



## Emerging computer technology

Expected time to complete: 2 hours

In this task you get to investigate any area of emerging computer technology which interests you.

You can pick any area which interests you, but examples could be:

- Artificial intelligence
- Robotics
- Automated self driving cars
- Quantum computing

In no more than ONE side of A4 summarise the area you have chosen under the following four headings:

1. What is it?
2. What are the possible Social, Moral, Cultural and Ethical **benefits** of this technology on society
3. What are the possible Social, Moral, Cultural and Ethical **risks** of this technology on society
4. My conclusion on this technology and what it will mean for our world 10 years from now

### Additional help:

For additional help and support in structuring your answer you might like to watch some of the videos from the following Craig 'n' Dave playlists:

OCR:

SLR 17 – Ethical, morale and cultural issues

<https://student.craigndave.org/videos/slr-17-ethical-moral-and-cultural-issues>

AQA:

SLR 19: Moral, social, legal, cultural issues

<https://student.craigndave.org/videos/slr19-moral-social-legal-cultural-issues>



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## Thinking like a computer

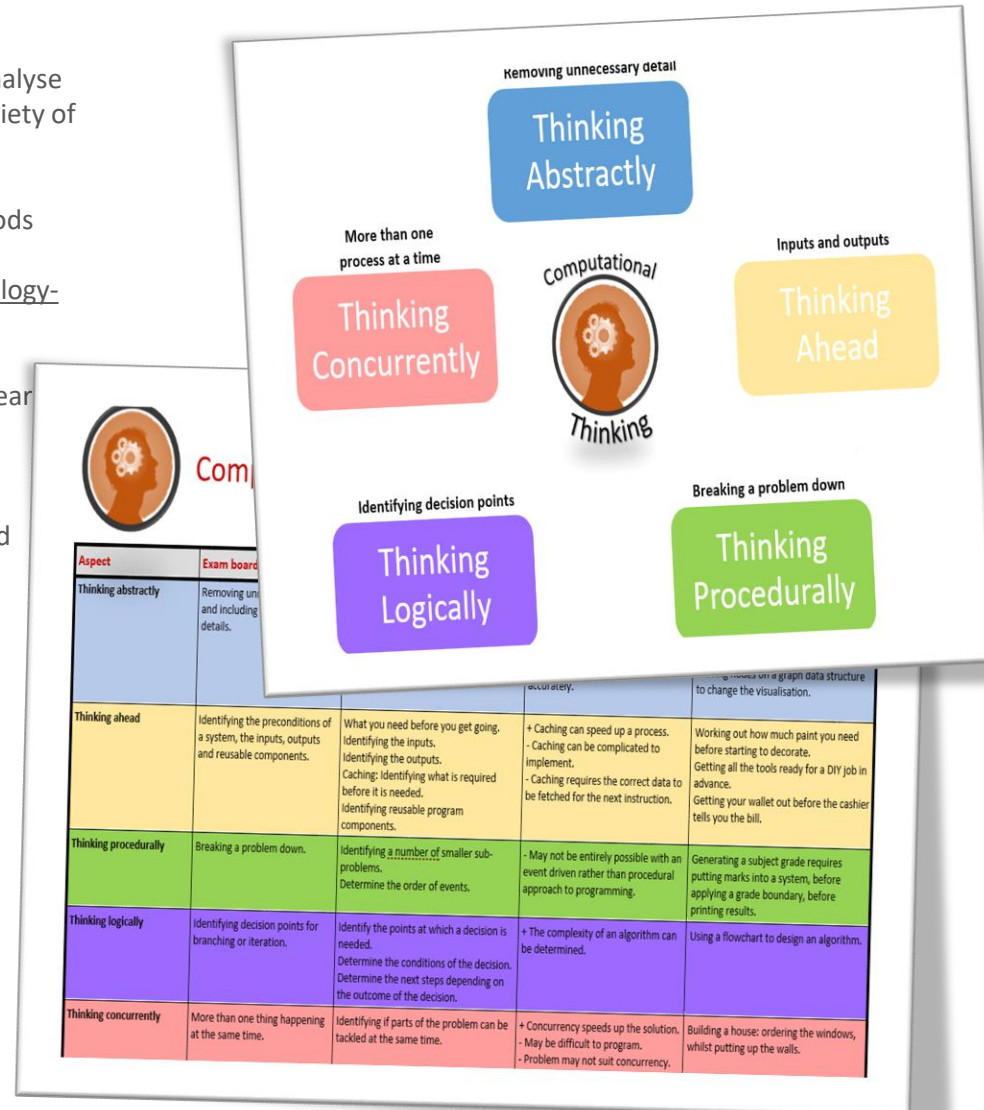
At the heart of Computer Science is the ability to look at problems, analyse them, break them down and solve them in a way which involves a variety of “Computational Thinking” skills.

