

COMPUTING


KNOWLEDGE ORGANISERS

AUTUMN 1

COMPUTING SYSTEMS AND NETWORKS KNOWLEDGE ORGANISER

Overview

Technology Around Us




- Technology is something that has been made by people to help us.
- Technology is 'man-made' and not 'natural.' Examples include computers, phones, cars, bikes, and even pencils!
- Computers are a type of digital technology.
- Some of the different parts of a computer include the monitor, mouse and keyboard.
- There are a number of important rules to help us use computers safely.


Technology

- Technology is the name for man-made things that help us.
- Technology is all around us, and helps to make our lives easier.


Digital technology is the name for electronic items that create and store information, e.g. computers, mobile phones, and televisions.



Non-digital technology is the name for non-electronic items that do not create and store information.



Using Technology Safely




When using technology, we should:

- Hold the device carefully and use it gently.
- Not have food and drink around the device.
- Only use the programs that we are supposed to be using.
- Take turns with our partner, and stop using the device when we are being spoken to.

Computers


Screen/ Monitor



Keyboard Mouse


- Desktop computers need to be placed on a surface, e.g. a table or desk. Laptop computers are portable – they can be moved to different places.
- The screen (or monitor) displays what the computer is doing.
- The mouse lets you select and move objects (some computers have a trackpad instead).
- The keyboard lets you type letters and numbers.
- Computers can run different programs. Programs do different tasks on the computer. E.g. Microsoft Word, Microsoft PowerPoint and Paint.
- When we are using a program, we can save our work by pressing Ctrl + S or by clicking on this icon.

Using a Mouse



- The mouse can be used to click and drag.
- Clicking the left button lets us select something. Clicking twice quickly lets us open files and programs.
- Clicking the right button gives us options.
- Holding the left button down allows us to drag things.

Using a Keyboard




- Writing on a computer is called typing. We do this on a keyboard.
- Holding the shift key, or pressing caps lock, helps us to type a capital letter.
- Delete and backspace buttons can help us to remove typing.

Important Vocabulary

- Technology
- Man-made
- Digital
- Screen
- Mouse
- Keyboard
- Program
- Click/ Drag
- Cursor
- E-Safety

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Overview




Technology Around Us

- You should already know that Technology is something that has been made by people to help us.
- Technology is 'man-made' and not 'natural.'
- Information technology (I.T.) includes computers and things that work with computers.
- Information technology is in lots of important items in our homes and around the world.
- It is important that we understand how to use information technology safely.

I.T. in the Home

There is lots of information technology in our homes. I.T. is used to:


- Control the tools and appliances that we use in the home, e.g. the panel for the heating, setting the washing machine, and programming the microwave.
- Help us to communicate with one another, e.g. the internet router and the telephone.
- Entertain us, e.g. the information technology in toys, consoles and computer games.



I.T. in the World

There is also lots of information technology in the wider world

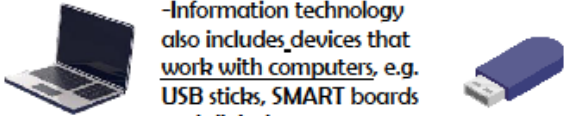
- I.T. can be found in shops, e.g. the barcode, barcode scanner and till all work together to scan your shopping items.
- I.T. can be found in ATMs, e.g. the bank card, chip and PIN card reader help you to access your bank account.
- I.T. can be found outside, e.g. traffic lights, buttons, and signals work together to tell you when to cross the road.



Information Technology

- Technology is the name for man-made things that help us.
- Information technology is made up of computers and things that work with computers.

-Information technology includes computers, for example desktop computers, laptops, games consoles, smart phones and tablet.




-Information technology also includes devices that work with computers, e.g. USB sticks, SMART boards and digital cameras.

Using Technology Safely



We can create and follow a number of rules to use technology safely, e.g.:

- Make sure that the games and apps that we access are age-appropriate.
- Always sit down when using devices. They can be broken if dropped!
- Do not use devices at social times, e.g. at the table. It is bad manners.
- Stick to using technology at agreed times. Too much screen time is not good for us!



