Republic of the Philippines
Department of Education
REGION III
SCHOOLS DIVISION OFFICE OF NUEVA ECIJA

LEARNING ACTIVITY SHEET

SPECIAL PROGRAM IN ICT 7
OFFICE PRODUCTIVITY 7
First Quarter, Week 3

History of Computer

BACKGROUND INFORMATION FOR LEARNERS

According to the philosopher George Santayana, "*Those who do not learn from history are destined to repeat it*".

Without keen understanding of the past we cannot come up of what we have now. Hence, there is a relationship between past, present, and future. As we learn about computers, have you ever wander of what a computer looks like before?

THE COMPUTER AND ITS ORIGIN

The word computer comes from the word *to compute* which means *to calculate*; so computer is a calculating device that perform calculations at enormous speed such as preparing reports, calculations, transactions, scientific works etc.

The earliest civilizations were no computers and calculators. Prehistoric people did not have much data to count so the most way to count was through their fingers. This method did not meet their needs so they used pebbles to perform arithmetic.

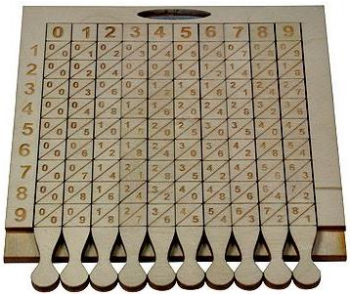
As time goes by, more innovations in calculation were introduced. Technology had been able to produce a handheld and inexpensive calculator that was able to perform from simple to complex arithmetic operations.

A. MANUAL COMPUTING DEVICES

1. ***Abacus*** *(12th century A.D.)* - considered as the earliest device for calculation which was developed in China. It has a frame with beads strung on wires or rods. It is popular because it is simple and easy to use.

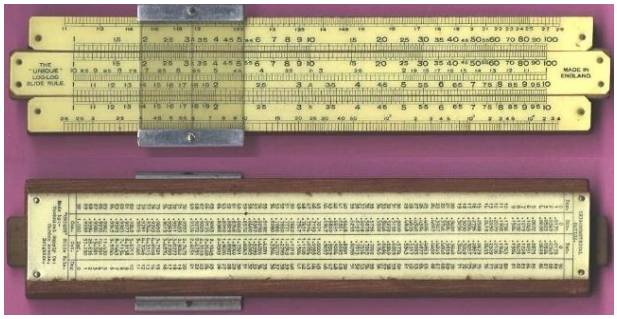
https://www.origin.fr/du-boulier-au-pc-les-origines-de-lordinateur/

2. ***Napier's Bone/Rod*** *(1617)* – this tool is made up of multiplication tables inscribed in a wood or bone. It was named after its inventor, Scottish Mathematician John Napier.



https://www.timetoast.com/timelines/the-history-of-computers-eede204f-3243-4958-8f1c-7402b515e34c

3. ***Oughtred's Slide Rule*** *(1620)* – considered the forerunner of modern day analog device. It was invented by William Oughtred, this is a single straight two-foot long ruler plotted with a logarithmic scale. Multiplication and division are done by using a pair of dividers.



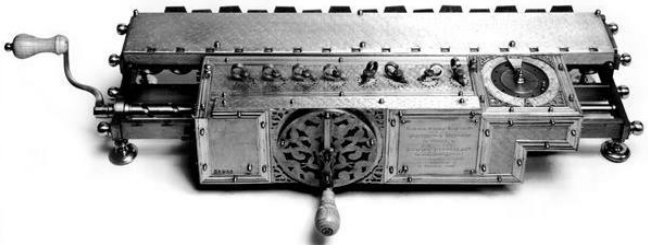
https://www.sliderulemuseum.com/British/P020_English_mini-rule.jpg

B. MANUAL MECHANICAL CALCULATORS

1. ***Pascaline/Pascal's Calculator*** *(1642)* – considered as the first operational calculating machine that could add large numbers. Invented by Blaise Pascal, a French Mathematician.

