoo. com where you can read them at your leisure. This means that all your emails, including spam, will be sent to this yahoo address. Two problems exist here:

1. Some internet service providers (ISPs) do not recognise the true source of emails and regard all emails as actually coming from the ho thouse-d esign.co.uk domain, including spam, because they will have been forwarded from that domain.
2. Some ISPs have spam filters in place based on email volumes from just one address.

### Attachments

It is also important to remember when sending attachments that the ISP will have a limit on the size of file that can be sent. Emails were never intended to include large files. It is probably better to look at alternatives when sending large files, such as:

- » File compression (zip files)
- » Selecting a web service that allows files to be transferred: upload the file(s) and then create a link. This link can be sent in an email and the recipient can then easily download very large files by clicking on it.

### 10.1.2 Characteristics and effects of spam

Any unsolicited email sent over the internet is regarded as **spam**. It is often sent to multiple recipients and can range from being simply annoying to dangerous, because spam can contain viruses or be part of a phishing scam (see earlier chapters).

While some regard spam as a cheap way of advertising to many people at the same time, most people consider it to be a big nuisance. The main disadvantages are:

- » It uses up people's time.
- » It generally annoys people.
- » It uses up valuable bandwidth on the internet, slowing it down.
- » It can have viruses attached or even be part of a phishing scam.
- » It can clog up users' inboxes.

## 10.2 Effective use of the internet

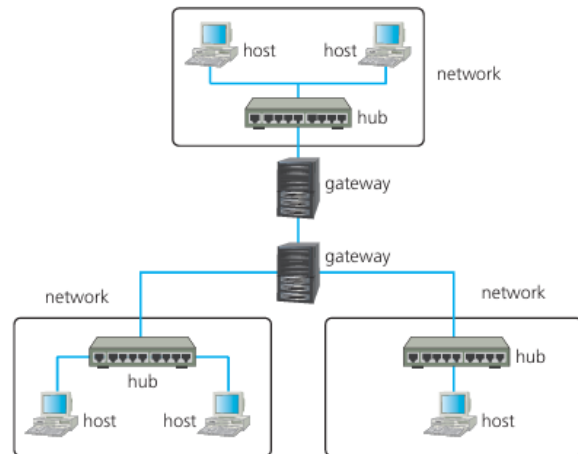
This section will consider the effective use of networks, such as the internet, intranets and extranets. This will include many of the features of each type of network.

## 10.2.1 Characteristics, uses, advantages and disadvantages of the internet

### The differences between the internet and the World Wide Web (WWW)

The word internet comes from **INTERconnected NETWORK**, because it is basically a worldwide collection of interconnected networks. The internet as a whole is actually a concept rather than something tangible (that is, something we can touch).

In contrast, the **World Wide Web (WWW)** is only a **part** of the internet which users can access **using web browser software**. The World Wide Web consists of a massive collection of web pages, and has been based on the hypertext transfer protocol (http) since 1989. The World Wide Web is a way of accessing information using the internet.



▲ **Figure 10.4** Diagram of the internet

▼ **Table 10.1** Summary of differences between the internet and the World Wide Web

Internet	World Wide Web (WWW)
» users can send and receive emails	» it is a collection of multimedia web pages and other information on websites
» allows online chatting (via text, audio and video)	» uses http(s) protocols to send hypertext markup language (HTML) documents
» makes use of transmission protocols (TCP) and internet protocols (IP)	» uniform resource locators (URLs) are used to specify the location of web pages
» it is a worldwide collection of interconnected networks and devices	» web resources are accessed by web browsers
	» WWW uses the internet to access information from web servers

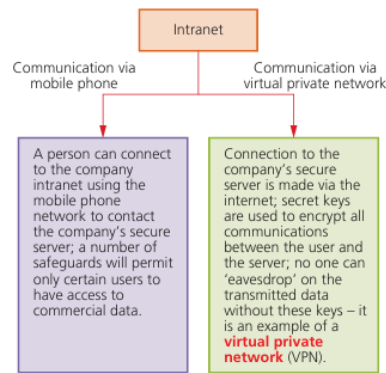
### Intranets and extranets

Many companies use an intranet as well as the **internet**. Intranets reside behind a firewall and are only accessible:

