Highsted Knowledge Organiser

Computer Science: Algorithms – Year 9

What I need to know

- What does the term algorithm means
- How to represent algorithms (flowchart and pseudocode)
- Create algorithms using flowchart diagram
- Describe binary and linear search algorithms
- Describe bubble and insertion sort algorithms
- Demonstrate how each of the search and sort algorithms work

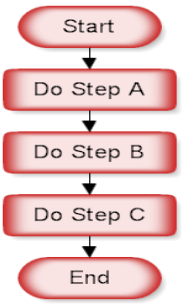
Key Vocabulary

- Algorithms	- Binary search
- Flowchart	- Linear search
- Pseudocode	- Insertion sort
- Sequence	- Bubble sort
- Selection	- Middle value
- Comparison	- Pass

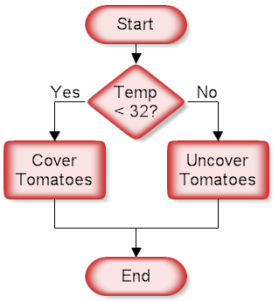
Student reference point

Symbol	Name	Function
	Start/end	An oval represents a start or end point.
	Arrows	A line is a connector that shows relationships between the representative shapes.
	Input/Output	A parallelogram represents input or ouptut.
	Process	A rectangle represents a process.
	Decision	A diamond indicates a decision.

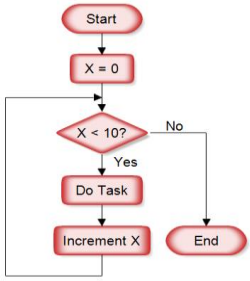
Sequence



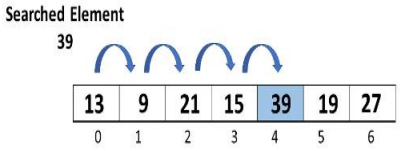
Selection



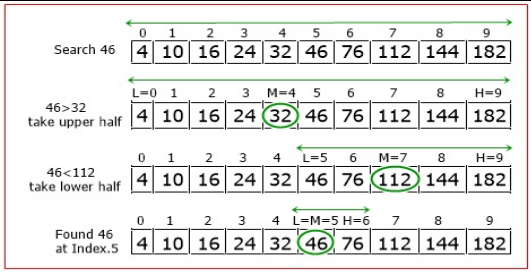
Iteration



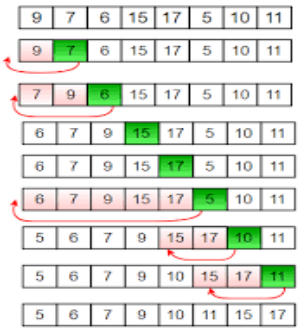
Linear Search



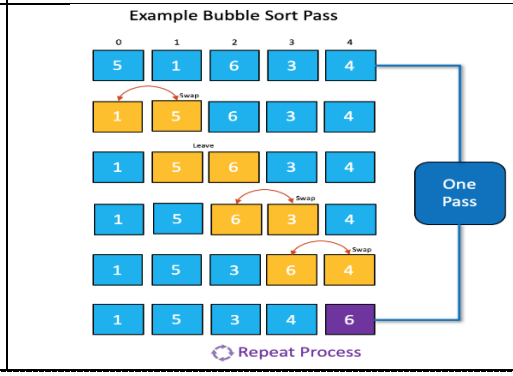
Binary Search



Insertion Sort



Bubble Sort



Challenge question

- What are the advantages of using binary search algorithm?
- What are the disadvantages of using bubble sort algorithm?
- How the insertion sort algorithm work?
- Create a flowchart to find the sum of 5 numbers.

Suggested reading

- https://www.bbc.co.uk/bitesize/guides/zpp49j6/revision/3
- https://www.bbc.co.uk/bitesize/guides/z7kkw6f/revision/6

Highsted Knowledge Organiser

Computer Science: Ethical, Legal, Cultural and Environmental Impacts of Technology – Year 9

What I need to know

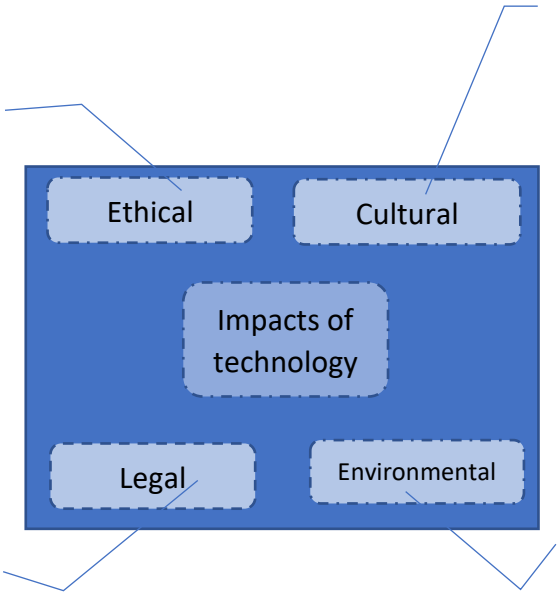
- Consider and investigate issues surrounding computer science technology by looking at these categories: -
  - Ethical issues
  - Legal issues
  - Environmental issues
  - Privacy issues
- Consider legislation relevant to computer science: -
  - The data protection act 1998
  - Computer misuse act 1990
  - Copyright, designs and patents act 1988

Key Vocabulary

- Ethics	- Legal
- Cultural	- Environmental
- Data protection act 1998	- Computer misuse act 1990
- Copyright act 1988	- Privacy

Student reference point

- Ensuring public safety
- Cyberbullying
- Access to inappropriate content
- Increased piracy
- Trolling
- Who is at fault in regards to AI or robots or driverless cars?
- What about your privacy?



- Impacts of technology on everyday life
- Digital divide
- Globalisation
- Easy and faster communication
- Rapid spread of technology

- The data protection act
- Computer misuse act
- Copyright act
- Plagiarism
- Piracy
- Fair use

- Fossil fuels in manufacturing
- Energy consumption
- Disposal of old equipment
- Wildlife and weather tracking

Computer Misuse Act 1990

- It is an offence to:
  - Access computer materials without permission
  - Access a computer with intent to commit further cyber offences
  - Access computer material with intent to modify it

The 8 principles of the Data Protection Act 1998

- Fair, lawful and transparent processing
- Purpose limitation
- Data minimisation
- Accuracy
- Data retention
- Data security
- Accountability

Copyright, Designs and Patent Act 1990

- Protects the creators of original pieces of work
- Can't be used without their permission
- It is illegal to copy and distribute the work
- Work include; books,

Challenge question

- How can the use of technology cause health problems?
- What is meant by digital divide?
- What are the ethical issues with the introduction of driverless cars?
- What is internet censorship?

Suggested reading

- https://www.bbc.co.uk/bitesize/guides/zbgg4qt/revision/1
- https://www.bbc.co.uk/bitesize/guides/zhx26yc/revision/2