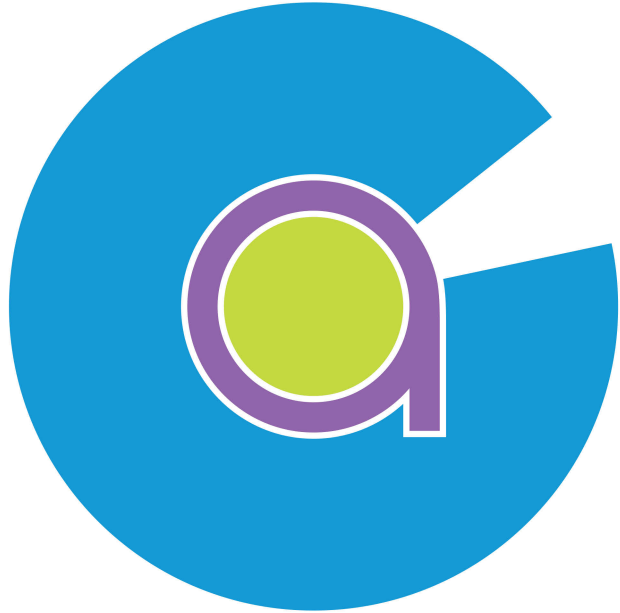


Computer Science



WELCOME BACK/TO
COUNTSTHORPE ACADEMY

Year 12

Mr Ford and Mrs Simpson

Today's Objectives

To gain a better understanding of Computer Science and prepare you for the term ahead.

To begin a taster task of the Computer Science course.

Introduce the summer task you are expected to complete

Course breakdown

▶ **Unit 01** –Computing Principles

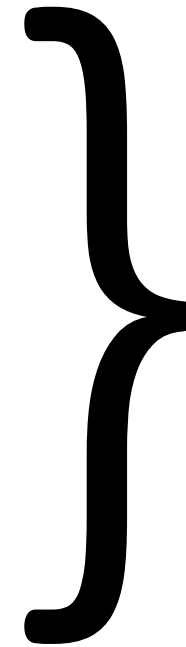
This is a **Exam** unit worth **40%**.

▶ **Unit 02** – Algorithms and Problem Solving

This is a **Exam** unit **40%** .

▶ **Unit 03** – Individual Project

This is a **Controlled Assessment** unit **20%** .



▶ **100%**

=A-Level

Lesson structure

9 Hours per fortnight

Always in IT room

Two teachers – Mr Ford and Mrs Simpson

Homework expected to be completed in none contact periods as well as at home. Important to complete to the best of your ability

Computer System

There are many hardware components within a computer system that form together to form one system

Examples include

- CPU
- RAM
- GPU

There are other components required which can be vital depending on what you are using the computer system for.

Academic Poster

Producing an Academic Poster can be a great way of presenting research in a concise and powerful manner. Most often they are used to present research findings at conferences and conventions.

The best Academic Posters are those which can effectively summarise the important aspects of a given research topic, are easy to read and understand, and are visually appealing. You want your poster to stand out and to leave the reader with more than a cursory knowledge of your research topic, the research methods you employed and your research findings.

Example

NETWORKS

A network is a connection of two or more computers that enables these computers to share resources and communicate with each other. There are two types of networks: Local Area Networks and Wide Area Networks.

LOCAL AREA NETWORK (LAN)

- A LAN enables the connection of two or more computers at a single site.
- Most LANs include a network server, a dedicated computer that runs the network software and stores shared files. Workstations are connected via wire cables, fibre optic cables or radio frequencies.
- LANs are often found in offices and schools - places where computers are located on one site.

WIDE AREA NETWORK (WAN)

- A WAN enables the connection of two or more computers in multiple locations.
- Users are able to access data when they are away from their main workplace.
- Users can connect via a WAN using telephone or ADSL lines, or via a virtual private network (VPN).
- Servers are required for WANs to operate. The Internet is an example of a WAN.

