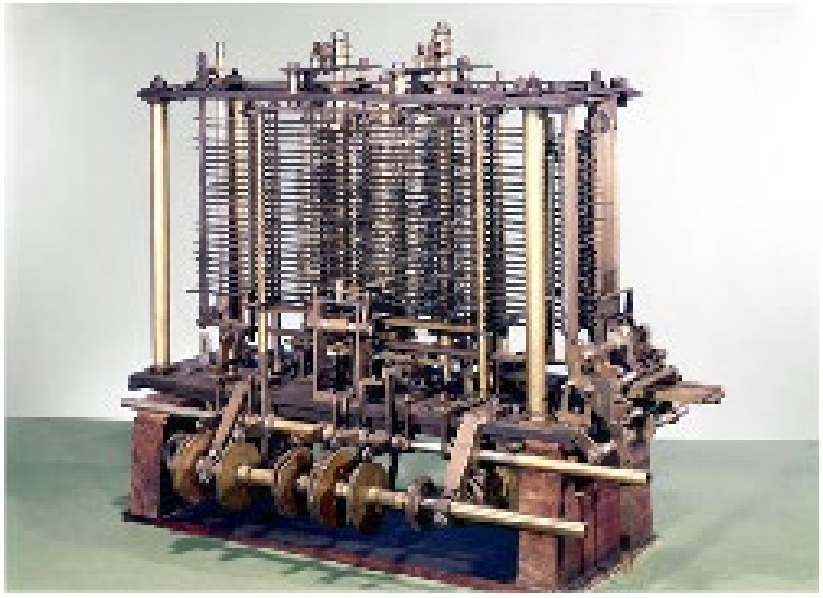
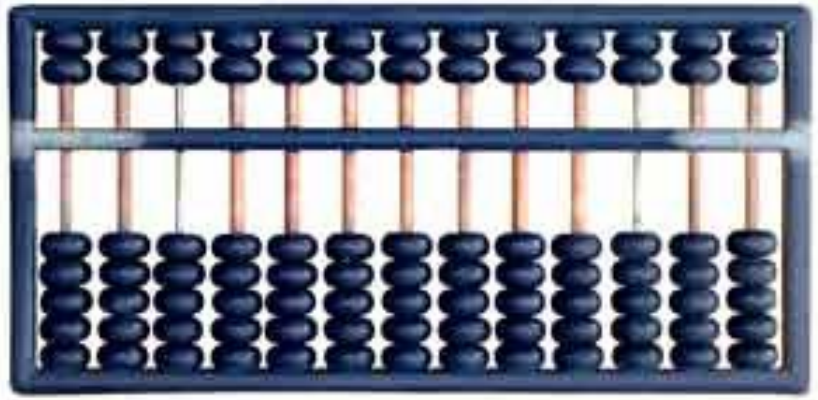
History of Computers

Year 6/7 Computer Science Summer homework

Starter

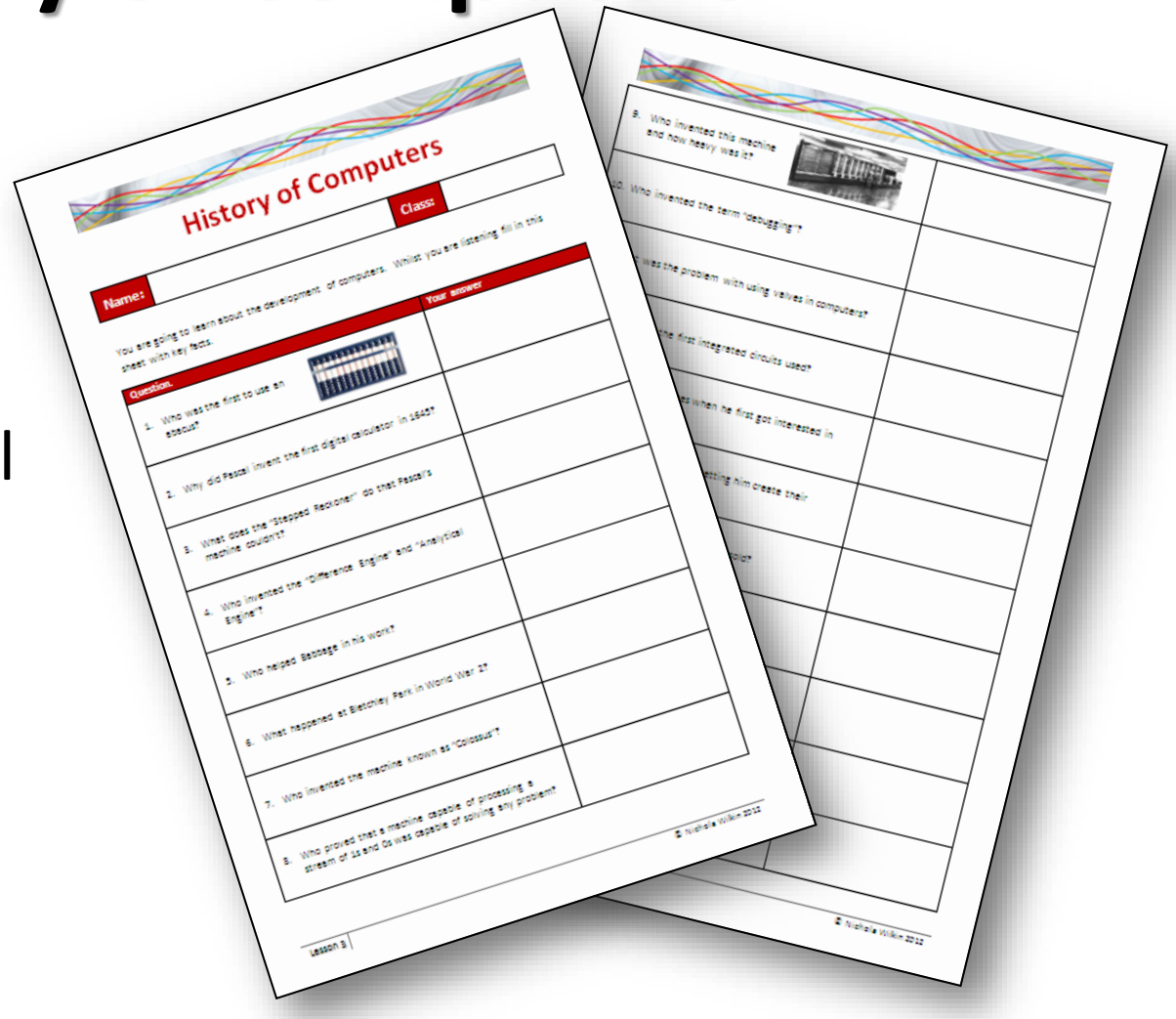
What do these two things have in common?