How I.T. Improves Our World

- Information Technology helps us in lots of different ways in our daily lives.
- I.T. can help to make things quicker and easier. E.g. at the supermarket, the barcodes/ scanners quickly add up the product numbers and costs of the things that we want to buy.
- I.T. can also help us to stay safe. E.g. The traffic lights, buttons and signals help us to avoid traffic when crossing the road.
- I.T. also helps us to communicate with one another and have fun! E.g. it can connect us to the internet, and can allow us to play games, share and receive information.

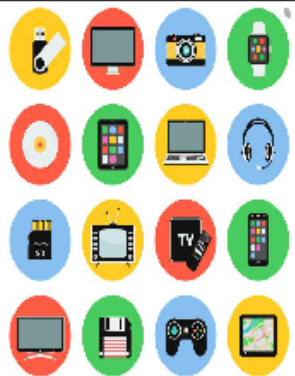
Important Vocabulary

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|------------------------|----------|--------|---------|---------|---------------|---------------|------------|--------|----------|
| Information Technology | Computer | Device | Barcode | Scanner | Communication | Entertainment | Appliances | Signal | E-Safety |
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COMPUTING SYSTEMS AND NETWORKS KNOWLEDGE ORGANISER

Overview

Digital Devices






- You should already know that Technology is something that has been made by people to help us.
- You should also know that Information technology (I.T.) includes computers and things that work with computers.
- Digital devices are things made for a particular purpose, that use processing.

Digital devices have an input, process, and output (IPO).

- Information and data can be shared across networks. Many devices are used to create networks.

Digital Devices – Input, Process Output (IPO)


- A device is something that has been made for a particular purpose (it has a special use).
- Digital devices use processing (have a process) There is more than just an on-off function. Digital devices have an input, process, output (IPO)

<p>Input: Something that sends a message to the device. E.g. You press a button on the keyboard.</p>  <p>Input Devices: Keyboard, joystick, mouse, web cam, microphone, touch screen, track ball, digital camera.</p>	<p>Process: The device acts on the message. E.g. The computer follows a program that tells it what to do when the keyboard is pressed.</p> 	<p>Output: Something that is sent out by the device. E.g. The letter that you have typed on the screen.</p>  <p>Output Devices: Screen/monitor, printer, headphones, projector, speaker, smartboard.</p>
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Networks and Network Devices

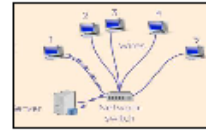
Connections and Networks

- In Computing, a connection describes a link between the computer and something else.
- For example, a computer may be connected to the internet through wires, a mobile data system, or WiFi.
- A computer network is a set of connections that joins computers together.
- The computers in the network can send and receive information to one another.




Network Devices

- Network switch: a device that helps different devices on a network to be connected with each other.
- Server: a computer that manages the network and stores files
- Wireless access point (WAP): a device, connected to a wired network, that sends and receives wireless signals to and from devices.



Why Networks Are Useful

- Computer networks allow us to send and receive information between computers that are in different places.
- Networks can help us to communicate quickly and easily.
- Networks can also join computers to shared devices, like scanners and printers.
- The internet is a global network of computers. Imagine how different life would be without the internet!
- If information is shared on a network, it helps to reduce the risk of data being lost, e.g. if one computer breaks.



Important Vocabulary

Digital Device	Input	Process	Output	Connection	Network	Network Switch	Server	WAP	E-Safety
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COMPUTING SYSTEMS AND NETWORKS KNOWLEDGE ORGANISER



Overview



The Internet

- You should also know that Information technology (I.T.) includes computers and things that work with computers.
- You should also know that information and data can be shared by devices across networks.
- The internet is a network of networks that is used around the world.
- The World Wide Web is a system on the internet that has websites and webpages.
- Some content is protected on the internet. It is important to know that not all information on the internet is accurate.


The World Wide Web

The World Wide Web

- The World Wide Web is the part of the internet where we can visit web pages and websites.
- Information can be shared in the form of things we can see or hear (e.g. things we can read, music, sounds, or videos, etc.).
- When we use the world wide web, routers help us to journey to different networks in different parts of the world.
- We can use traceroute tools to track the journey between routers.
- Web browsers, e.g. Google Chrome and Internet Explorer, let us look at different pages on the internet.