» Internally to members of the company, or

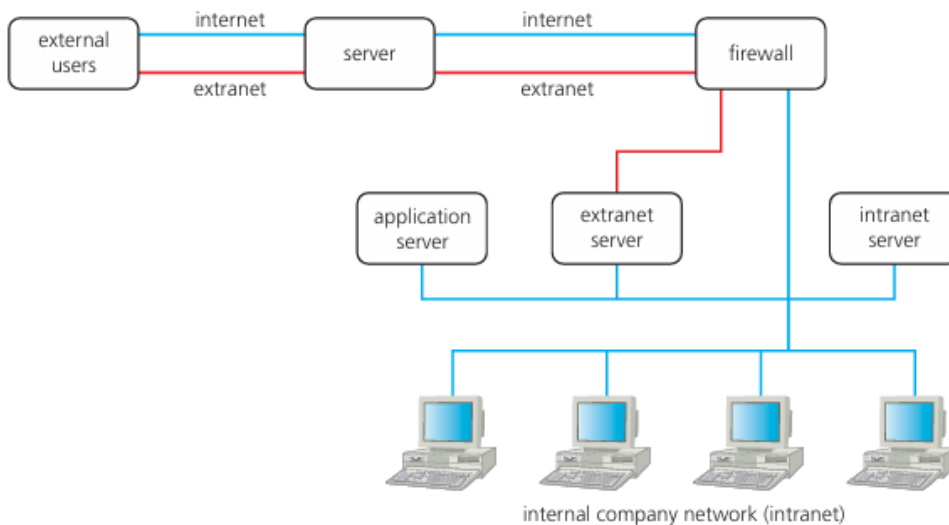
» To people given various levels of access who are external to the company (see later). There are a number of reasons for adopting intranets rather than using the internet:

- » Intranets are safer because there is less chance of external hacking or viruses.
- » It is easier to prevent external links to, for example, certain websites.
- » Companies can ensure that the information available is specific to their internal audience's needs.
- » It is easier to send out sensitive messages in the knowledge that they will remain within the company.
- » Intranets offer better bandwidth than the internet, therefore there are fewer connection limits than with the internet (that is, the number of bits per second that can be transmitted are usually higher within an intranet).



▲ **Figure 10.5** Connecting to an intranet through a mobile phone network or virtual private network

It is also possible to create **extranets** that allow intranets to be extended outside the organisation, but with the same advantages as an intranet; this allows,



▲ **Figure 10.6** Connections between internet, intranet and extranet

What are the differences between the internet and an intranet?

- » As discussed, the term internet comes from the phrase: INTERconnected NETwork.
- » The term intranet comes from the phrase: INTERNAL Restricted Access NETwork.
- » An intranet is used to give local information relevant to the company or organisation; whereas the internet covers everything.
- » It is possible to block out certain websites using the intranet; while this is also possible with the internet, it is more difficult.

» An intranet often requires a password and user ID, and can only be accessed from agreed points/computers; whereas the internet can be accessed by anyone from anywhere in the world, provided the user has an ISP account.

» An intranet is behind a firewall, which gives some protection against hackers, viruses, and so on; there is much less protection against hackers and malware when accessing the internet.

» Information used in intranets is usually stored on local servers, which makes it more secure from outside users for the same reasons as above.

### Blogs, wikis, social networking sites and forums

#### **Blogs**

Web logs (blogs) are personal internet journals where the writer (blogger) will type in their observations on a topic (for example, a review about the latest movie release) and perhaps provide links to some relevant websites

Features of blogs:

- » Updated on a regular basis by the author
- » Usually organised in reverse chronological order (most recent to least recent entry)
- » Normally public – anyone can read them
- » Entries normally come from a single author
- » Other internet users cannot change blogs – they can only read them

**Microblogs** are similar to blogs, but are most often used on social networking sites to make short, frequent posts. The posts can be done using instant messaging, emails or use other social networking vehicles (such as tweets).

#### **Wikis**

Wikis are web applications or websites that allow any user to create and edit their web pages using any web browser.

Features of wikis:

- » Anyone can edit, delete or modify the content
- » Many authors can be involved in a wiki
- » It is possible to organise a page any way the author(s) wish(es)
- » shows/keeps track of all entries – that is, stores a document history
- » Can be easily edited using a web browser » allows large documents to be seen by many people – it is easier than emailing several people

### Social networking sites

Social networking sites focus on building online communities of users who share the same interests and activities.