History of Computers

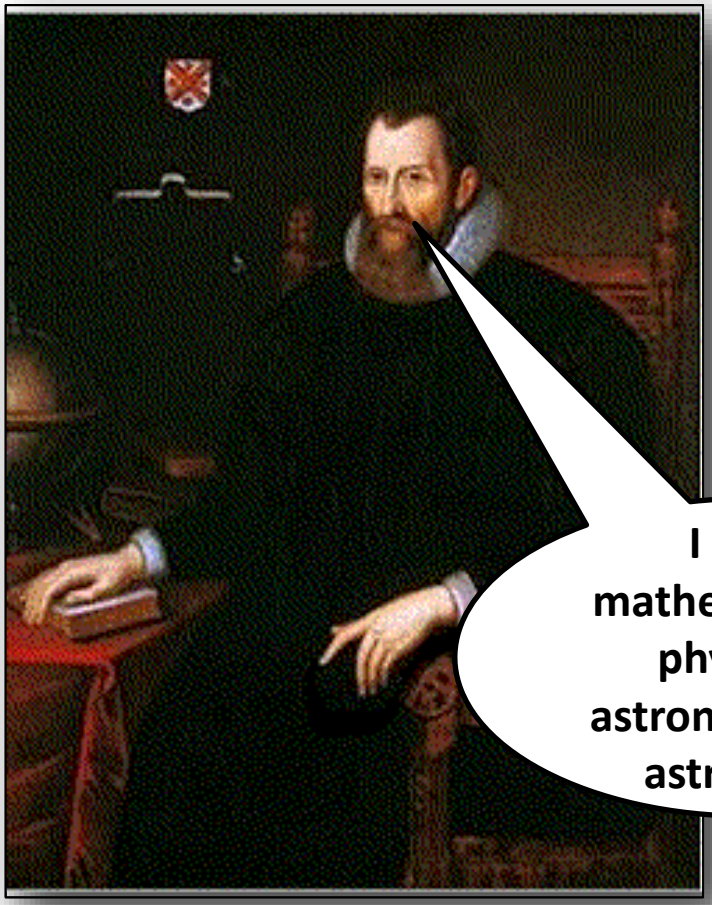
You are going to learn about the history of computers. While you are listening, fill in the task 1 to answer questions about the key points in the history.



Over 5000 years ago…

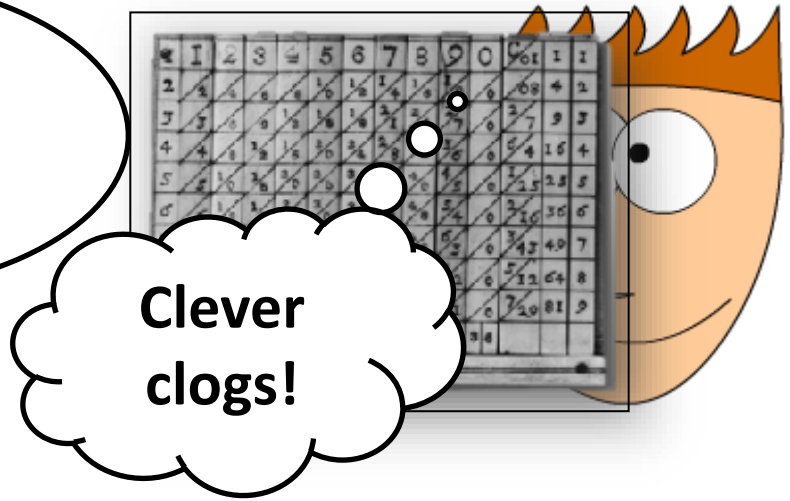
The abacus was used in Babylon 2000 years before the Greeks used it to help with calculating. To use it, you slide the beads up and down on the rods to add and subtract. It is still used today in some countries.

John Napier



John Napier invented "logarithms" which use lookup tables to find the solution to otherwise tedious and error-prone mathematical calculations.

I am a mathematician, physicist, astronomer and astrologer.



Clever clogs!

Blaise Pascal

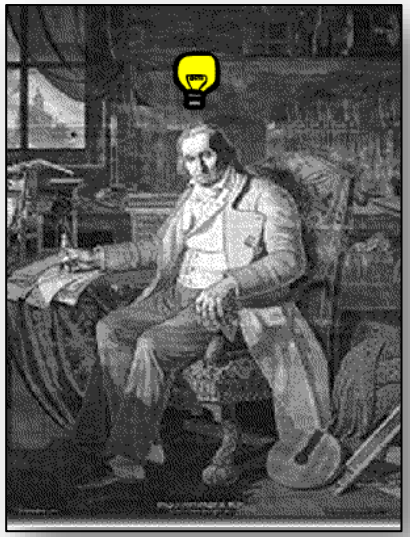
This famous French philosopher and mathematician invented the first calculator in 1645 to help with collecting taxes. It could add and subtract by rotating dials.

Gottfried Wilhelm von Leibnitz

Leibnitz invented a machine in 1674, around 30 years after Pascal invented his machine. He called it the “Stepped Reckoner” and it could not only add and subtract, but multiply and divide as well.

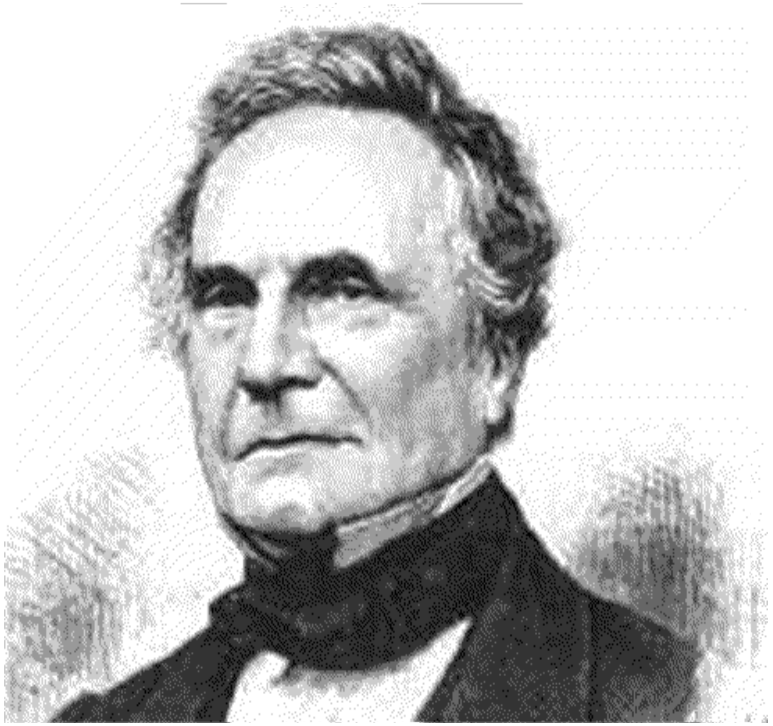
Joseph-Marie Jacquard

Joseph-Marie Jacquard was a weaver. In 1804, he got the bright idea of adapting the use of punched cards used in musical boxes to control his looms. His invention provided a model for the input and output of data in the electro-mechanical and electronic computing industry.