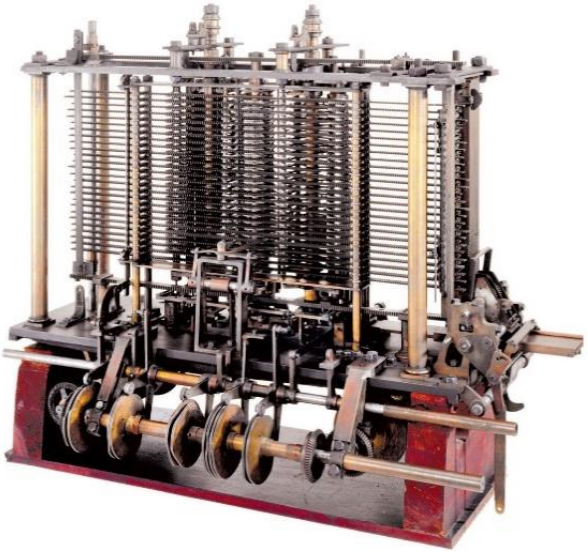
https://www.i-programmer.info/history/9-machines/517-the-prehistory-of-computers.html?start=1

2. ***Leibniz's Calculator/Stepped Reckoner*** *(1670)* – Gottfried von Leibniz improved the Pascaline. It utilized the same techniques for addition and subtraction as Pascal's device but could also perform multiplication and division as well extract square roots.



https://www.computerhistory.org/revolution/calculators/1/49

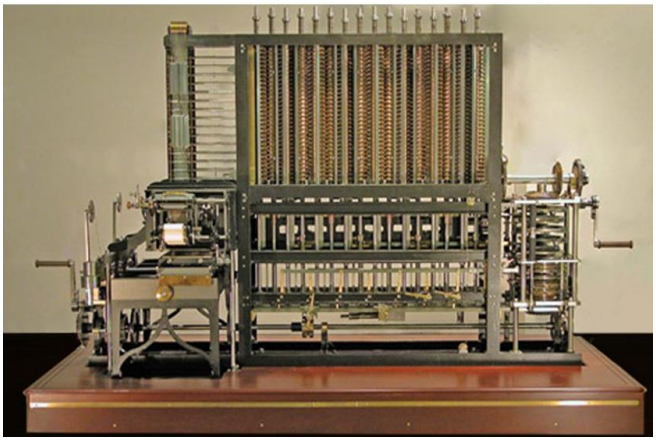
3. ***Difference Engine*** *(1822)* – Charles Babbage, an English Mathematics professor, proposed a machine to perform differential equations called *Difference Engine*. It was powered by steam and large locomotors. It stored programs, performed calculations, and printed results automatically.



https://european-people-history.com/art4767/

4. ***Analytical Engine*** *(1830)* – developed as the first calculating machines that could be labelled a computer and designed to be as a general-purpose computer.

In the mid-19th century it became the *World's First Digital Computer* that named Charles Babbage as the *Father of Modern Computer*. Lady Ada Augusta Byron was then known as the *World's First Computer Programmer* after helping Babbage developed this computer.



https://www.pinterest.ph/pin/255368241340219711/

C. ELECTROMECHANICAL COMPUTER

1. ***Hollerith's Punched Card Machine/Tabulating Machine*** *(1890)* –

   For census of the U.S. Census Bureau, Dr. Herman Hollerith invented a tabulating machine and card sorter capable of representing, reading, and assembling data. His Tabulating Machine Company's name was changed to *International Business Machine* in 1924.

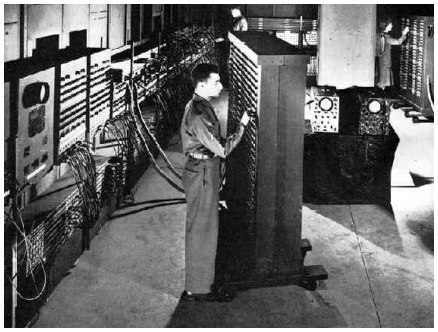
http://www.rudimathematici.com/archivio/109.pdf

D. ELECTRONIC COMPUTERS

1. ***Mark I*** *(1944)* – invented by Howard Aiken of Harvard University that could perform the four mathematical operations in a specified sequence determined by the setting of switches. It was used for 15 years. *Grace Hopper*, a programmer, coined the word *bug* after she found that a bug in Mark I had made the system stop. The official name of MARK I was *Automatic Sequence Controlled Calculator* and was the *First Automatic General-Purpose Digital Computer.*

