

# **A-level Computer Science at The Blue Coat Sixth Form**



## **Bridging Unit: 2**

### **Consequences of Using Computers**

This is the Bridging course aimed to get you ready for your A level Computer Studies course.

As well as the programming aspect of the course there are the theory topics related to computing too.

As computers become more prevalent and dominant in today's society the consequences of using computers can cause as many issues as they aim to solve.

During the course we will look at individual (moral) issues, social (ethical) issues, legal issues and cultural issues. This is a very wide-ranging topic and opinions can differ wildly.

This section of the bridging unit will give you the opportunity to explore some of these areas in detail.

*Instructions: read the text below following the hyperlinks to further information where necessary. This will give you a general oversight of issues surrounding computers.*

*At the end there are two essay style questions for you to consider relating to the topic.*

## **Consequences of uses of computing**

A myriad of examples and case studies exist which address the moral, ethical, legal, and cultural impacts of technology on individuals and societies.

Of course, the nature of information technology and computer science means new cases are arising constantly.

The examples below are a highlight of some of the more significant cases from the last few years, along with examples of sites that provide up to date examples.

## **Ethical issues related to surveillance**

NSA Internet surveillance

In June 2013, the Guardian and Washington Post newspapers published revelations about a secret, quasi-legal US government Internet surveillance programme known as PRISM and operated by the National Security Agency (NSA). In the following weeks global media continued publishing revelations of ever more extraordinary surveillance systems. First, revelations that the NSA had worked with the British intelligence agency GCHQ to side-step legal issues, then evidence that online images were being collected and mined, and finally, confirmation that thousands of mobile phones had been monitored and tracked. Foreign allies were quickly alienated as it was revealed that the NSA had spied on supposedly friendly governments and ministers, including the Germans, Chileans, and Brazilians. The articles below highlight some of the key events in the scandal and make excellent material for classroom discussion of the ethics of surveillance.

- [The NSA and surveillance ... made simple - video animation](#)
- [NSA Prism program taps in to user data of Apple, Google and others](#)
- [GCHQ taps fibre-optic cables for secret access to world's communications](#)
- [NSA 'tracking' hundreds of millions of mobile phones](#)
- [New NSA leaks show how US is bugging its European allies](#)
- [US allies Mexico, Chile and Brazil seek spying answers](#)
- [NSA monitored calls of 35 world leaders](#)
- [NSA collects millions of text messages daily in 'untargeted' global sweep](#)
- [N.S.A. Collecting Millions of Faces From Web Images \(NY Times\)](#)
- [What the NSA can \(and can't\) mine from intercepted photos](#)
- [NSA: Nude Snaps Agency - Swapping other people's sexts is a fringe benefit](#)

## **Ethical issues related to software development**

The following ethical case studies involving software developers make excellent material for assignments or classroom discussions and debates:

The [Occidental Engineering Case Study](#) from Santa Clara University. This case study focuses on a software engineer pressured by management to certify a safety critical system he knows is not finished.

[Therac-25](#) is a classic computer science case study. Between 1985 and 1987, software errors in the Therac-25 radiation therapy machine caused death or severe injury to six patients.

Involving mistakes throughout the development and support processes, the case highlights the need for professional standards when dealing with safety critical systems.

## **Ethical and legal issues related to databases**

Examples of database security problems

The news articles below cover some of the major risks of malicious actions such as hacking or malware. Myriad examples of these problems exist (and new ones seem to appear every few weeks), but the examples below highlight some of the more famous cases (and the greatest losses).

- [Target Expects \\$148 Million Loss from Data Breach](#)
- [Security lapses at Apple and Amazon lead to an epic hack](#)
- [McDonald's customers' data exposed in a Big Mac hack attack](#)
- [Sony fined over 'preventable' PlayStation data hack](#)
- [Lost in the post - 25 million at risk after data discs go missing](#)
- [Zurich Insurance fined £2.3m over customers' data loss](#)
- [Doorstep lender Shopcheck fined £150,000 for data loss](#)
- [Home Depot: Card breach put 56M cards at risk](#)

## **Link to Videos**

<https://online.clickview.co.uk/exchange/channels/9510679/computer-science-with-craig-n-dave/playlists/9544964>

## Question One

Google have a service called Street View which allows a user to view surroundings from street-level. Google have extended their Street View service to cover the inside of buildings such as museums and sports stadiums.

Discuss a range of ethical, legal and cultural issues that Google may have needed to deal with when extending the service.

(Total 9 marks)

## Question Two

Between 2008 and 2010, a company that was gathering data for an online mapping system, using cars fitted with cameras and WiFi equipment, collected some information that was being transmitted on personal WiFi networks. The company apologised for doing this and an investigation found that a small number of software developers had been responsible for adding this functionality to the mapping system data collection software.

In the context of this example, discuss:

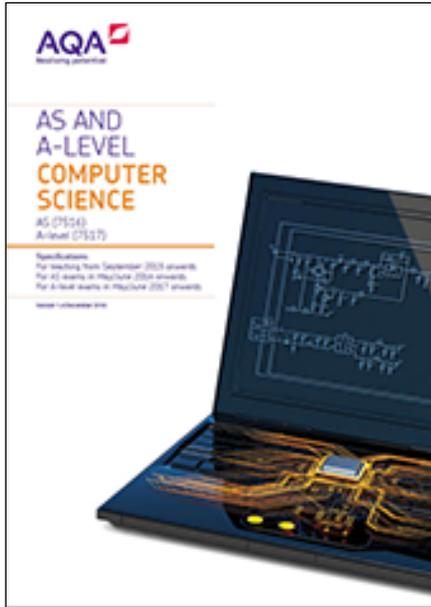
- how it was possible for this data to be collected.
- what steps the owners of the networks could have taken to prevent the data from being collected.
- what legal and ethical issues might have arisen as a result of collecting this data.
- what lessons the company might have learnt from the incident and how their practices might have changed as a result of it.

In your answer you will be assessed on your ability to follow a line of reasoning to produce a coherent, relevant and structured response.

(Total 12 marks)

**Answer the questions in word processed document and save. You will need to refer to this for the next section of the bridging unit.**

## Useful information to know



### What specification is it?

#### A-level Computer Science 7517

<https://www.aqa.org.uk/subjects/computer-science-and-it/as-and-a-level/computer-science-7516-7517>

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