

Subject: Computing	Year: 6 – Autumn 1 – Computer Systems & Networks –
<p>National Curriculum objectives</p> <ul style="list-style-type: none"> • Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration; • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information; • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. <p>Education for a Connected World links</p> <ul style="list-style-type: none"> • I can describe and assess the benefits and the potential risks of sharing information online; • I can assess and justify when it is acceptable to use the work of others; • I can give examples of content that is permitted to be reused. 	
<p>To begin this unit, the children should have already learnt:</p> <p><u>KS1</u> Computers are a part of IT, which is all around us and its responsible use improves our world in school and beyond. Rules and choices are needed when using information technology to stay safe.</p> <p><u>Year 3</u> Digital devices are devices that are capable of processing: they are underpinned by an IPO (input, process, output) and form part of a network, which is made of numerous devices. Information and data can be shared across networks.</p> <p><u>Year 4</u> The internet is a network of networks which needs to be kept secure. The World Wide Web is part of the internet, however, not all content on the internet is reliable.</p> <p><u>Year 5</u> Systems are created by computers and other interconnected parts working together. Search engines are used to return information on the World Wide Web: these results are ranked based on the search engine’s rules; the results from a search can also be influenced.</p>	<p>The learning in this unit will prepare the children to learn these things in the future:</p> <p>National Curriculum objectives at KS3:</p> <ul style="list-style-type: none"> • Understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem; • Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems; • Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits; • Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns.
<p><u>Key Enquiry Question</u> What rules allow computers to communicate? How is data transferred over the internet? What ways can information be shared over the internet? How does the internet enable effective communication? What method of communication would be best for (given purpose)? What types of information should not be shared – and why?</p>	<p><u>The Big Idea:</u> Data is shared over the internet in packets. The internet facilitates online communication and collaboration: different methods are available – it is important to choose the best strategy for a purpose. Communication can be public or private so choices about what to share must be made.</p>

To achieve ARE, pupils will need to be secure in the following knowledge:

By the end of this unit, children will know:

- Data is transferred across networks using agreed protocols (methods);
- Connections between computers allow access to shared stored files;
- Data is transferred in packets;
- Which types of media can be shared through the internet;
- Computers connected to the internet allow collaboration between people in different locations;
- Communicating and collaboration using the internet can be public or private.

Vocabulary:

Technology; man-made; digital; screen; mouse; keyboard; program; click; drag; e-safety; cursor; Information technology; device; barcode; scanner; communication; entertainment; appliances; signal (Introduced in KS1).

Digital device; input; output; process; connection; network; network switch; server; WAP (introduced in Y3).

Security; website; router; webpage; browser; domain; reliable; reliability; world wide web (introduced in Y4).

Reuse; explore; collaboration; system; protocol; packet; IP Address; web crawlers; search engine (introduced in Y5).

Algorithm; ranking; Tim Berners-Lee; keyword; browser.

By the end of this unit, children will be able to do:

- Describe and outline method of communicating and collaborating using the internet;
- Choose the best method of internet communication and collaboration for a purpose;
- Evaluate different communication and collaboration methods;
- Decide what you should and should not share online.

Useful Resources:

[Teaching Computing Systems and Networks to 5- to 11-Year-Olds](#)

COMPUTING SYSTEMS AND NETWORKS KNOWLEDGE ORGANISER

Overview



Searching and Communicating

- You should already know that the internet is a network of networks.
- You should also know that the World Wide Web is the part of the internet where we can visit websites and webpages.
- The World Wide Web can be used to find information, using search engines.
- The internet is also a useful communication tool – with a number of different communication mediums for a range of different purposes.

Selecting and Ranking Search Results

Selecting Search Results

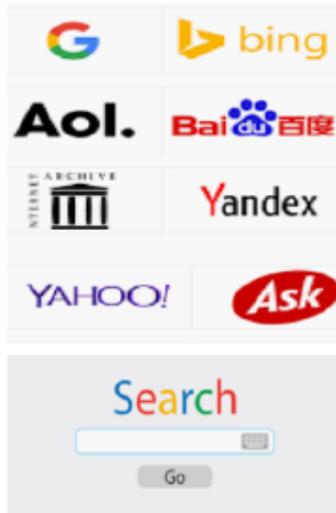
- Search engines use programs known as crawlers to index the World Wide Web.
- They 'crawl' websites for searchable information – they then store where it is found in a huge index.
- Search engines select information from this index when we type in key words.
- Searching for some search terms can bring many millions of results.
- We need to make sure that our search terms are as refined as possible, in order to allow the search engine to select the information that is most relevant.

Ranking Search Results

- Search engines 'rank' the web pages (the highest ranked page is at the top).
- Search engines use algorithms to do this – algorithms look at a number of different factors and give web pages a score for each.
- The web page with the highest score ranks the highest.
- Some factors include if the search term is in the title of the page (high points) or if it appears in the paragraphs of the text on the page (lower points).
- Web designers consider algorithms when making when pages.

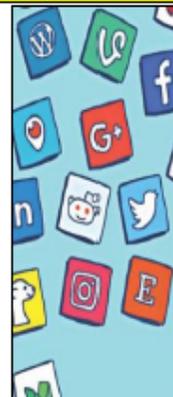
Search Engines - Introduction

- We can find information on the World Wide Web by using search engines.
- A search engine is a program that finds websites & webpages based on key words entered by the user.
- When the World Wide Web was invented by Tim Berners-Lee in 1989, there was only 1 website. By 2018, there were 1,630, 322, 579! The World Wide Web is a big place, and we need search engines to be able to find what we need.
- Some examples of search engines are Bing, Google, Yahoo, DuckDuckGo and Kiddle.
- You can also type searches into the address bar of the browser (e.g. Google Chrome or Microsoft Internet Explorer).



Online Communication

- Communication is when we share information with one another. We can communicate in lots of different ways on the internet, e.g. messaging services, emails, social media, video calling and gaming platforms.
- Public communication is visible to all, whilst private communication is restricted to only some people.
- Some communications are one-way (e.g. Youtube) whilst others are two-way (e.g. Skype).
- Some communications are to one person, whilst others are to many.
- We should consider which type of communication is most appropriate to our needs, safety and privacy.



Important Vocabulary

Internet World Wide Web Search Engine Browser Keyword Google Tim Berners-Lee Ranking Crawlers Algorithm