Features of social networking sites:

- » Each member is provided with free web space.
- » Each member can build their own private and public profiles.
- » It is possible to upload content such as text messages, photos and videos.
- » It is possible to 'write on each other's walls'.
- » Members are given free instant messaging and video chatting.

- » It is possible to email other members within the community.
- » Members can create pages where they can post photos, articles, and so on.
- » It is possible to invite people to become friends.
- » Members have control over who can access their private or personal data.

## Forums

A **moderated forum** refers to an online discussion forum in which all the posts are checked by an administrator before they are allowed to be posted.

The internet is essentially a huge **unmoderated forum**. No one 'owns' the internet, and it is essentially not policed.

## 10.2.2 Functionality of the internet

This section will consider how it is possible to access the internet and use some of its features.


### Internet service providers (iSP)

An internet service provider (ISP) is a company that provides users with access to the internet. It is normal to pay a monthly fee for this service. When a user registers with an ISP, an account is set up and they are given login details that include a user ID and password.

### Web addresses, URLs, hyperlinks and web browsers

A web browser is software that allows a user to display a web page on their computer screen. They interpret or translate the HTML from websites and show the result of the translation. This can often be in the form of videos, images or sound.

Most web browsers share the following features:

- » They have a home page.
- » They have the ability to store a user's favourite websites/pages (known as bookmarks).
- » They keep a history of the websites visited by the user (known as user history).
- » They allow users to **navigate** backwards and forwards through websites.
- » They have **hyperlinks** that allow users to navigate between web pages; these hyperlinks are shown as **blue underlined text** or use a small picture, such as a pointed finger , under a phrase or image; by clicking on these hyperlinks the user is sent to another website or web page.

Web browsers use **uniform resource locators (URLs)** to access websites, retrieve files, and so on. URLs are text addresses used to access websites. A URL is typed into a browser address bar using the following format:

**protocol://website address/path/filename**

where:

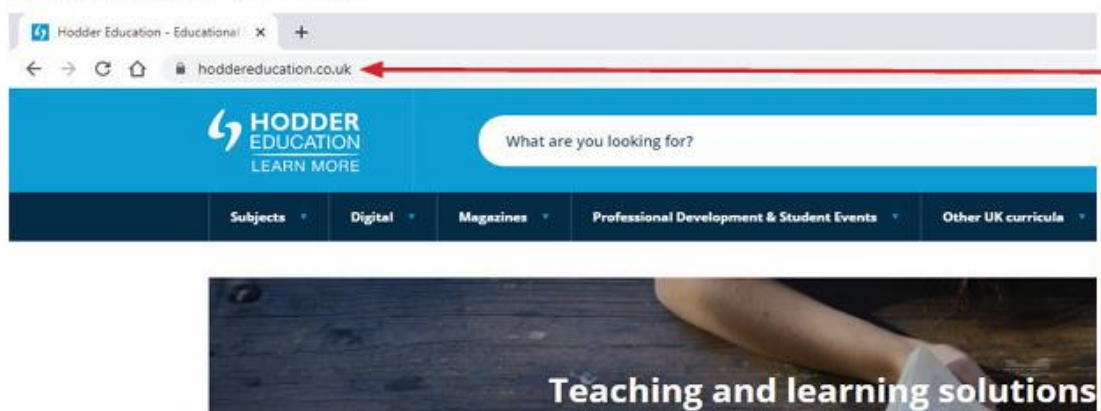
- » **protocol** is usually either **http** or **https**
- » **website address:**
  - **domain host** (www)
  - **domain name** (name of website)
  - **domain type** (.com, .org, .co, .net, .gov)
  - sometimes a **country code** (.uk, .us, .de, .in, .mu, .cn)
- » **path**, which is a web page (if omitted then it is the root directory of website)
- » **filename** is the item on the web page.



### 10.2.3 Use of search engines

There are basically two ways of locating information from the internet. The first way is to type in the URL if you know the name of the website you wish to access. The second method is to use a **search engine** if you do not know where to find the information you are looking for.

