

Using ICT to find, evaluate and use scientific information

Finding scientific information on the Internet

- [Introduction](#)
- [The tasks](#)
- [List of search engines](#)
- [Other sites to start searching from](#)
- [How search engines work – and their limitations](#)
- [Finding the information you want – and only that](#)
- [Children searching for information – issues and sites](#)
- [Where to learn more about search engines](#)

Introduction

There are two main ways of finding information on the Internet. The first is to use a search engine, type in your query and await a result. The second is to use a 'portal' site – that is a site which has links to numerous other, related sites.

In this section of the module your task is to use both of these methods to find information on specific science topics.

You will then send short evaluations of how easy it was to find the information you were looking for to everyone else using the FirstClass system. Since different people will be using different search engines and portal sites, the messages from the group as a whole will provide a valuable resource for everyone on which sites have been found to be best in searching for the three topics.

Through these tasks it is hoped that you will:

- increase your expertise in using a variety of search engines and portal sites to look for information on the Internet
- have greater knowledge of which search engines and portals to use when looking for different kinds of information the ease of use of various search engines
- Appreciate the issues involved when children search for information on the Internet – and the variety of ways in which these issues can be addressed.

You should start by reading details of the [tasks](#) to be completed.

The section '[Finding the information you want – and only that](#)' gives guidance on how to construct the searches required in task 1. If you have not used search engines much before, it would be useful to read this before you start.

The section '[How search engines work – and their limitations](#)' describes in outline why you get different results from different search engines. It also contains a link to a guide to which search engines to use for different kinds of searches – e.g. broad and narrow topics; educational resources; reviewed sites. Although this has a strong American bias, it should prove useful reading for everyone.

The section '[Using the Internet with children](#)' lists some issues it is important to think about before using the Internet in the classroom. It also lists two sites designed for children to search through. Again, this section is intended to be of use to everyone.

Finally, the section '[Where to learn more about search engines](#)' is intended only for those who wish to explore the use of search engines in greater detail than is possible in the time for this module.

The tasks

Task 1

i. Select two search engines from the list below and use them to find three sites on the Internet which you would use in the teaching of either

- the periodic table
- the earth in space
- genetics (particularly the Human Genome project)

(The topics have been chosen so that you can look for sites related to either chemistry, physics or biology, as you wish.)

ii. send a message to FirstClass giving:
The names of the Internet sites you have found
Their addresses (URLs)
Which search engines you used in your search
Your view on their ease of use – in particular how easy it was for you to find the specific information you were looking for.

List of search engines

Alta Vista	Google	MetaCrawler
AskJeeves	InfoSeek	Northern Light
Excite	Lycos	Yahoo

Task 2

In this task you are asked to find three additional Internet resources using 'portal' sites – that is sites which contain links to lots of other pages on the Internet in the same area.

You should choose at least one of the following sites as a starting point:

- The [Association for Science Education](#) which has an extensive collection of links to all areas of science taught in schools.
- The [Science Museum](#) which has a collection of links related to its galleries.
- The [Natural History Museum Portal](#) which is an excellent starting point for biological and earth science enquiries.

If you have time, in the [Science Links](#) page list other sites of interest in science education, some of which are also good starting points for searches. For example, the [Exploratorium](#) has a searchable list of over 10,000 pages and [New Scientist](#) allows you to search its vast collection of back articles.

When you have completed this task, you should send a message to the group via FirstClass giving:

The names of the Internet sites you have found
Their addresses (URLs)
Which portal site(s) you used in your search
Your view on how easy it was to find the specific information you were looking for.

How search engines work – and their limitations

How search engines work

Basically search engines do one of three things:

1. some (like Yahoo) hold lists of sites in categories. These are like telephone directories, a compilation of sites sent to the 'owner' of the list and vetted before addition. You search these by refining the categories within which you are looking.
2. some (like Alta Vista) crawl through the web looking for sites. You search through what they have found.
3. some (like AskJeeves) do both of the above and also look at what other search engines have found.

For these reasons (and because they use a variety of criteria to rank the sites they find) different search engines give different results and are useful for different purposes.