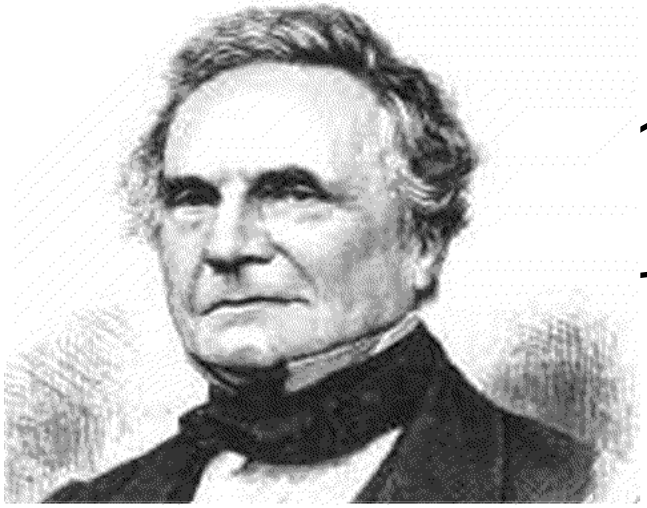
Charles Babbage

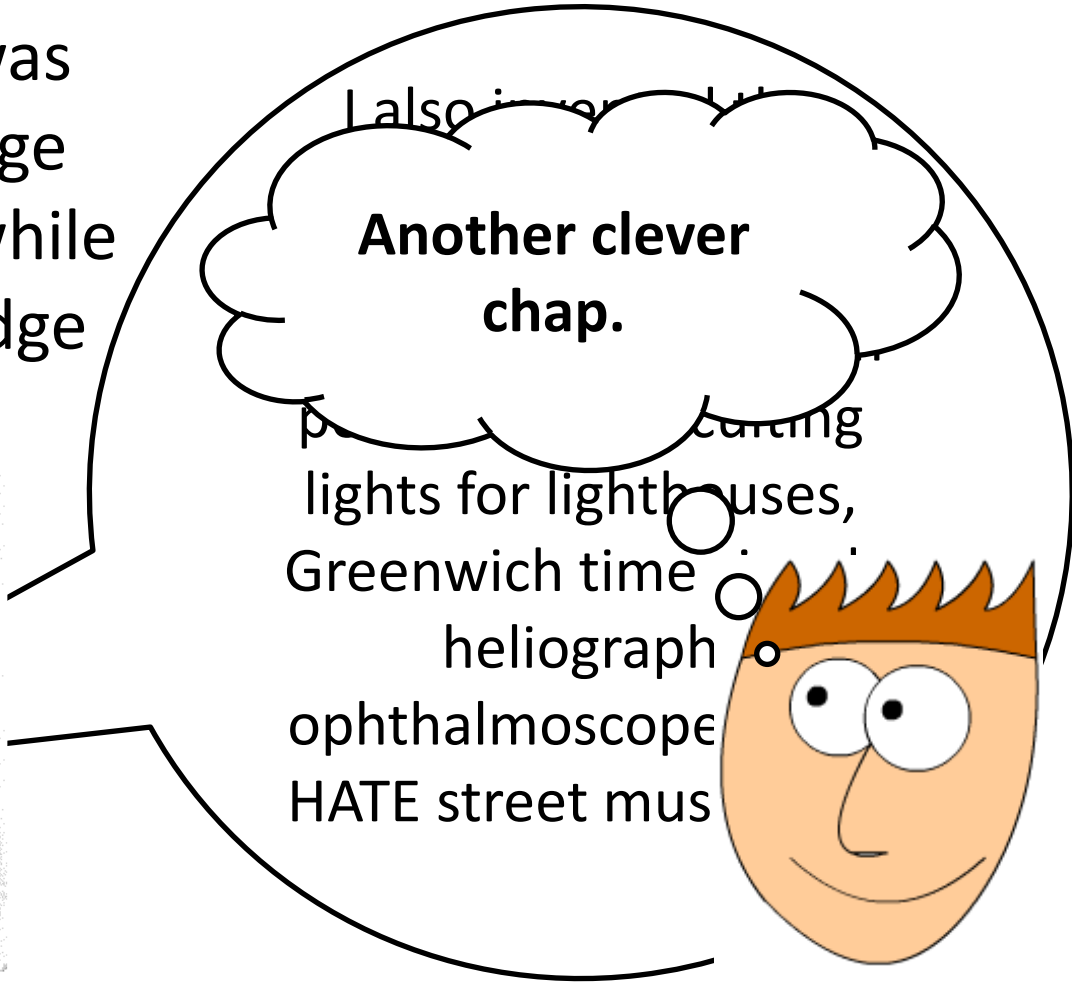
Charles Babbage designed the "Difference Engine" and "Analytical Engine" in the early 19th Century, which was the blueprint used in the invention of the modern electronic digital computer.



Charles Babbage

The Difference Engine was never fully built. Babbage drew up the plans for it while still a student at Cambridge University.





Lady Augusta Ada

She was the daughter of the famous romantic poet Lord Byron and she was a brilliant mathematician who helped Babbage in his work. She documented his work, which Babbage could never bother to do and also wrote programs to be run on Babbage's machines. She is recognised as the first computer programmer.

Bletchley Park

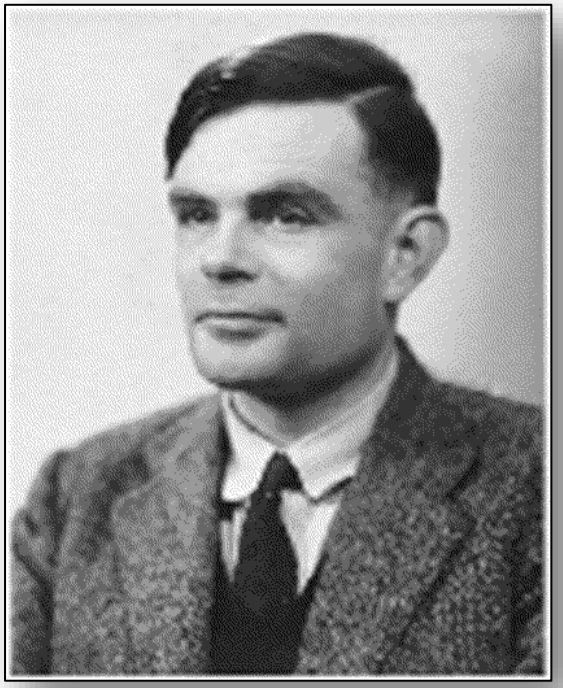
During World War 2, code breakers used computational analytical models to try and work out what enemy messages meant.

Bletchley Park

Two young engineers who met there were called...