- Download the “Computational thinking and Computational methods placemats” from Craig n Dave:
  - <https://student.craigndave.org/specification-key-terminology-and-cheat-sheets>
- Create your own spider diagram / mind map which shows your clear understanding of the 5 different computational thinking strands
  - Keep it to a single side of A4 / A3
- Your goal is to imagine someone else has to revise from your mind map. Ask yourself:

**Note:** • Does it make sense?

• Is it clear?  
 Although the five strands listed (and the download resources provided for this task) are from the OCR AS / A'Level specification, the concepts of “Computational Thinking” are just as applicable to the AQA course.

Indeed many of the strands listed are explicitly covered in the AQA specification in different locations.





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## Getting to grips with terminology

An important aspect of being successful with your study of Computer Science is getting to grips with subject related terminology. There are over 240 specific terms you will need to learn!

Below are a handful of the key terms you will need to become familiar with.

Control Unit

Register

Busses

Von Neuman Architecture  
Operating System

Optical Storage

Intermediate Code  
Compiler

Device Driver

Assembly Language  
Compression

Machine Code

Hashing  
Stack

Normalisation

Packet Switching  
Decomposition

ASCII

Lossy

TCP/IP

Problem



1. Research each of the key terms and write a definition.
2. Resist the urge to simply cut and paste a definition from the first website you find.  
Many definitions found on The Internet are overly complicated and wordy.



Expected time to complete: 6 hours

## Programming basics

Learning to “code” is a fun and essential part of A Level Computer Science. This task is ideal if you haven't done the GCSE in Computer Science or you simply want a nice refresher ahead of starting your A Level course.

1. Head over to the web site: <https://www.learnpython.org/>
2. Complete the following python tutorials under the heading:
  - Hello, World!
  - Variables and Types
  - Lists
  - Basic Operators
  - String Formatting
  - Basic String Operations
  - Conditions
  - Loops
  - Functions
3. Each section presents you with theory, code to run and exercises to try out.
4. If you want to practice writing your own python programs you can download and install a simple python development tool here: <https://www.python.org/downloads/>

### Additional note:

This task is most suited to students who intend to do the A Level and have not previously gained much / or any programming experience from the GCSE Computer Science course.

Although the language chosen here is Python, and that may not be what you will be using at A Level, it is the underlying programming concepts which are important.

The list of topics above cover the standard set of programming concepts you would be expected to know having completed a GCSE and Computer Science and so will prepare you well for the A level.





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## Why is Computer Science important?

It is easy to say, “Computer Science is essential in today’s world”, but are you able to think critically about this statement and back it up? “Thinking Critically” is an essential skill at A Level.

It involves you:

- Looking at a topic / concept in depth
- Taking account of different views / perspectives
- Considering positives and negatives
- Evaluating links and effects on other concepts
- Drawing your own conclusions backed up with evidence

1. On the following slide answer the questions:

- What is Computer Science?
- What are the benefits and risks of Computer Science at a local level (think about your local community / town / city / county)
- What are the benefits and risks of Computer Science at a national level
- What are the benefits and risks of Computer Science at a global level

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