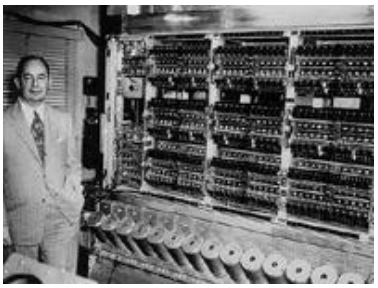
https://gazeta.ua/articles/science/_17-metriv-dovzhinoyu-ta-vagoyu-45-tonni-zyavivsya-pershij-u-sviti-kompyuter/852320

2. ***Electronic Numeric Integrator and Calculator - ENIAC*** *(1943-1946)* – designed and constructed by John Presper Eckert Jr. and John Mauchly. ENIAC was capable to store problem calculations and it was programmable. Considered as the *First Large-Scale Vacuum Tube Computer.*



https://pt.slideshare.net/ispkosova/week3-intro-to-computer-history-of-comps-comps-in-everyday-life

3. ***Electronic Discrete Variable Automatic Computer – EDVAC*** *(1946)* – a Hungarian born Mathematician John von Neumann proposed a modified version of ENIAC.



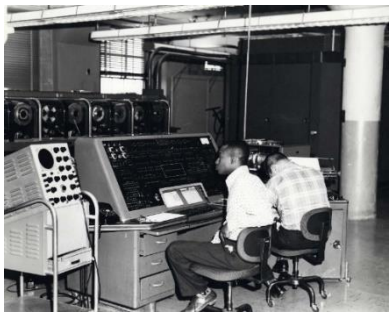
https://www.researchgate.net/figure/John-von-Neumann-y-la-EDVAC_fig3_316559100

4. ***Electronic Delay Storage Automatic Computer - EDSAC*** *(1949)* – it was built by Maurice Wikes of Cambridge University. This computer was capable of storing a sequence of instructions and the *First Electronic-stored Program Computer.*

https://www.britannica.com/technology/EDSAC

5. ***Universal Automatic Computer - UNIVAC*** *(1950)* – it was introduced by Remington Rand and became the *First Commercially available Computer.* It could calculate at the rate of 10, 000 additions per second. In 1952, it received national attention when it predicted Dwight D. Eisenhower's victory in the presidential election.

https://steemkr.com/life/@mohsan0073/evolution-in-computers-that-totally-changed-the-world



GENERATIONS OF COMPUTER

Computer generations describe the computer history according on how technologies were evolved in terms of development such as computer circuitry, size, parts that have been miniaturized, processing and speed doubled, larger memory capacity, and usability and reliability that changes computer operation.

FIRST GENERATION (VACUUM TUBES) 1940 – 1956

These computers used over 17, 000 vacuum tubes that were huge and almost occupied the entire rooms. They were expensive to operate because they need more electricity. These inefficient materials generated a lot of heat causing computer breakdown.

These computers were relied merely on machine language and can only solve one problem at a time. Punched cards and paper tape were used as input. Output came out on printouts. The two notable machines during this era were the UNIVAC and ENIAC.

SECOND GENERATION (TRANSISTORS) 1956 – 1963

The advent of second generation of computing was the substitution of vacuum tubes by the transistors. While first developed in 1947, they were not used considerably in computers until the end of the 1950s. Transistors were more advance over the vacuum tube but still the issue to computers to damaging levels of heat remain. They still relied on punched card for input/printouts.

The early versions of those machines were developed for the industry of nuclear energy.

THIRD GENERATION (INTEGRATED CIRCUITS) 1964 – 1971

At this stage, transistors were being miniaturized and putting of silicon chips called *semiconductors*. *Jack Kilby*, an engineer of Texas Instruments developed the *Integrated Circuits* (ICs). This led to a huge increase in speed and efficiency of those machines and brought a big spring up from the printouts and punch cards.

The user can interact using monitor and keyboard and interfaced with the Operating System resulting to machine more advance, low-cost and size reduction.

FOURTH GENERATION (MICROPROCESSORS) 1972 – 2010

It is often summed in one word: *Intel*. In 1971, Intel 4004 chip was advanced and put all computer components on a solitary chip. Through this, an occupied room in 1940s is now likely fit in hand's palm.