Tommy Flowers

and

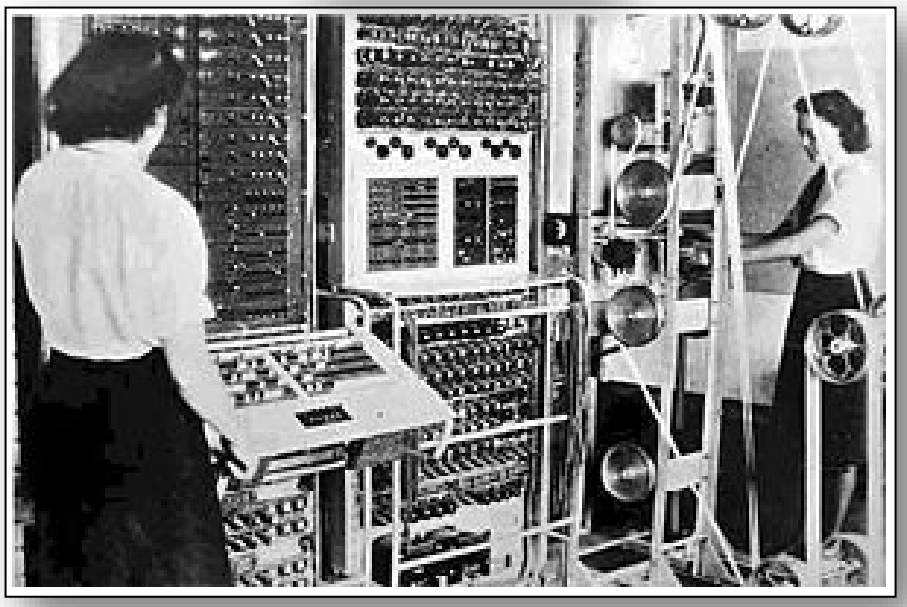


Alan Turing

Tommy Flowers

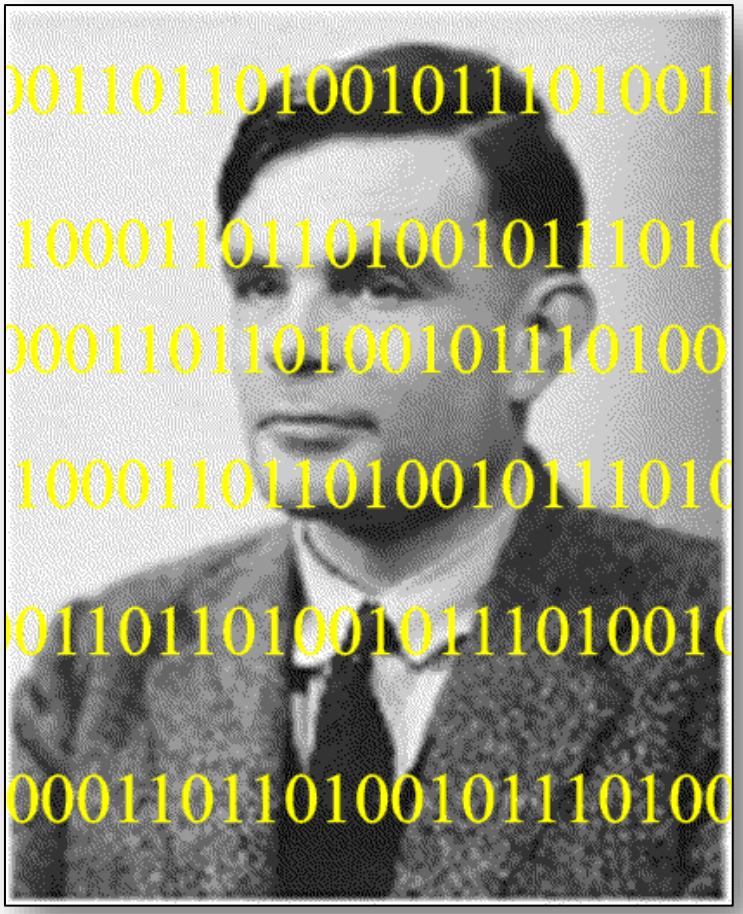
Tommy Flowers invented a computer called Colossus which was the world's first electronic, digital, programmable computer.

It was HUGE.

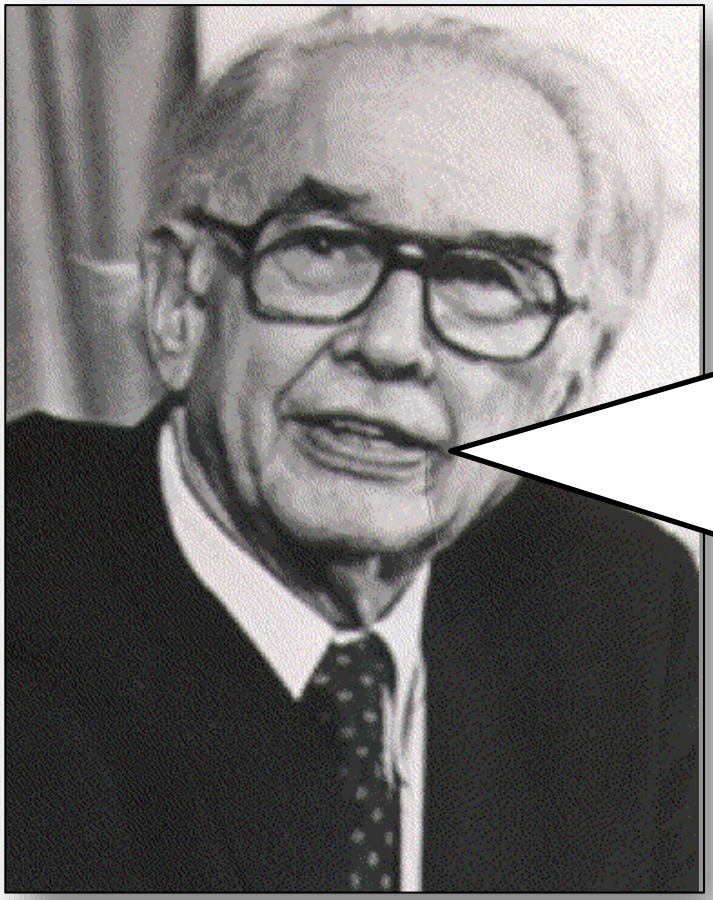


Alan Turing

Alan Turing published a paper called *On Computable Numbers, with an application to the Entscheidungsproblem*. The paper proved that a machine capable of processing a stream of 1s and 0s according to programmed instructions would be capable of solving any problem.



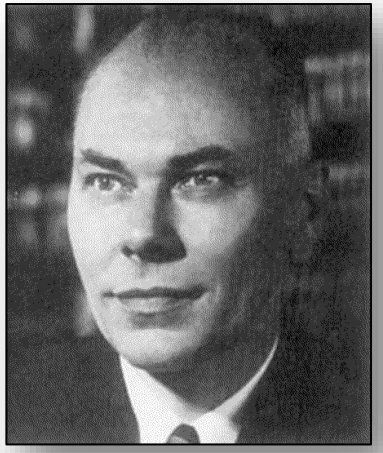
John Vincent Atanasoff



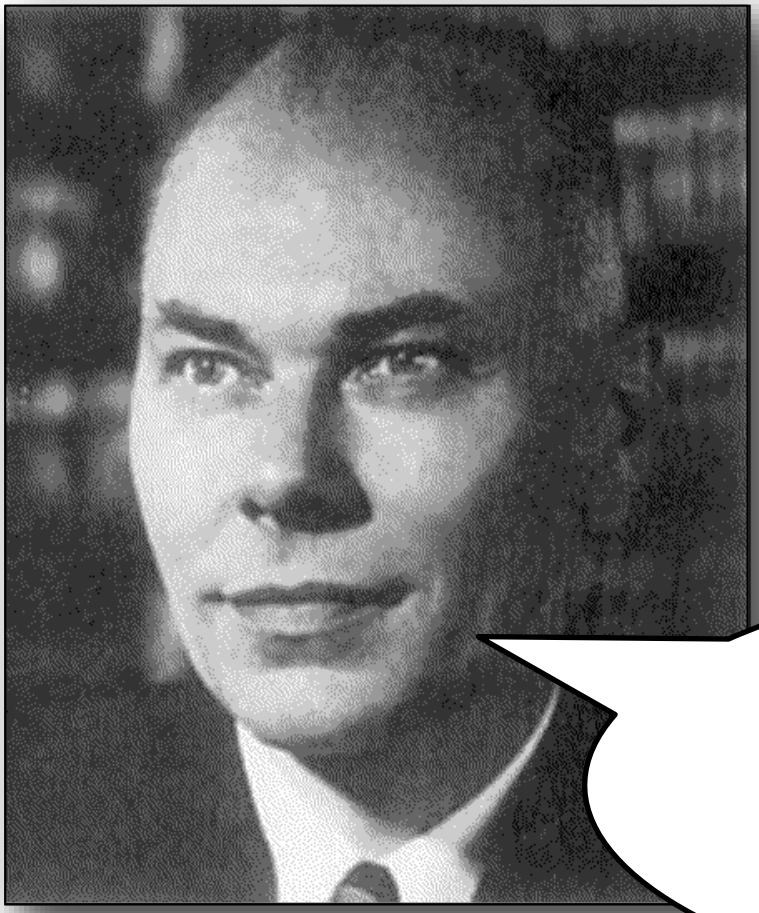
I invented the ABC, a digital computer, so-called because it processed data using 1s and 0s. Being binary, the data could easily be represented electronically since switches naturally have two states—on and off.

