

National Curriculum objectives

- 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;
- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content;

Education for a Connected World links

- I am aware that a person's online activity, history or profile (their 'digital personality') will affect the type of information returned to them in a search or on a social media feed, and how this may be intended to influence their beliefs, actions and choices;
- I can explain how search engine rankings are returned and can explain how they can be influenced (e.g. commerce, sponsored results).

To begin this unit, the children should have already learnt:KS1

Computers are a part of Information Technology, 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.

Year 3

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.

Year 4

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 and children will have learned to check sources to verify its reliability.

The learning in this unit will prepare the children to learn these things in the future:Year 6

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.

Key Enquiry Question

What components does a computer system include? How does using search engines benefit our lives? What criteria might be used by search engines to rank results? How can people influence search results? Are there any limitations of search engines?

The Big Idea:

Systems are created by computers and other interconnected parts working together: Computer systems are made up of inputs (something that sends a message to the device), processes (the way the device acts on the message) and outputs (something that is sent out by the device). 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.

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

By the end of this unit, children will know:

- Systems are a set of interconnected parts working together;
- Computers can be connected together to form IT systems;
- Data can be transferred between IT systems;
- The role of IT systems in their lives;
- Search engines are examples of large IT systems;
- Why search engines create indices, and that they are different for each search engine;
- The role of web crawlers in creating an index;
- How search results are selected;
- That ranking orders search results to make them more useful;
- How ranking is determined by rules, and that different search engines use different rules
- Why the order of results is important;
- How search engines make money by selling targeted advertising space;
- Some of the limitations of search engines.

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.

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

- Recognise inputs, processes and outputs within IT systems;
- Describe the input and output of a search engine;
- Demonstrate that different search terms produce different results;
- Evaluate the results of different search terms.

Useful Resources:

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

COMPUTING SYSTEMS AND NETWORKS KNOWLEDGE ORGANISER

Overview



Systems

- You should also know that Information technology (I.T.) includes computers and things that work with computers.
- You should also know that computers have Input, Process and Output (IPO) components.
- Computer systems are built using a number of parts.
- Computer systems can communicate with other devices.
- There are many, many different kinds of computer systems all around the world, ranging from small-scale to large scale.

Systems

- Systems are a set of things working together as parts of a whole.
- Computer systems are made up of inputs (something that sends a message to the device), processes (the way the device acts on the message) and outputs (something that is sent out by the device). Below are some examples.

Washing Machine:

- Input: Dials and buttons.
 Process: The computer inside follows a program.
 Output: The clothes are washed and the display shows the remaining time.



DVD Player:

- Input: The disc is inserted and play is pressed on the remote.
 Process: The system reads the information on the disc
 Output: The screen displays the movie/ show.



Smart Locker:

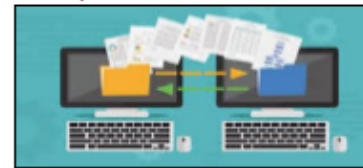
- Input: The customer scans in a barcode.
 Process: The code is recognised by the system.
 Output: The correct locker is opened.



Transferring Information

Protocols and Packets

- Protocols are an agreed way of doing something. When we communicate, we use an agreed set of protocols (greeting, speaking, listening, etc.).
- In computing, agreed protocols are the way that computers communicate with one another.
- The digital information they send is called a 'packet.'



IP Addresses

- Computers and their users are not always in the same place as one another.
- With billions of computers around the world, computers need to send the information to the correct place.
- To do this, computers use special addresses called IP addresses. They may look like this:

From: 216. 58. 1. 214

To: 216. 64. 1. 20

My IP Address
63.255.173.183



Working Together

- Collaborating is another word for working together on something, to reach a shared goal.
- The internet can be used to help people collaborate online, even when they are a long distance apart!
- 'Chat' functions can be used keep each other updated with new information.
- Shared 'cloud' spaces and online drives can allow one or more person to have access to/ edit documents.
- When building upon someone else's work, you need to be aware of copyright and intellectual property rules.



Important Vocabulary

System

Input

Process

Output

Protocol

IP Address

Packet

Reuse

Explore

Collaboration