## Opening a website from a URL

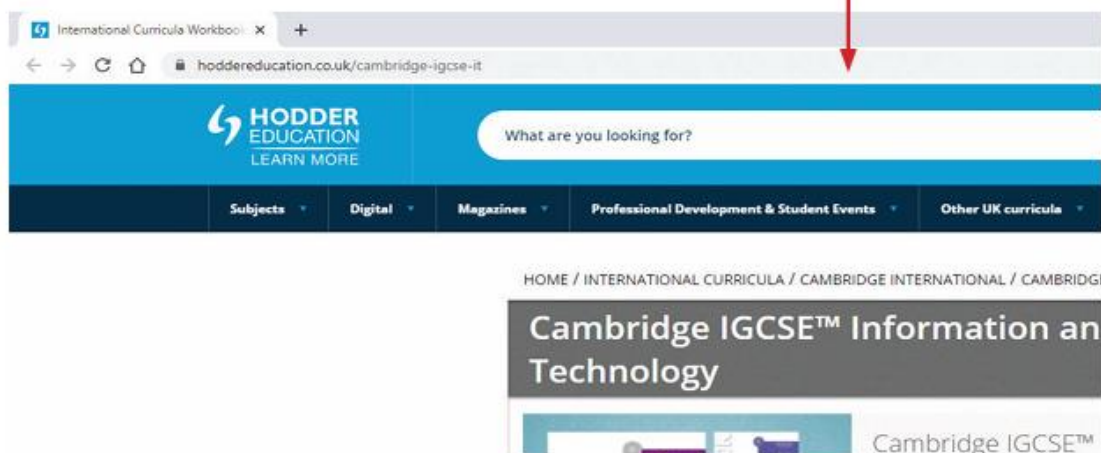


▲ **Figure 10.7** The home page for the website <https://www.hoddereducation.co.uk/>

As discussed, the URL contains the protocol, site address and file name. If you type in: <https://www.hoddereducation.co.uk/> to a web browser as shown here, you will go to the home page for the website.

If you know the URL for a page within the website, you can type the full entry into the web browser to get a particular page. For example, if you want the IGCSE ICT page within the website, you could type in the full URL: <https://www.hoddereducation.co.uk/cambridge-igcse-it> to get the page shown in Figure 10.8.

If you want to use this page frequently, you can add it to your favourites which saves you having to type in the URL every time.

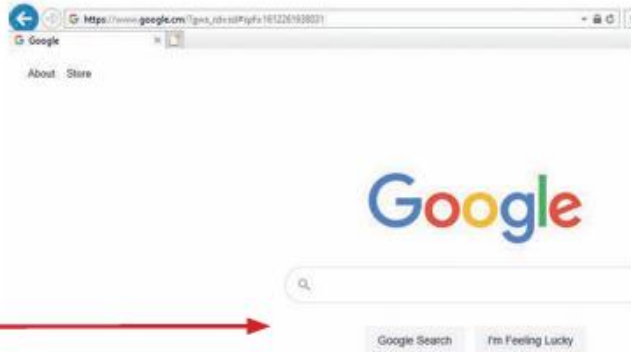


▲ **Figure 10.8** The IGCSE ICT page

It is also possible to search through the website using the navigation tools until you find the web page you are looking for.

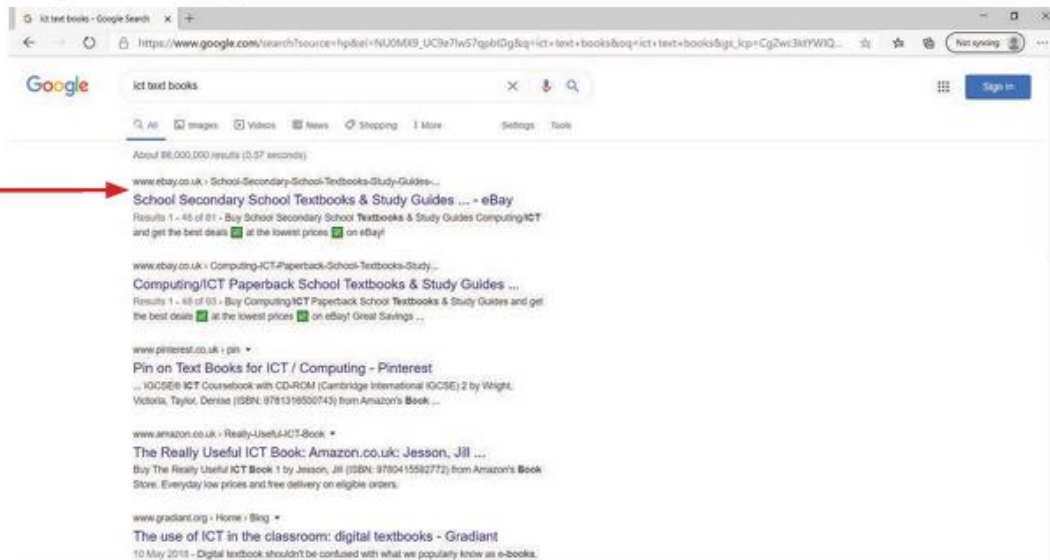
### Opening a website via a search engine