Website and Webpages

- Websites are a set of webpages.
 - Webpages may contain different features, e.g. a title, links to other pages, images, videos, and text.
 - Websites and webpages can be found using web addresses (domains), normally split into three parts:
1. www (world wide web).
 2. Name of the organisation/ topic.
 3. Type of organisation/ location.

 www.youtube.com

Networks and The Internet

- Networks connect different devices to one another, allowing for information sharing.
- Networks can also connect to other networks in different places, using a router.
- The internet is a network of networks that are all connected together.

Router: A router is something that finds a route between networks, connecting them.



The Internet: The internet is a network of networks, that is used around the world to share information and communicate.

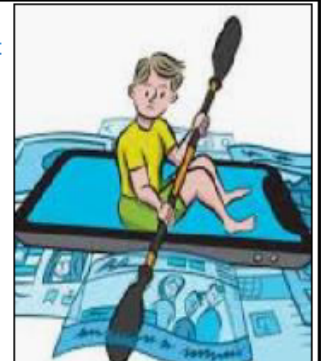


Protection: Networks have security features that mean they can block or allow messages and requests. This means that information and data can be kept safe.



Ownership and Reliability

- The content on the internet may belong to different people or companies, for example the person who wrote it or the company who published it.
- The content may be copyrighted, meaning that others cannot copy or use it without permission.
- Not all of the information that we see or hear on the internet is reliable. Some of it may be inaccurate due to people lying or misunderstanding things.
- Inaccurate information can quickly spread. This has become known as 'fake news.' We should check multiple sources that we can trust to verify information.



Important Vocabulary

Network

Internet

World Wide Web

Router

Security

Website

Webpage


Browser

Domain

Reliable

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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.

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



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.

<p>Washing Machine:</p> <p>Input: Dials and buttons.</p> <p>Process: The computer inside follows a program.</p> <p>Output: The clothes are washed and the display shows the remaining time.</p> 	<p>DVD Player:</p> <p>Input: The disc is inserted and play is pressed on the remote.</p> <p>Process: The system reads the information on the disc</p> <p>Output: The screen displays the movie/ show.</p> 	<p>Smart Locker:</p> <p>Input: The customer scans in a barcode.</p> <p>Process: The code is recognised by the system.</p> <p>Output: The correct locker is opened.</p> 
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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

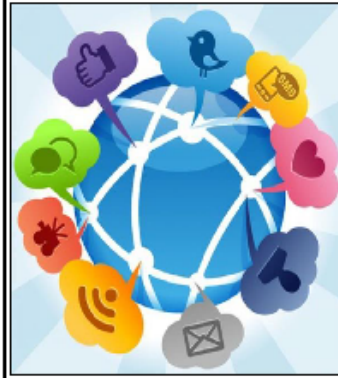
System	Input	Process	Output	Protocol	IP Address	Packet	Reuse	Explore	Collaboration
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Overview



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

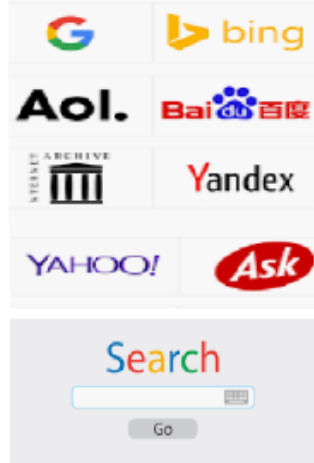
- Search engines use programs known as crawlers to index the World Wide Web.
- They 'crawl' websites for searchable information – they then store where it is found in a huge index.
- Search engines select information from this index when we type in key words.
- Searching for some search terms can bring 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.

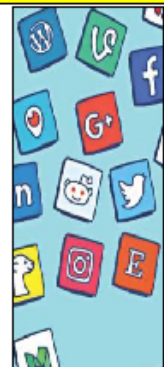
Search Engines - Introduction

- 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