Happening in 1981, the IBM which the first ever computer was made intended for home use and in 1984 Macintosh was announced by Apple.

The improved power of these small computers inevitably be linked to create networks which ultimately led to the event, birth and rapid evolution of the web.

The use of GUI, the mouse and the progress in laptop ability and hand-held devices were among major developments during this period.

FIFTH GENERATION (ARTIFICIAL INTELLIGENCE-AI) 2010- Beyond

AI along with computer devices integration are still in development, but a number of these technologies are starting to emerge and be used like voice recognition.

Artificial Intelligence possibility may be a reality through multiprocessing and superconductors. Leaning to the longer term, computers are going to be fundamentally transformed by molecular, quantum calculation, and Nano technology.

The core of fifth generation is to use these technologies that eventually create machines which may process and answer tongue, and have capability to find out and organize themselves.

TYPES OF COMPUTERS

Computers could also be classified consistent with their features and uses. Different group of people choose computers depending on their needs. Given below are the different types of computers:

1. SUPERCOMPUTER

An extremely fast computer which will perform many instructions per second. Supercomputers are very costly and employed only for specified applications that need massive amounts of mathematical calculations such as for meteorology, scientific models, animated graphics, fluid vibrancy calculations, atomic energy exploration, electronic designs, and geological data analysis.

https://www.tecnocino.it

The best known producer of supercomputer is *Cray Research*.

2. MAINFRAME COMPUTER

Mainframe computer is a very bulky and expensive computer but capable of associating hundreds, or maybe thousands, of users instantaneously.

In certain ways, mainframes are more powerful than supercomputers because they support more programs simultaneously. Nevertheless, supercomputers can only perform a particular program faster than a mainframe.

Mainframe is generally used in hospitals, airlines and banks.

https://icteducationcentre.blogspot.com

3. MINICOMPUTER

It is a midsize computer capable to support up to 200 users at once. This type is preferred to use by colleges, small businesses, and similar establishments.

4. WORKSTATION

Workstation is a single-user computer but has more powerful microprocessor and, generally, had a better quality monitor.

It is used in engineering applications (e.g. CAD/CAM), publication, software development, and other sorts of applications that need a moderate amount of computing power and comparatively high quality graphics capabilities.

5. PERSONAL COMPUTERS

Describe as small and single user computer-based, quite economical and is designed for individual user.

Businesses use personal computers for data processing, accounting, publication, and for running spreadsheet and management applications. At home, the foremost popular use for private computers is for enjoying games and recently for surfing the web.

TYPES OF PERSONAL COMPUTERS

Personal computers are classified consistent with size and case. A case is the metal frame that houses and supports different internal parts of computer.

Basic Types of Personal Computers

Tower model

Tower computers are narrow and high. The foremost advantage of tower models is that there are less space constraints which make the additional storage devices installation easier.

Desktop model

Is designed to suit securely on the top of desk. Desktop computers describe as low and broad, very small and are sometimes stated as *slim line models.*

Portable computer

A portable computer may be a PC that's designed to be easily transported and relocated.

Types of Portable Computers

a. Notebook computer – is a personal computer that is very lightweight. It uses a range of techniques, referred to as flat-panel technologies, to supply a light-weight and non-bulky monitor. It can also be run by a rechargeable battery.

b. Subnotebook computer – it has a smaller keyboard, screen and is slightly lighter than a full-sized notebook computer.

c. Laptop computer – is small movable computer adequately small that can sit on lap. Laptop computer is also called notebook computer.

6. HAND-HELD COMPUTERS

A portable computer that is sufficiently small to be held by a hand. Even really convenient to hold, it did not replaced notebook computers due to their small keyboards and screens. Hand-held computers include the following:

Palmtop

Small computer that exactly fits into the palm. It can surely functions like phone books and calendars.

Personal Digital Assistant (PDA)

A handheld device that function as a telephone, fax sender, and private organizer. Most of the PDAs use stylus instead of a keyboard and are pen - based.

