

A Level Computer Science

OCR H446



What is A Level Computer Science?

- ▶ Computer Science at A Level moves you up a level from GCSE. It is all about:
- ▶ Developing an understanding of how computers hardware works.
- ▶ Learning about types of Software and their uses.
- ▶ Developing your computational thinking skills and problem solving.
- ▶ Taking your skills in creating Algorithms to the next level.
- ▶ Moving your programming skills forward through your choice of Project.



Why you should study Computer Science?

- ▶ It is a highly regarded subject accepted at all universities and colleges.
- ▶ The problem solving and thinking skills that you learn will support your other subjects and your future self!
- ▶ It is a good mix of practical and theory.
- ▶ Offers you access to a range of degrees and Apprenticeships.

Computer science is fundamental for every student's success

Six different studies show: children who study computer science...

perform better in
other subjects



excel at
problem-solving



are 17% more likely
to attend college



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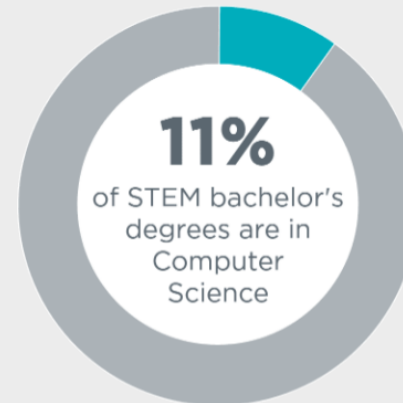
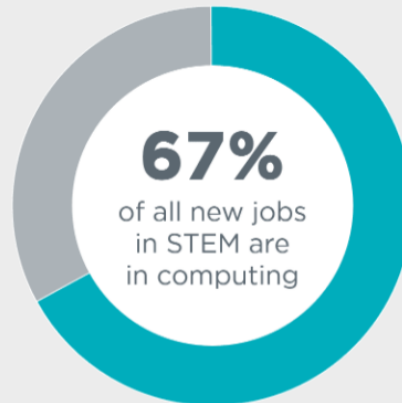
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The "STEM" problem is in computer science



Code.org

Assessment

- ▶ Unit 1 Computer Systems worth 40%. Examined unit. This covers the theory behind computer systems.
- ▶ Unit 2 Algorithms and Programming worth 40%. Examined unit. This unit tests your ability to solve problems and develop algorithms to demonstrate potential solutions.
- ▶ Unit 3 Programming Project worth 20%. This is a coursework unit where you choose a project and design, build and evaluate a solution for your chosen scenario.



Unit 1 Computer Systems

- ▶ **Hardware** (CPU, Input, Output, and Storage Devices)
- ▶ **Software** (Systems Software, Application Generation, Software Development and Types of Programming Languages)
- ▶ **Exchanging Data** (Networks, Compression, Encryption, Databases, Web Technologies)
- ▶ **Data** (Data types, Data Structures, and Boolean Algebra)
- ▶ **Legal, Moral and Ethical Issues** (computer related laws, wider ethical issues of computer usage)



Unit 2 Algorithms & Programming

- ▶ Computational Thinking (Ahead, Logically, Abstractly, Procedurally, Concurrently)
- ▶ Problem Solving and Programming (Programming techniques, Computational Methods)
- ▶ Algorithms (Big O Notation, Trees, Queues, Linked Lists and how to read and write complex algorithms)



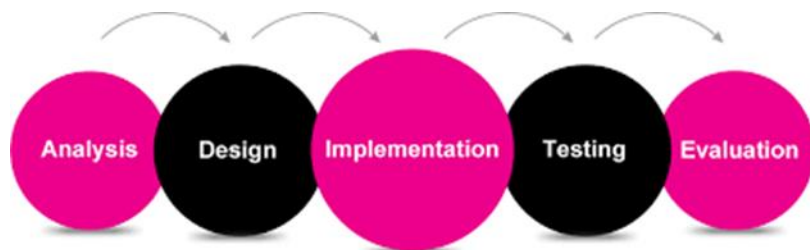
Bubble Sort
Larger elements shift to the end

Un-Sorted sub array Sorted sub array

```
void bubbleSort(int a[])
{
    for(int i=0; i<5;i++)
    {
        for(int j=0; j<(5-i-1); j++)
        {
            if(a[j]>a[j+1])
            {
                int temp = a[j];
                a[j] = a[j+1];
                a[j+1] = temp;
            }
        }
    }
}
```

Unit 3 Programming Project

- ▶ Analysis (research skills)
- ▶ Design (uses Decomposition and Algorithm skills)
- ▶ Develop (uses Programming Skills and Iterative testing)
- ▶ Evaluation



Past Projects Include

- ▶ Stock Inventory systems
- ▶ Recipe Application
- ▶ 2D games
- ▶ Subject Quizzes
- ▶ Booking Systems
- ▶ Baby Monitoring system
- ▶ Book referral system



Where Can Computer Science take you?

- ▶ Past students have gone on to:
 - University degrees in: Computer Science, Networking, Cyber Security, Game Design,
- ▶ Apprenticeships at :
 - PWC
 - CapGemini
 - Local Software Development companies
 - Rolls Royce
 - Land Rover Jaguar



Any Questions?

- ▶ Please don't be afraid to ask!
- ▶ Course contact:
- ▶ Mrs A Jones (Head of Computing) ajones@stfrancis.cc
- ▶ Mr A Dawson (Assisant Head of 6th Form, Teacher of Computing) adawson@stfrancis.cc