**Search engines** are useful if you do not know the URL of the website, or if you want to find some information but do not know where to look. Many search engines exist, and they search for websites using a variety of methods, but they all have one common underlying feature: they look up the words entered in the search box in their database of web pages to find out which of them match the search string or criteria. The more detailed or specific your search string, the more accurate the results (known as 'hits') will be.



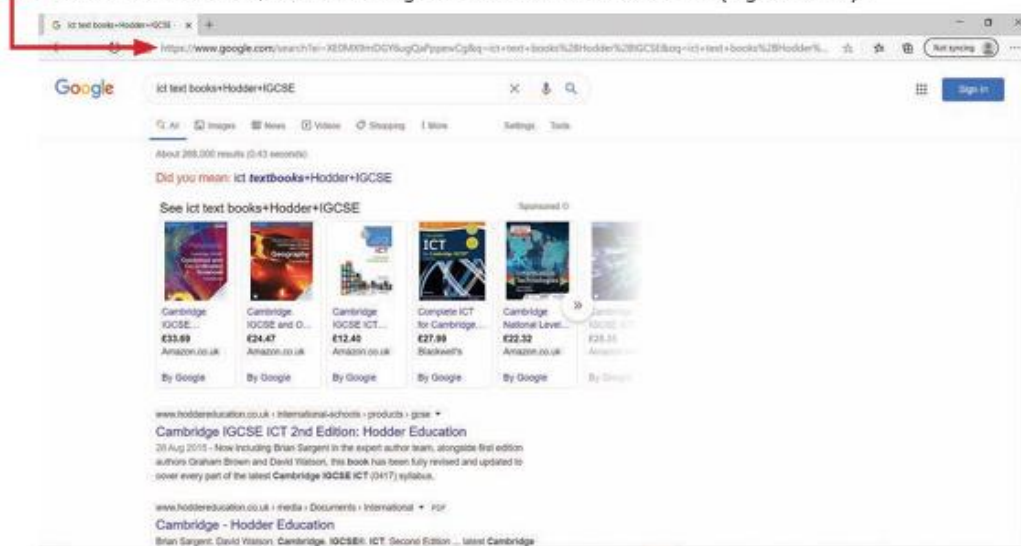
▲ **Figure 10.9** A typical search engine

For example, if we type 'ICT text books' into a typical search engine, the options in Figure 10.10 will appear.



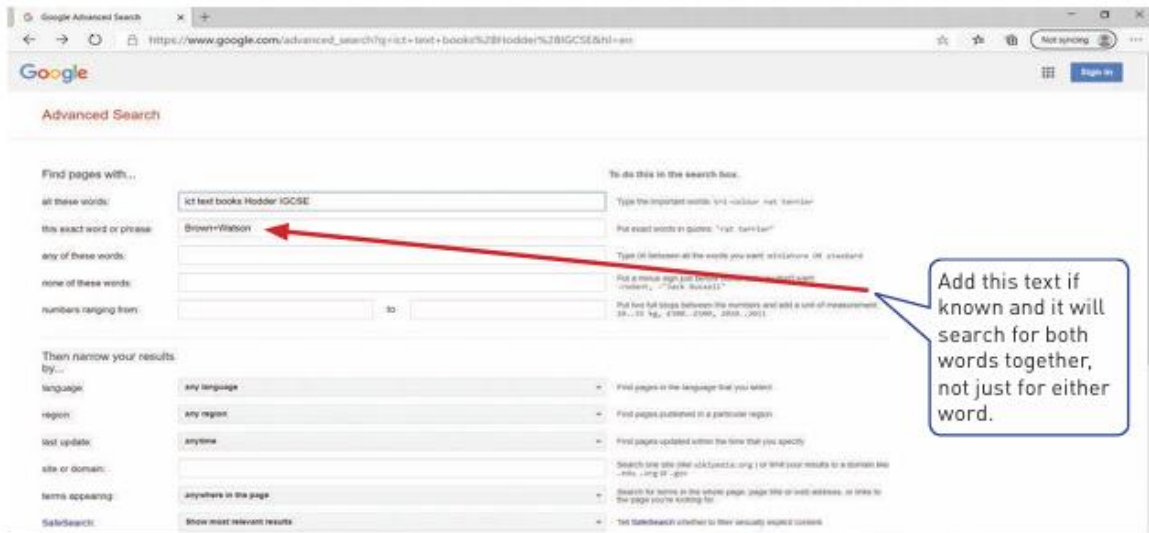
▲ **Figure 10.10** Initial search for 'ICT text books'