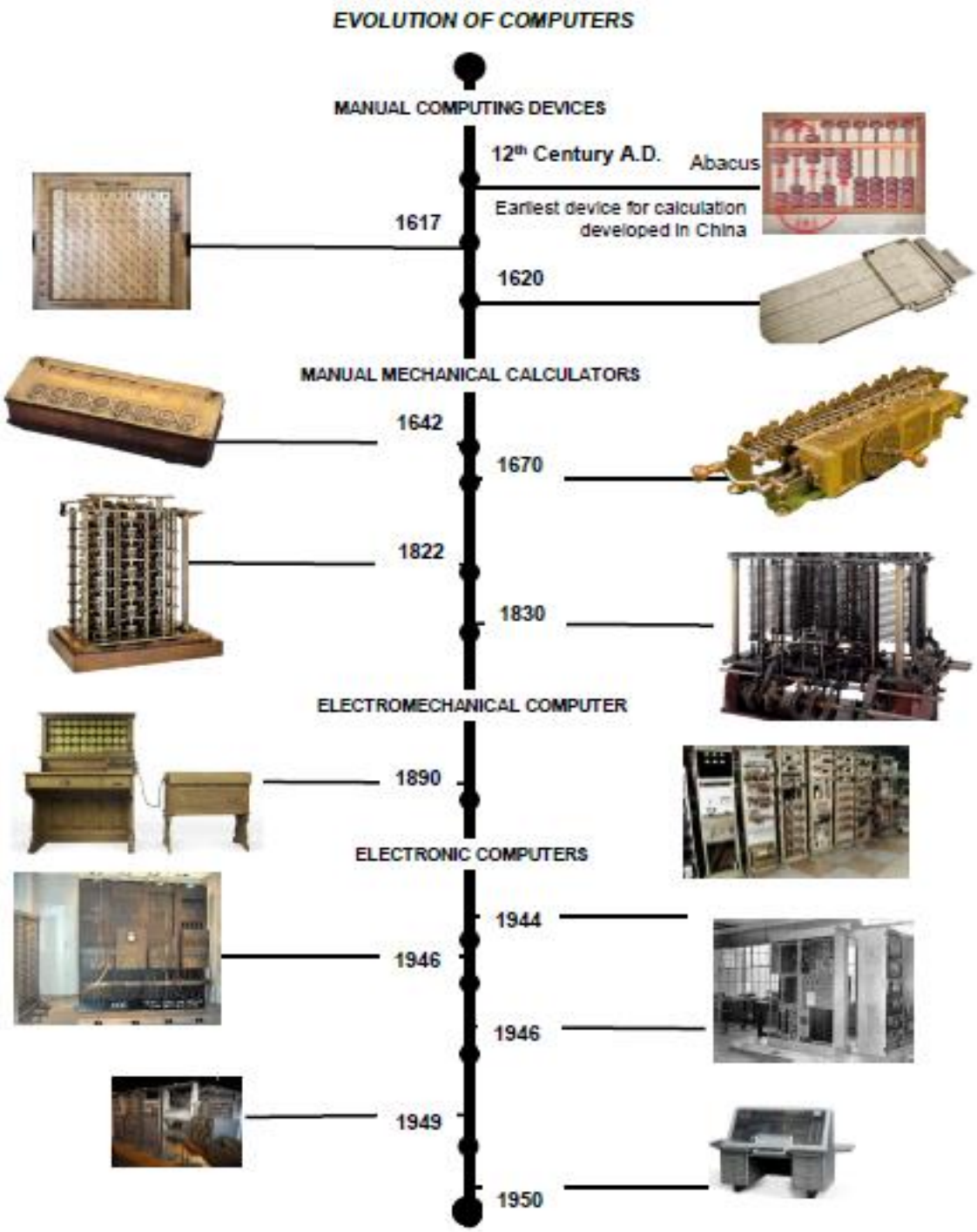
LEARNING COMPETENCY

To trace the history of computers.

ACTIVITIES

ACTIVITY 1

Directions: Below is the timeline of *Evolution of Computers* from manual computing devices to electronic computers. Name the device and give the important events or information happened to complete the illustration.



ACTIVITY 2

***Directions*:** Based on the discussions about *Generation of Computers*, fill up the spaces on the table by choosing the given data below.