Howard Aiken

In 1944, while a professor of physics at Harvard, Howard Aiken was supported by IBM to build the ASCC computer (Automatic Sequence Controlled Calculator). The computer had mechanical relays (switches) which flipped backwards and forwards to represent mathematical data. It was huge and weighed 35 tons with 500 miles of wiring.



Howard Aiken



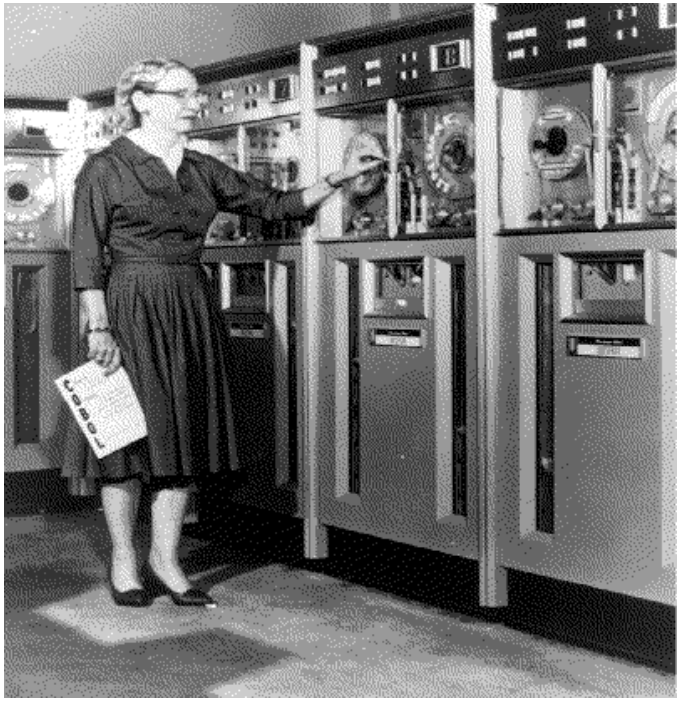
As computers were so large and were purpose built for each company, they tended to be very expensive. Howard Aiken was asked about the future of electronic computers. His answer was as follows…

I estimate that six electronic digital computers would be sufficient to satisfy the computing needs of the entire United States.

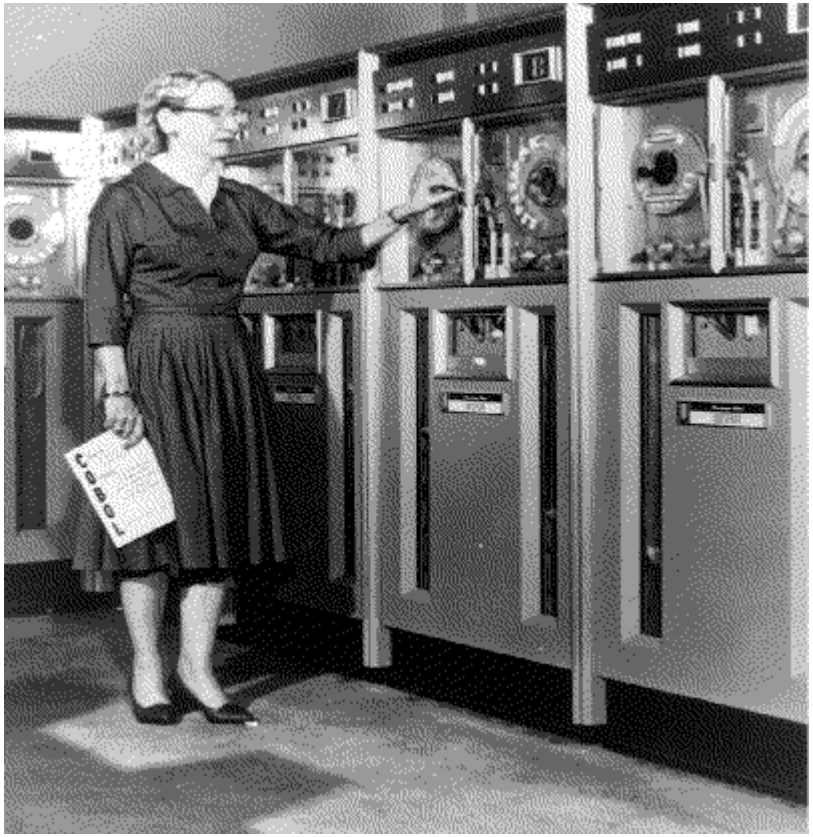
Dr. Grace Murray Hopper

Rear Admiral Dr. Grace Murray Hopper, worked with Howard Aiken from 1944 and used his machine for gunnery and ballistics calculation for the US Bureau of Ordnance's Computation project.

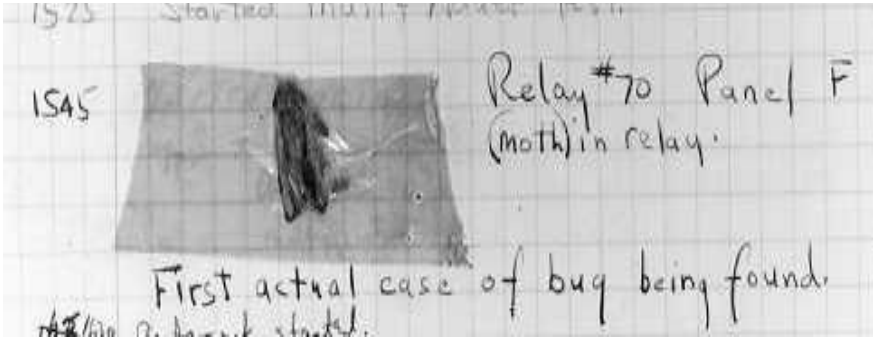
Dr. Hopper greatly simplified programming by inventing the "COBOL" language which was the first programming language to use English for variable names and logical operations rather than machine code.