THE BASIC COMPONENTS OF A COMPUTER NETWORK

- Communication Media:** Different media, such as cables and wireless signals, that carry data between computers. They can be used to connect computers in a network, including wireless and fibre technology.
- Server:** There are powerful computers and storage devices on network sites that store data and control the network.
- User:** They are the people who use the network to perform tasks.
- Resource:** These are any resources that can be accessed by users on the network, including printers and file folders.
- Protocols:** A set of rules that define how devices on a network communicate. Two common protocols are TCP and IP.
- Network Adapter:** This is a circuit board that can send and receive data from the network. It is used to connect computers to the network. It is also known as the network interface card (NIC).
- Internet Protocol (IP):** It is a standard set of rules used to ensure that computers on the Internet send information to the correct address. Every computer on a network must have its own unique address known as an IP address.
- File Transfer Protocol (FTP):** FTP is used to transfer files between computers on the Internet.
- File Transfer Protocol (FTP):** FTP is used to copy files from one computer to another over a network and to download software, music, and files from the Internet.
- Classic:** These are protocols that define how devices on a network communicate. Two common protocols are TCP and IP.
- Mail Protocols:** Email has its own set of protocols for sending mail, and receiving mail. Simple Mail Transfer Protocol (SMTP) is used for sending mail and Post Office Protocol (POP) is used for receiving mail.
- Transmission Control Protocol:** TCP breaks information from into smaller pieces called packets that allow it to be transported. TCP then puts the pieces back together in the correct order on the receiving computer.

ADVANTAGES OF COMPUTER NETWORKS

- Expensive peripherals, such as printers, can be shared.
- Data can communicate quickly through the network.
- Data can be accessed by multiple users in different locations.
- Software can be installed onto the server and accessed simultaneously by users. Upgrading is also easier.

DISADVANTAGES OF COMPUTER NETWORKS

- The labour and equipment needed to set up and manage a network can be expensive.
- If there is a fault with the server, the whole network may stop working.
- The network can run slowly if many users are simultaneously trying to access the same program or file.
- Security measures may need to be in place to prevent unauthorized access of data.

What is Children's Literature?

By Hannah Dix, Laura Graill & Joseph Hoop

Pictures

Using pictures makes the reading experience more interesting for the child, especially as this is a book that is often read to parents, not by the child themselves. By looking at pictures, information is conveyed. "In a picture book, both the text and illustrations together would be designed to tell the story" (Giles 1996, p.10). In children's literature for younger age groups, the words are often used to describe the pictures, not the other way round. The illustrations are often used to help the child understand the story, not the other way round.

Education

The primary aim of children's literature is to educate. The educational content changes as the age of the child grows. For younger children, books teach basic information and are not overly moral and didactic. Though there are moral lessons to be learned, as children grow older and the stories they read change, so do the educational purposes that inform the book. Books can be used to teach children about science, history, and other subjects.

Language

Language also changes with the age of the child, so it is part of the learning process. With this book, the language is fun and the typography is large. However, Eric Carle did use interesting literary techniques to teach the children about colour words.

Language techniques in this book include: personification, metaphors, repetition, alliteration and onomatopoeia. By using these techniques, children are able to learn about language in a fun and engaging way. This book is a great example of how language techniques can be used to teach children about language.

Colour

Colour is a key part of young children's literature. While language is important to them, the pictures are what attract them to the book. Repetitive words like "red" and "blue" are used to help children learn about colour. The book is a great example of how language techniques can be used to teach children about colour.

Modes of address

Books are often written for different modes of address. Some are written for children, some for adults, and some for both. The book is written for children, but it is also a great example of how language techniques can be used to teach children about colour.

Interactivity

The book is a great example of how language techniques can be used to teach children about colour. It is a fun and engaging way to learn about language and colour.

Technology

The book is a great example of how language techniques can be used to teach children about colour. It is a fun and engaging way to learn about language and colour.