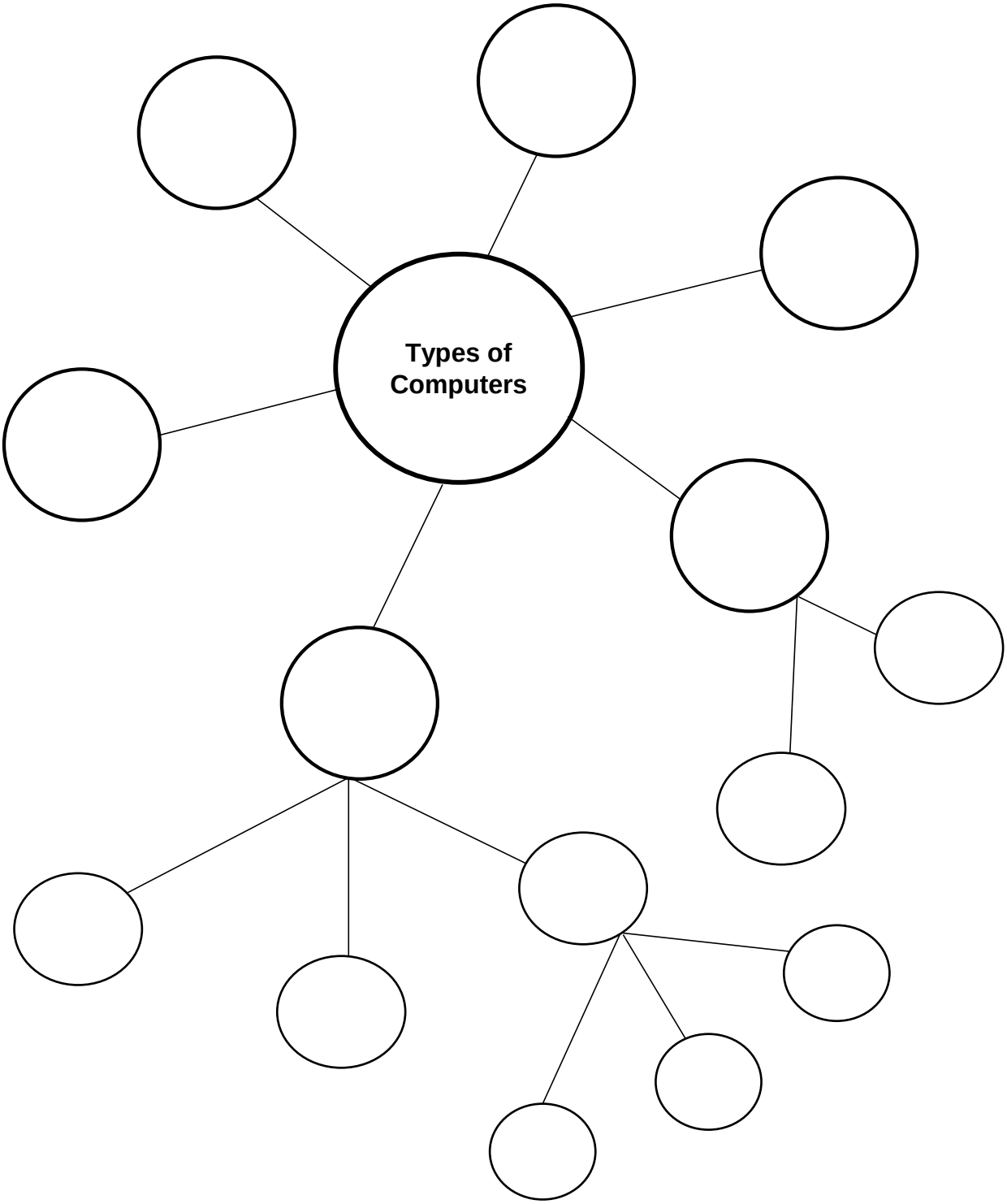
Microprocessor	Artificial Intelligence	Integrated circuits	Transistors and diodes
Much smaller, faster, and more powerful, multi-functional	Huge and occupied the entire rooms, expensive to operate, lasted only for 12 hours	Voice recognition emerge, can learn logic and reasoning	Started to use OS, compact, reliable, less expensive
CRAY I, CRAY X-MP, CYBER 205, MITS Altair 8800, microcomputers	Desktop computers, laptops, palm computers, Pentium computers	Z3, Colossus, Mark I, EDVAC, EDSAC UNIVAC, ENIAC	IBM 604, STRETCH, LARC, IBM 1401 (Model T), HONEYWELL400, PDP-8
Digital Equipment Corporation developed the minicomputers	ASIMO (Advanced Step Innovative Mobility), a robot, was created by Honda Motor Co. Ltd. On December 13, 2005 in Tokyo, Japan	Use to design airplanes and missiles	Developed for atomic energy laboratory to handle a lot of data, calculate pay checks, used in businesses, universities, and government organizations
		All high-level languages like C and C++, Java, .Net etc., are used in this generation.	