Dr. Grace Murray Hopper



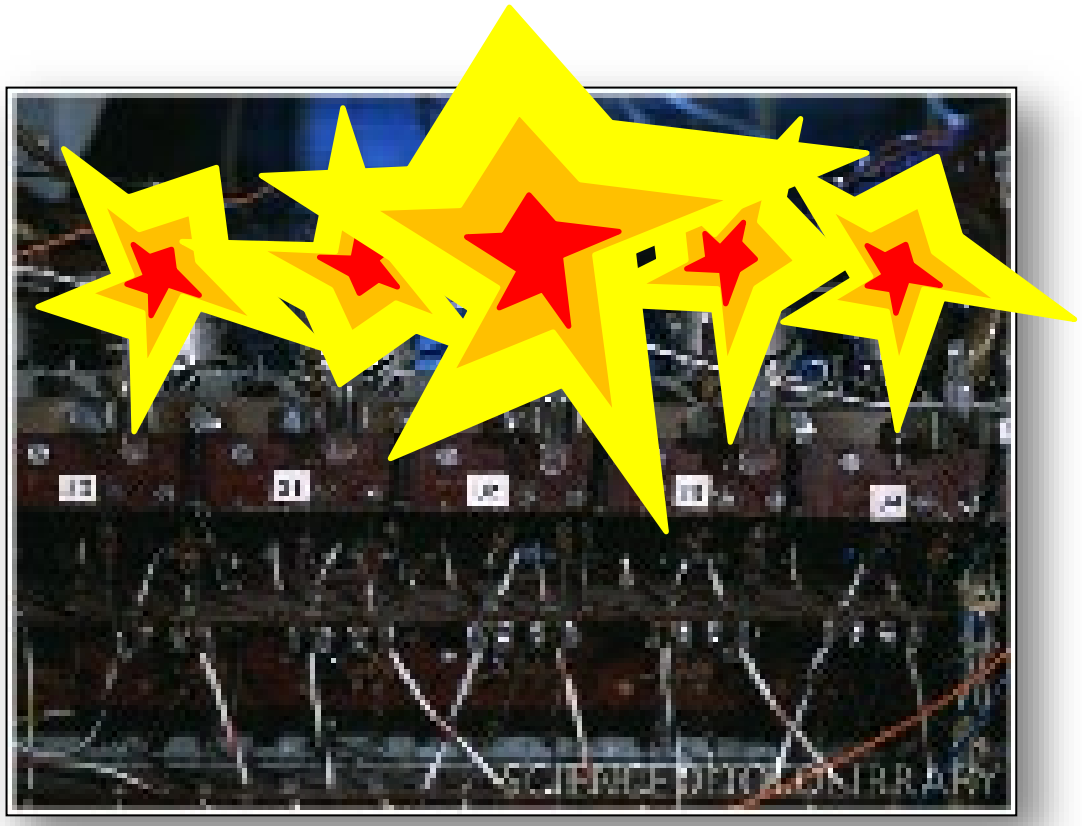
She also invented the term “debugging” when a moth flew into the computer and caused an error.



Valves

Computers used values which were very big and bulky and tended to overheat and blow up.

This made them unreliable.



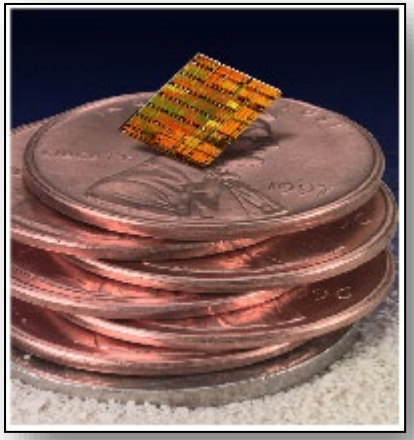
Jack Kilby

Jack Kilby invented the first integrated circuit in 1959, which meant computers could become smaller and more reliable.

These were first used inside calculators.

Microelectronics Revolution

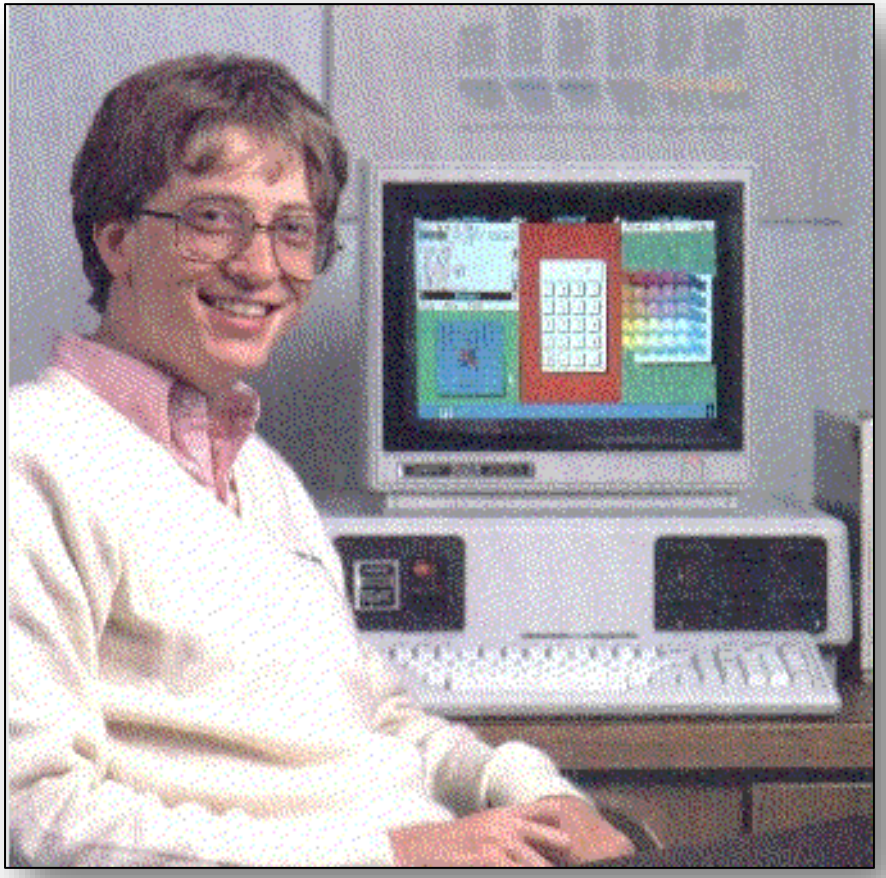
The microelectronics revolution allowed the amount of hand-crafted wiring seen on the left to be mass-produced as an integrated circuit the size of your thumbnail.



Bill Gates

At the age of 13 Bill Gates became interested in programming computers.

He sold a computer he built and programmed to Seattle to allow them to count their city traffic when he was still a teenager.



Bill Gates

Whilst at Harvard University he developed a programming language for his computer.

He decided to drop out of university so he could concentrate all his time writing programs for his computer and started a company called Microsoft to develop software for the newly emerging personal computer market.

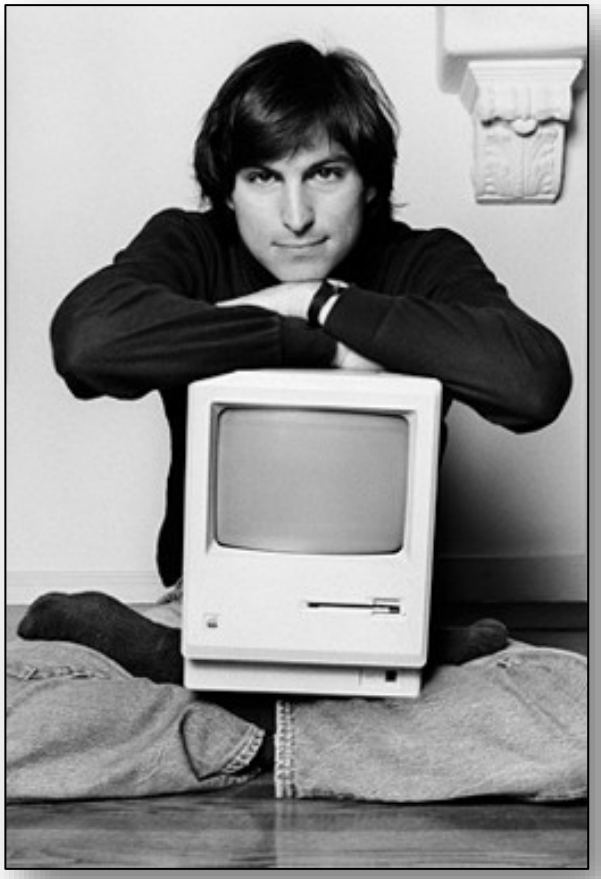
Bill Gates

Bill Gates managed to talk IBM into letting Microsoft make the operating system and Gates proceeded to make a fortune from MS-DOS.