A useful guide to which search engine to use for which kind of enquiry can be found by going to [this link](#) and scrolling down the page. It would be interesting to compare these recommendations with your own findings.

Their limitations

Search engines suffer from a number of limitations. For example, directories only contain information about sites which have been submitted to them, and all the other sites list the results of their searches in an order which depends on how successfully the author has been at guessing the algorithm they use to prioritise pages.

However, there is a more important limitation even than these. The amount of information on the web is increasing at an explosive rate. **No** search engine can keep up to date with this. Therefore they tend to be less use in looking for *recent* documents and much more use in looking for *older* ones. This tendency is exacerbated by the fact that some search engines rank the sites they find on the basis of how many times they have listed them before, and others on the basis of how many other sites on the net are linked to the given site. Of course both of these tend to favour older sites. So - you are unlikely to find any references to today's electronic version of the Times but a number to editions which appeared last year!

[Return to the index](#)

Finding the information you want – and only that

The simplest way to search for something is to type in a single word or phrase. However, this is rarely likely to prove useful. The table below shows the number of sites found by AltaVista for some common scientific terms:

Word	No. of sites found
Environment	> 3,900,000
Genome	> 395,000
Periodic Table	> 80,000
Astronomy	> 1,600,000

For this reason it is necessary to refine your search. How this is done depends on the search engine. There are three main ways:

With directories (such as Yahoo) you select more and more detailed categories. E.g. you could select Science then Chemistry then Periodic Table then Elements. This gives a much more manageable number of sites to look at in more detail

With 'true' search engines you have to use logical operators such as '+' and '-'. E.g. Using AltaVista's 'advanced search', typing in +Education +genome found 55 pages – again a much more manageable number.

All search engines give help in constructing 'advanced search' and you can find a quick reference [guide](#) to a number of them at Florida's Instructional Technology Resource Centre.

Finally, with a 'Natural Language' search engine, such as AskJeeves, you can try writing more complicated sentences. Typing in "Where can I find information on the education aspects of the Human Genome Project?" in AskJeeves gave 26 matching sites.

[Return to the index](#)

Children searching on the Internet – issues and sites

Sites for children

The new National Curriculum makes numerous reference to children searching for information on the Internet. However, many teachers, schools and parents are wary of allowing children to search the web in an unrestricted way. If this is important to you or your school, then you could consider using the children's version of AskJeeves, [AskJeeves for Kids](#) or Yahoo, [Yahooligans](#).

Both of these provide good protection – but in different ways. For example, typing in 'tits' to Ask Jeeves for Kids led to a scientific cross-section of a female breast, while Yahooligans gave three sites of web-cameras of birds' nests.

Filtering

But it is worth pausing to consider the issues before using these sites. Most providers of Internet services to schools (e.g. Research Machines, LEAs) filter or block sites anyway and for many children the 'thrill' of looking up forbidden sites is precisely that they are forbidden. If the children are really engaged in the activity set for them then *it* occupies their attention.

Like search engines, the filters used by various Internet providers operate in three ways

1. by only letting through those sites which have been preselected (most draconian)
2. by only blocking those sites which have been designated as unsuitable (least draconian)
3. by searching sites and blocking those containing 'unsuitable' material (totally random - at one time or another these sites have blocked access to any site mentioning Scunthorpe and the on-line product of a researchers lifetime work - complete lists of the homophones and homographs in the English language.)

Teacher selection

One increasingly used alternative is for the teacher to pre-select the sites to be used in a lesson and then download them on to the school server so that while the children *think* they are using the net they never get beyond the school site. This gives you total control, but limits the children's capacity to find new information.

If this is the option you choose, you need to discuss it with your school's network administrator.

[Return to the index](#)

Where to learn more about search engines

A useful (and searchable!) list of search engines can be found at the Searchenginewatch.com site. This site also [describes how search engines work](#), holds [reviews](#) of them and [tutorials](#) in using them. Another useful tutorial can be obtained from the library of the University of California, [Berkeley](#).

[Return to the index](#)