Written by Eric Carle


THE VERY HUNGRY CATERPILLAR

"one of the greatest childhood classics of all time" (Taylor 2004)

INTERNET USE


The Internet is a system of interconnected networks. To connect to the Internet, you will need:

Hardware




To connect to the Internet a modem is required. Internal modems are used in mobile devices to connect to the Internet via Wi-Fi, 3G and 4G technology.

Software



A web browser is required to retrieve and present information on the World Wide Web. Internet Service Providers provide connection software.

An Internet Service Provider



Internet Service Providers (ISPs) provide access to the Internet and additional services, such as e-mail and website hosting.

Internet Features

Communication

E-mail is used to send and receive digital messages over the Internet. Instant messaging is used for real-time messaging over the Internet, whilst VoIP enables video communication.

E-learning

The Internet can be used to access web-based learning systems and is a great source for revision and research. There are also numerous educational apps for use on smartphones and tablets.

E-commerce

Internet shopping has become hugely popular. Online stores are available 24 hours a day and enable consumers to shop from home.

File Storage and Transfer

Users can download and upload files, such as music, to and from the Internet. Many businesses also offer a secure online data storage service.

Social Networking

Social networking websites are a great way of keeping in touch with friends and family, and meeting new people. Discussion boards, instant messaging and forums are common features.

Gaming


The Internet can be used to access single and multi-user computer games. Players from all around the world can participate and compete in the same game.

News and Entertainment

The Internet is updated constantly, providing instant access to breaking news, entertainment and sports results.

Online Audio and Video

Users can buy and download music, podcasts and videos online. File-sharing websites, such as YouTube, enable users to share audio and video, whilst many television broadcasters stream programmes online.



Task

Create an academic poster based on hardware and technical aspects required to build a computer

Start with the CPU in the centre

- Discuss what it is, CU, ALU, Registers

Go around like a spiral of the hardware and key components (next would be a motherboard)

- Include Buses, Northbridge, Southbridge, cache memory etc.

Include pictures and make sure the information is brief and to the point

Add the other components (you may need to research the different components. Do not rely on copy and paste as this will not help you to gain the qualification.

Summer Task



USING THE DOCUMENT CODE CHALLENGES,
COMPLETE THE PROGRAMMING TASKS. AIM
TO COMPLETE ALL OF THEM BEFORE THE START
OF THE NEW SCHOOL YEAR.

USE IDLE SOFTWARE (SEE NEXT SLIDE)
FOR HELP (SEE SLIDE 11)

IDLE

You are not expected to pay for any specialist software as there are many open source or free programs available for you to complete the course. You are expected to download and install IDLE which is a free program to use during the course and it will also enable you to complete some of the tasks you are expected to complete. The software is available at:

<https://www.python.org/downloads/>

Python Help

Use the following websites to help you if you are struggling to use IDLE or Email your tutors.

<https://realpython.com/python-idle/>

https://www.pitt.edu/~naraehan/python3/getting_started_win_first_try.html

<https://www.dummies.com/programming/python/how-to-start-idle-in-python/>

<https://www.tutorialspoint.com/python/index.htm>

Support

For general Sixth form enquires, Email
6thform@clcc.college

For Computer Science enquires, Email
nford@clcc.college
ksimpson@clcc.college



CODE CHALLENGES

Complete these tasks in your chosen programming language (C#, Java, Python...). Use Tutorials Point to help you learn your language

<https://www.tutorialspoint.com/python/index.htm>

1. Write a program which tells a joke – don't forget timing for the punch line!
2. Write a program which simulates a piggy-bank. Ask for how many coins.
3. Write a program which prints out the times tables up to 12 of any number up to 99 when the user enters the number (1-99)
4. Write a program which tests people's reactions. The game must allow the user to hit the enter key, guess how long 10 seconds is and hit enter again. Your program must tell them how close to 10 seconds they were
5. **Challenge:** add grades to program 7. For example, within 0.5 seconds is an A, 1 second is a B etc...
6. Write a program which counts the number of words in a sentence.
7. Write a program which will allow the user to add names to an array structure until they enter "exit". Then the program should tell them if any names are duplicated.