Over the next few years he made billions of dollars and has donated a lot of his fortune to improving the lives of people in developing countries.

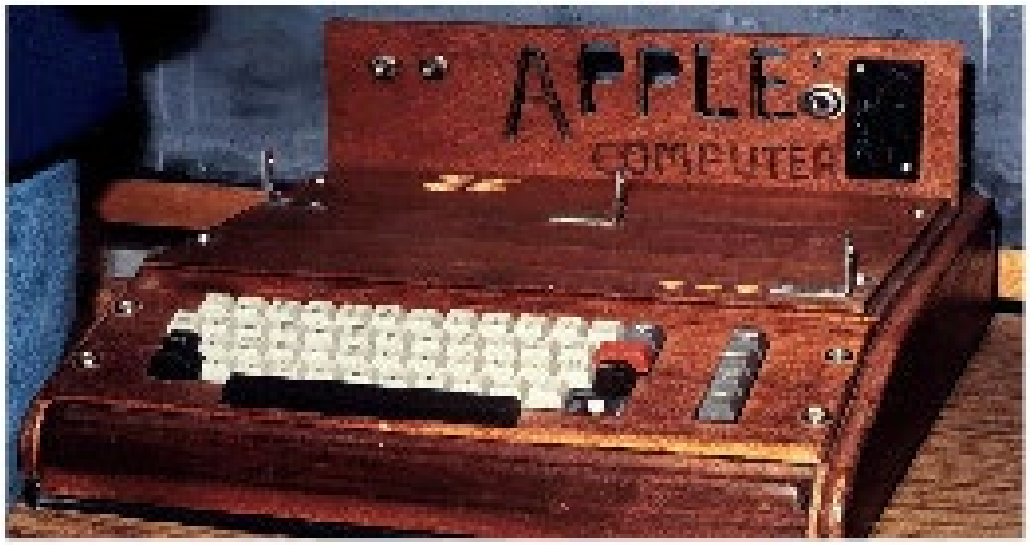
Steve Jobs

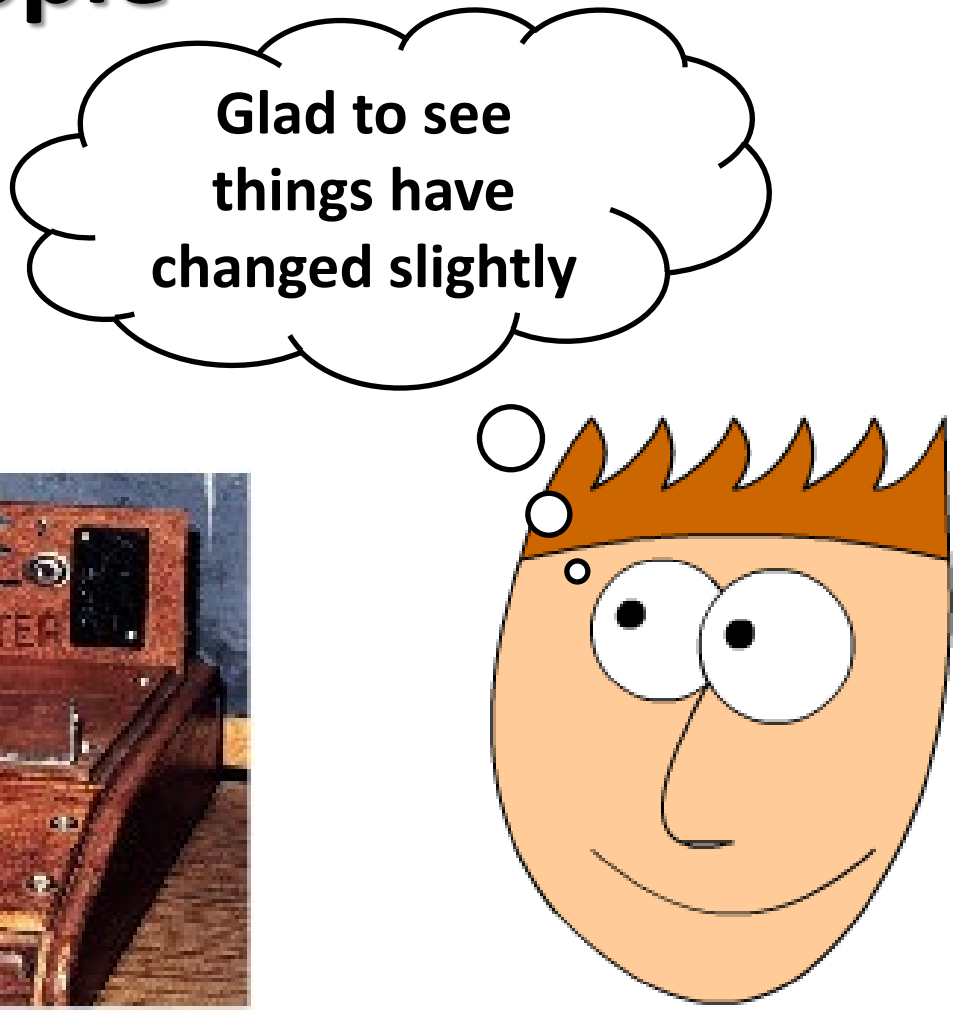
Steve Jobs also dropped out of university at the age of 21 to start his company Apple with another college dropout Steve Wozniak.



Apple

In 1976 this “Apple I” was one of the first home computers and was sold for $600





Steve Jobs

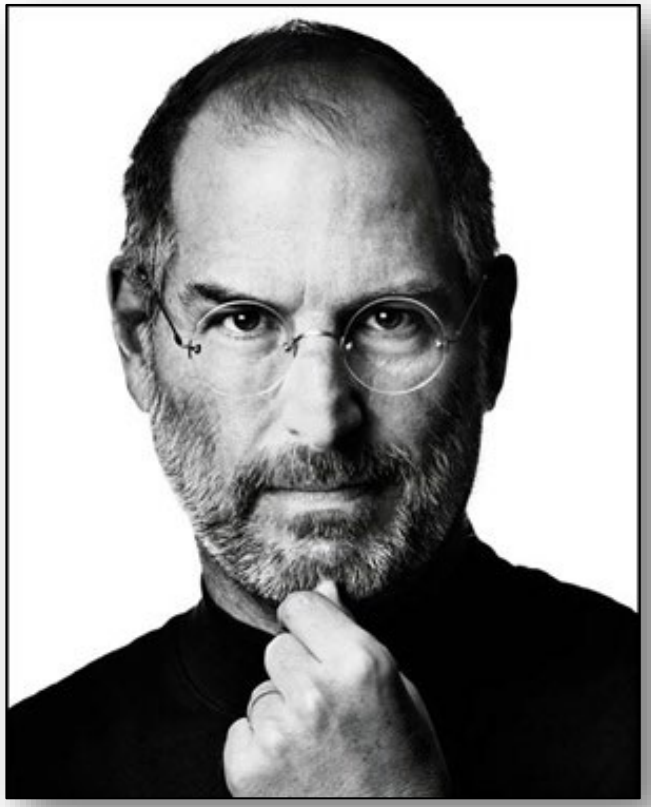
The immense success of Apple 2 revolutionised the personal computer market with the invention of the Graphical User Interface (GUI) which made using the computer very user friendly.