GENERATION OF COMPUTERS

	FIRST GENERATION	SECOND GENERATION	THIRD GENERATION	FOURTH GENERATION	FIFTH GENERATION
TIMELINE	1940-1956	1956-1963	1964-1971	1972-2010	2010-beyond
DISTINCT CHARACTERISTIC/ INNOVATION	Use of Vacuum Tubes				
FEATURES		Smaller in size, more efficient, less energy consuming			
EXAMPLES			Minicomputers, IBM 360s, IBM 370s		
OTHER INFORMATION					VLSI technology became ULSI (Ultra Large Scale Integration) technology

ACTIVITY 3

***Directions*:** Using the diagram, write down the different *Types of Computers*. Choose your answer from the box.



Desktop model	*Supercomputer*	*PDA*	*Mainframe computer*	*Minicomputer*
Workstation	*Notebook*	*Personal computers*	*Tower model*	*Portable computer*
Hand-held computers	*Subnotebook*	*Laptop*	*Palmtop*	

REFLECTION

What gives you an implication why we need to trace the history of computer?

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REFERENCES

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La Putt, Juny P (1984). *Introduction to Computer Concepts.* Baguio Research and Publishing Center, Baguio City

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https://turbofuture.com/computers/Classification-of-Computers-by-Generation

https://www.tutorialspoint.com/computer_fundamentals/computer_fifth_generation.htm