As you can see, about 86 million 'hits' or web pages have been found. This is a lot of information. We could narrow down the search by now typing in 'ICT text books+Hodder+IGCSE', and we now get a much-reduced selection (Figure 10.11).



▲ Figure 10.11 Reduced selection of search results

We now have reduced the number of web pages to 268 000, which is a vast reduction. However, the search can be further refined using the advanced search option, as shown in Figure 10.12.



▲ Figure 10.12 Using the advanced search option

The result is now only about 300 hits.

It is **very important** to acknowledge your sources of information when using information from a website in your own work, both to avoid plagiarism and because the information will be subject to copyright.

#### Advantages of using the internet to find information

- » Information on the internet tends to be up to date because it is quicker and easier to amend web pages than it is to, for example, reprint books.
- » The internet has vast, almost limitless, amounts of information.
- » Searching for information using a search engine is fast and easy.
- » People can look for information in the comfort of their own home – there is no need to travel to a library to find required books.
- » Information on the internet is essentially free of charge.
- » Pages on the internet can have multimedia elements (for example, videos, animations, cartoons and music/voiceovers) that make learning more interesting and often makes it easier to understand the topics.

#### Disadvantages of using the internet to find information

- » The internet is not regulated – anything can be posted on a web page and, consequently, information may be biased or totally incorrect (books, on the other hand, usually undergo some form of review before being published).
- » There is always the risk of accessing inappropriate websites when using search engines; these can take many forms and can be very distressing to certain people.
- » It is too easy to be distracted when searching on the internet – users can find computer games or enter social networking sites instead of doing their work.
- » There is always the risk of ‘information overload’ if the user lacks the necessary experience or expertise when using search engines.
- » Because it is very easy to copy material from the internet, there is a huge temptation to plagiarise material; this is more likely to occur than when using books.
- » Some research skills are lost when using the internet as search engines do all the work for you.

#### Why internet searches are not always a fast way of finding information

When using search engines, there is always the danger of information overload. It is possible to find millions of websites that match the given criteria. Unless the user narrows down their search criteria, it can take a long time to find out exactly what they are looking for (see Figures 10.9 to 10.11). Also, if the user is uncertain of what needs to be asked, it can take a long time to obtain only relevant information.

10.2.4 How to evaluate information found on the internet There are six criteria to consider when evaluating information found on the internet:

1. Is it possible to verify the legitimacy of who wrote the material posted on the website? Does the information come from a reliable source that can be verified?
2. Is there a way to check if the information is factually correct; can it be verified from another source; is it grammatically correct and free of spelling mistakes?

3. Is the article objective? Is there any evidence of bias (for example, does it contain links to organisations to support the 'bias' in the article and does it contain any advertising which reinforces the bias in the article)?
4. Is the information dated? When was it last reviewed and by whom?
5. Does the article cover all aspects and are all the arguments fully supported either by information supplied or references to external experts, or external links to well-respected organisations (such as universities)? 6 Does the website look legitimate? Do all the links in the website still work?

### 10.2.5 Internet protocols

Protocols are sets of rules agreed by the 'sender' and 'recipient' when data is being transferred between devices.

#### Hypertext transfer protocol (HTTP)

Hypertext transfer protocol (HTTP) is a set of rules that must be obeyed when transferring website data across the internet. When a web page is being accessed, entering <http://> at the front of an address tells the web browser that 'http rules' for communication are to be obeyed

#### File transfer protocol (FTP)


**File transfer protocol (FTP)** is a network protocol used when transferring files from one computer to another computer over the internet. It is similar to HTTP, but the protocol is specifically for the transfer of files.

