**Level 1: Charles Babbage & Ada Lovelace**

1. Who was Charles Babbage?
   1. When and where was he born?

December 26, 1791, London, United Kingdom

* 1. What was his main contribution to computer science?

Babbage is credited with inventing the first mechanical computer that eventually led to more complex electronic designs, though all the essential ideas of modern computers are to be found in Babbage's analytical engine

1. What is the "Difference Engine" proposed by Charles Babbage?
   1. What did it do?

Automatic mechanical calculator designed to tabulate polynomial functions.

* 1. How did it work?

Its name is derived from the method of divided differences, a way to interpolate or tabulate functions by using a small set of polynomial coefficients. Most mathematical functions commonly used by engineers, scientists and navigators, including logarithmic and trigonometric functions, can be approximated by polynomials.

* 1. How was it similar to modern computers?

1. Who was Ada Lovelace?
   1. When and where was she born?

December 10, 1815, London, United Kingdom

* 1. What was his main contribution to computer science?

English mathematician and writer, chiefly known for her work on Charles Babbage's proposed mechanical general-purpose computer, the Analytical Engine. She was the first to recognize that the machine had applications beyond pure calculation, and published the first algorithm intended to be carried out by such a machine.

* 1. What is the computer language that is named after her?

Ada, the language, was developed in the early 1980s for the U.S. Department of Defense

1. What is the "Analytical Engine" worked on by Ada Lovelace?
   1. What did it do?

The Analytical Engine was a proposed mechanical general-purpose computer designed by English mathematician and computer pioneer Charles Babbage.

* 1. How did it work?

the logical structure of the Analytical Engine was essentially the same as that which has dominated computer design in the electronic era. The Analytical Engine is one of the most successful achievements of Charles Babbage.

* 1. How was it similar to modern computers?

**Level 2: Alan Turing**

1. Who was Alan Turing?
   1. When and where was he born?

June 23, 1912, Maida Vale

* 1. What was his main contribution during World War II?

Turing served the Allied forces by breaking German military codes, particularly those used by the German navy.

* 1. What were his main contributions to computer science after World War II?

Turing Test: turing was also involved in philosophical debates over whether machines could think like a human brain. He devised a test to answer the question. He reasoned that if a computer acted, reacted and interacted like a sentient being, then it was sentient.

1. What is the "Enigma" that Alan Turing worked on during World War II?
   1. What was the "Enigma code" used by the Germans and how did it work?

The Enigma was a type of enciphering machine used by the German armed forces to send messages securely.

* 1. Why was it so important for Britain to "crack" the Enigma code?

It was important for Britain to crack the Enigma code because Germany was severely destroying Britain and they were winning the war. Britain needed to crack to code in order to figure out what Germany next move is.

* 1. How did Alan Turing solve the puzzle?

The Bombe machine, designed by British mathematician Alan Turing at Bletchley Park during the early stages of World War II, was crucial to cracking German communications encoded by the Enigma machine.

* 1. Why was Turing's work kept top secret?

It was top secret so that the Germans would not be able to get the machine in order to attack Britain even more.

1. Many people call Alan Turing the "Greatest Unknown Hero of World War II". Provide some examples of the impact of his work that would support this claim.

-he saved Britain in a sense as he crack the code of the Germans

-he made a historic machine

1. How did being gay affect Alan Turing's life and work as a computer scientist?
   1. How did being gay affect his work during World War II?

He did not get much credit as he was supposed to for helping Britain because he was gay and that was a crime in England at the time.

* 1. How did being gay affect his work after World War II?

He was arrested and was humiliated in front of everyone. This caused people to hate on him just because of his sexuality.

* 1. How did Alan Turing's life end?

He committed suicide in 1954 after feeling humiliated of being gay.

1. Many people call Alan Turing the "Father of Computer Science". Provide some examples of the impact of his work that would support this claim.

Cracking the Enigma Machine during WW2

Turing Machine

Turing Test

**Level 3: Other Great Contributors**

1. Who was John von Neumann?
   1. When and where was he born?

December 28, 1903, Budapest, Hungary

* 1. When and why did he move to America?

He moved to America to purse his career as a lot of people were moving to America after Europe was in a bad place at the time.

* 1. What was his contribution to mathematics & science?

John von Neumann made foundational contributions to ergodic theory, a branch of

mathematics that involves the states of dynamical systems. Von Neumann founded the

field of continuous geometry.

* 1. What was his contribution to computer science?

His contribution to computer science was that he worked on the philosophy of Artificial

Intelligence with Alan Turing.

1. What was the "ENIAC" computer and the "von Neumann Machine"?
   1. What did it do and how did it work?

It was among the earliest electronic general purpose computers made, it was digital and

able to solve a large class of numerical problems through reprogramming

* 1. How is it related to modern computers?

This computers were built hust to do math but modern computers can do way more than that.

* 1. Explain how a "von Neumann Machine" applies to modern PCs.

VM Machine was a

stored program digital computer that keeps both program instructions and data in

read-write, and there was a RAM.

1. Who was Grace Hopper?
   1. When and where was she born?

December 9th 1906 in New York City, New York, United States

* 1. What were some of her contributions to computer science?

She was one of the first programmers of the Harvard Mark I computer.

1. What was the "COBOL" computer language that Hopper helped to develop?
   1. How was COBOL different from other computer languages of the time?

COBOL is only used for business, finance, and administrative systems for

companies and governments.

* 1. Is COBOL still in use today? Explain your answer.

COBOL is still used till today but is on decline because of retirement of experienced COBOL programmers but now the programs are

being migrated to new platforms, it is now rewritten in modern languages or replaced

with software packages.

1. Who is Tim Berners-Lee?
   1. When and where was he born?

June 8th 1955 in London, England.

* 1. Why was he knighted by Queen Elizabeth II?

He was knighted because of his work in computer science and being from England.

* 1. What is his contribution to computer science?

He was the inventor of the world wide map.

1. List some ways that your life would be different if Tim Berners-Lee did not invent the World Wide Web.

Would have spent less time on technology

Would be doing more physical things

Would not be too much into technology

**Level 4: Presentation**

Pick one of the above "heroes" of computer science and prepare a brief presentation about their life and contributions.

Your presentation will be shared with other students in the class in a "trade show" format. (When we return form Christmas break.)

Your presentation should be shared with Mr. Nestor through Google Docs or via email at p0079141@pdsb.net.