https://www.youtube.com/watch?v=pBiVyEfZVUU

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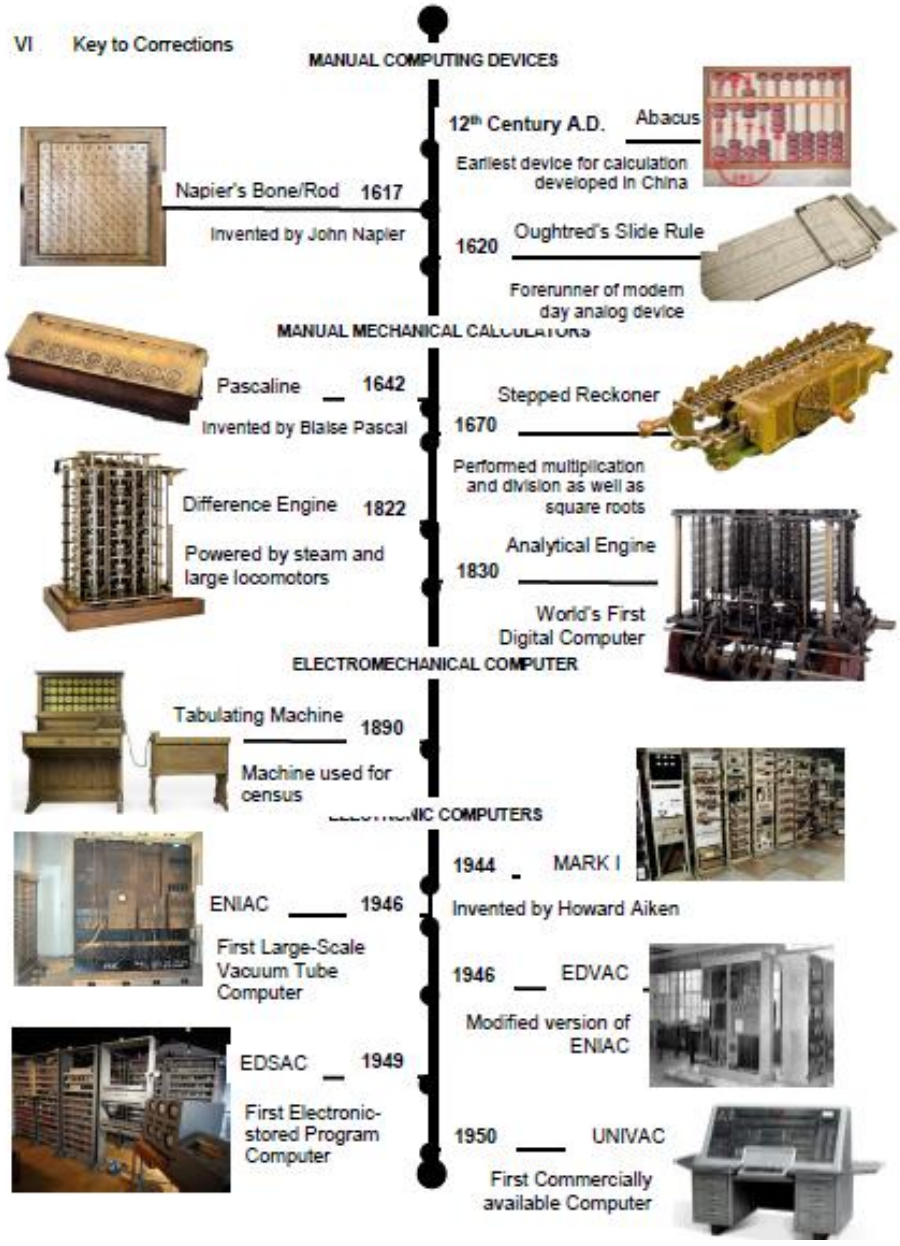
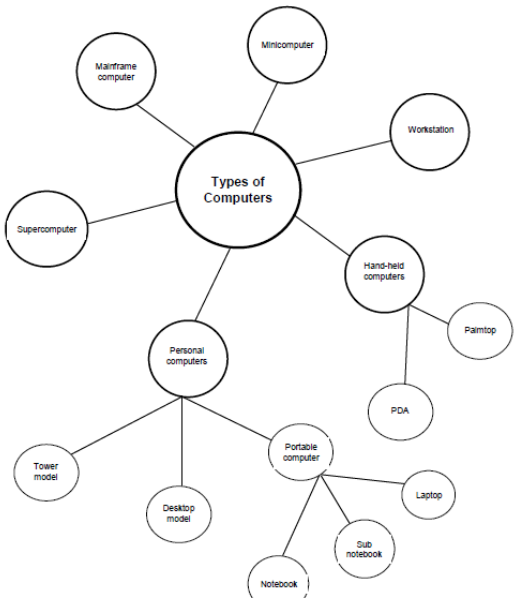
VI Key to Corrections



KEY TO CORRECTIONS

ACTIVITY NO.2



ACTIVITY NO. 1

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DISTINCT CHARACTERISTIC/ INNOVATION	Use of vacuum tubes	Transistors and diodes	Integrated circuits	Microprocessor	Artificial Intelligence
FEATURES	Huge and occupied the entire rooms, expensive to operate, lasted only for 12 hours	Smaller in size, more efficient, less energy consuming	Started to use OS, compact, reliable, less expensive	Much smaller, faster, and more powerful, multi-functional	Voice recognition emerge, can learn logic and reasoning
EXAMPLES	Z3, Colossus, Mark I, EDVAC, EDSAC UNIVAC, ENIAC	IBM 604, STRETCH, LARC, IBM 1401 (Model T), HONEYWELL400, PDP-8	Minicomputers, IBM 360s, IBM 370s	CRAY I, CRAY X-MP, CYBER 205, MITS Altair 8800, microcomputers	Desktop computers, laptops, palm computers, Pentium computers
OTHER INFORMATION	Use to design airplanes and missiles	Developed for atomic energy laboratory to handle a lot of data, calculate pay checks, used in businesses, universities, and government organizations	Digital Equipment Corporation developed the minicomputers	ASIMO (Advanced Step Innovative Mobility), a robot, was created by Honda Motor Co. Ltd. On December 13, 2005 in Tokyo, Japan	VLSI technology became ULSI (Ultra Large Scale Integration) technology All high-level languages like C and C++, Java, .Net etc., are used in this generation.