This made Steve Jobs a millionaire at the age of 25.

Steve Jobs

In 2000 digital music players were big and bulky or small but played terrible quality music.

Apple saw the opportunity and announced the release of the iPod in 2001, the first digital portable music player which changed the course of media entertainment and was followed with equal success by the iPhone and iPad.



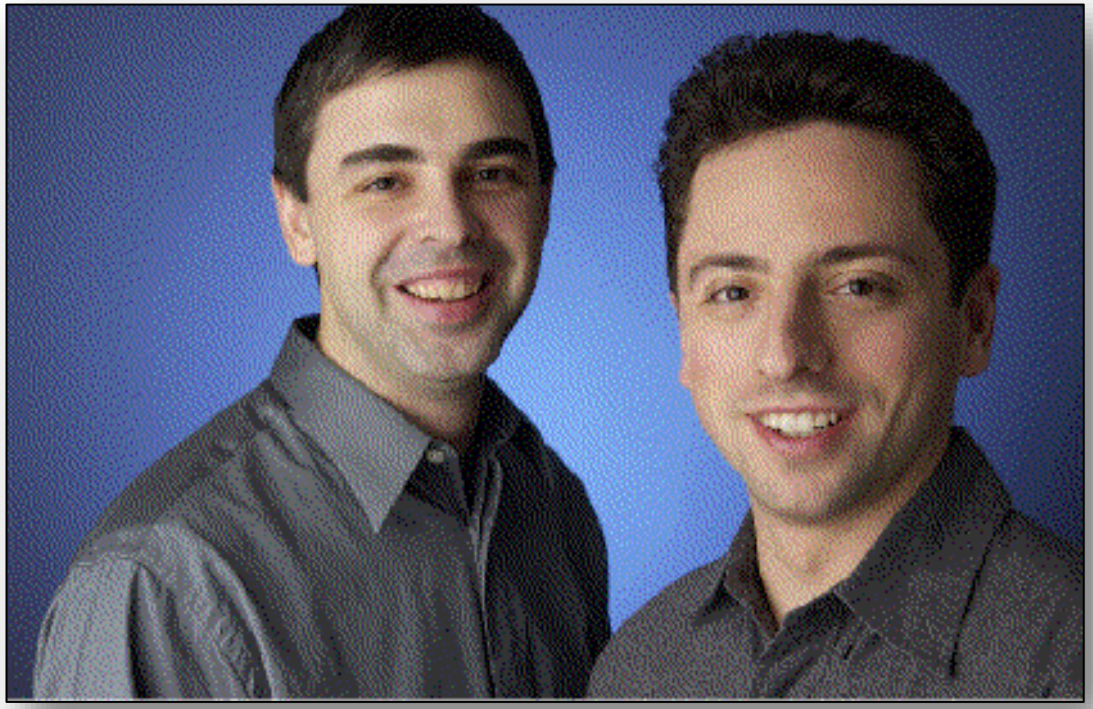
1955 - 2011

Microsoft v Apple

- In 1994 Apple took Microsoft to court to prevent them using the Graphical User Interface (GUI) components that Apple invented.
- Apple didn't win the case but Microsoft were told to change the "Trash can" icon on the desktop as it was too similar to Apple's version.
- Microsoft changed it to the Recycle Bin.
- In 1998 Microsoft was valued at $344.6 billion and Apple was only $5.54 billion.
- By 2011, Apple was valued at $346.7 billion whilst Microsoft was worth $214.3 billion. This was the first time that Apple had edged ahead.
- This change is put down to the success of digital music players and smart phones.

Larry Page and Sergey Brin

Larry Page and Sergey Brin met at Stanford University. They began to work on developing a search engine called “BackRub”



Google

They decide to rename BackRub to Google – a play on the word “googol” a mathematical term for the number 1 followed by 100 zeros.

This was to show that it was their mission to organise the seemingly infinite amount of information on the internet.

Google

From a small company that started in a garage to one of the world's largest companies with many diverse areas such as its own email system known as Gmail, Google Maps and Google Books.

On average, Google has been acquiring a company a week since 2010 including YouTube, Motorola Mobility and Android.

In 2011 Google was estimated to be worth $185.1 billion.

ANDROID

MOTOROLA

Key points in modern computing history

1984: Apple introduces the Macintosh computer

1990: Microsoft introduces Windows 3.0

1992: Microsoft introduces Windows 3.1

1996: BackRub was created and launched onto Stamford Universities' servers

1997: BackRub given a new home and changed to the name Google.

2000: Bill Gates relinquishes his title as head of Microsoft and Microsoft Windows 2000 was released

2001: Wikipedia was founded

2001: Microsoft Windows XP is released

2005: Google purchases Android

2005: YouTube was founded and appears online

2006: Google buys YouTube

2006: Nintendo releases the Wii

2007: Apple introduces the iPhone

2007: Microsoft releases Microsoft Windows Vista and Office 2007

2010: Apple introduces the iPad

Try to complete task 1 & 2

History of Computers task 1

Name:		Class:	

You are going to learn about the development of computers. Whilst you are listening, fill in this sheet with key facts.

Question.	Your answer
1. Who was the first to use an abacus?	
2. Why did Pascal invent the first calculator in 1645?	
3. What does the "Stepped Reckoner" do that Pascal's machine couldn't?	
4. Who invented the "Difference Engine" and "Analytical Engine"?	
5. Who helped Babbage in his work?	
6. What happened at Bletchley Park in World War 2?	
7. Who invented the machine known as "Colossus"?	
8. Who proved that a machine capable of processing a stream of 1s and 0s was capable of solving any problem?	

History of Computers Task 2

Name:		Class:	

Task 1: Put the following key points in computer history into the correct order by numbering them 1 to 13 with 1 being the earliest event and 13 being the most recent event. You may need to do some research to help you complete this task.

Event	Order in History
Charles Babbage drew up the plans for The Difference Engine while still a student at Cambridge University.	
Steve Jobs also dropped out of university at the age of 21, to start his company Apple.	
Alan Turing proved that a machine capable of processing a stream of 1s and 0s would be capable of solving any problem.	
John Napier invented "logarithms" to help reduce errors when performing calculations.	
Dr. Hopper developed the programming language known as COBOL.	
Joseph-Marie Jacquard used punched cards to control his weaving looms.	
Lady Augusta Ada was the first computer programmer and created programs for Babbage's machines.	
Pascal invented a calculator to help work out taxes.	
Howard Aiken claimed that six electronic digital computers would be sufficient to satisfy the computing needs of the entire United States.	
Apple announced the release of the iPod.	
Tommy Flowers invented "Colossus", the world's first electronic, digital, programmable computer.	
YouTube was founded.	
Bill Gates sold a computer that he had built and programmed to Seattle to allow them to count their city traffic.	

Extension Activity: Find out 3 more facts about each computer entrepreneur, Bill Gates and Steve Jobs which have not been covered in the lesson. Write them on the back of this sheet.