Web browsers can be used to connect to an FTP address in much the same way as you would connect to an HTTP address, for example:



<ftp://username@ftp.example.gov/>

#### Secure sockets layer (SSL)

**Secure Sockets Layer (SSL)** is a protocol that allows data to be sent and received securely over the internet.

SSL is designed to work with communication protocols like HTTP and FTP. When used with HTTP, a user logs onto a website as normal, but SSL encrypts the data – only the user's computer and the web server are able to make sense of what is being transmitted. As mentioned earlier, a user will know if SSL is being applied when they see **HTTPS**, or the small padlock  in the status bar at the top of the screen.

The address window in the browser when HTTPS protocol is being applied, rather than just HTTP protocol, is quite different:

Using https:	 secure	<a href="https://www.xxxx.org/documents">https://www.xxxx.org/documents</a>
Using http:		<a href="http://www.yyyy.co.uk/documents">http://www.yyyy.co.uk/documents</a>

You can refer back to Figure 8.12 (p. 210) to see what happens when a user wants to access a secure website and receive and send data to it.

### 10.2.7 Internet risks

Many of the risks associated with using the internet have been raised in this and earlier chapters. As long as users take all of the precautions covered in this book, they should find the internet a safe, enjoyable and very useful source of entertainment and material.

## Revision questions

1. Nov/2021/Paper\_11/No.12

The use of social networking is a part of modern living. (a) Define the term social networking.

(b) Describe the benefits of using social networking.

2. Nov/2021/Paper\_12/No.10

Many young people now use social media rather than other forms of communication.

Evaluate your own use of social media and explain any eSafety strategies you could use to help minimise the potential dangers.

3. Mar/2021/Paper\_12/No.5

A parent is concerned about his children sending texts. When sending a text, it is important to follow netiquette.

(a) Explain what is meant by the term netiquette.

(b) The parent is planning to produce a number of rules to ensure that his children follow netiquette when texting other people. Write down four rules that he could include in his list.

4. June/2021/Paper\_13/No.3

A mobile phone is used for communications, either for making phone calls or text messaging.

Chang is planning an expedition to the Southern Alps in New Zealand. There is often a limited mobile phone signal in these areas. He has set his phone up so that if there is an emergency he can communicate with the rescue teams using text messaging rather than making a phone call.

Give two advantages of using text messaging in this way.

5. June/2021/Paper\_13/No.13

A student is looking for information on the internet for his school project. He has found a number of web pages that are useful.

(a) Explain the following terms when referring to web pages:

(1) Bookmark

(ii) Anchor

(i) Hyperlink

(b) The student has found a website that is very useful and is planning to bookmark it.

Describe the steps he will need to take to set up a bookmark for the website.

6. Nov/2020/Paper\_13/No.9

Legal documents can be sent by email, as a file attachment, or by physical fax.

(a) Describe the advantages of using emails compared with physical faxing.

A legal document is sent as a file attachment.

(b) Explain the steps that need to be taken to ensure that if a virus is attached to the file, it cannot infect the computer.

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A computer virus has been downloaded from an infected file.

(c) Describe three effects this could have on a computer.



7. March/2023/Paper\_0417/12/No.4(a)

Young people use the internet for research and communication.

(a) Search engines can be used to research information on the internet.

Describe three benefits of using a search engine to find information.

8. March/2023/Paper\_0417/12/No.12(b)

A tennis coach is creating a presentation to explain to teenagers the basics of playing tennis. (b) The designer needs to be aware of copyright legislation when creating the presentation.

Explain the need for copyright legislation.

9. June/2023/Paper\_0417/11/No.4(a, b)

(a) Describe the purpose of a web browser.

(b) A company may use an intranet or an extranet.

Describe the differences between an intranet and an extranet.

10. June/2023/Paper\_0417/12/No.4

A company uses an extranet.

(a) Explain what is meant by an extranet.

(b) Describe the differences between the internet and an extranet.

11. June/2023/Paper\_0417/13/No.10

A school secretary is composing an email. She will send the email to a teacher and will copy the headteacher into the message. She can either copy the headteacher in as cc or bcc.

(a) Describe what is meant by cc and bcc.

(b) A teacher is considering setting up either a forum or a blog for his class to help his students with their studies.

Describe the benefits of using a forum rather than a blog.