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TLE – ICT - CSS
QUARTER 2

Module 3-Week 3

DEPARTMENT OF EDUCATION

CIT

NATIONAL CAPITAL REGION
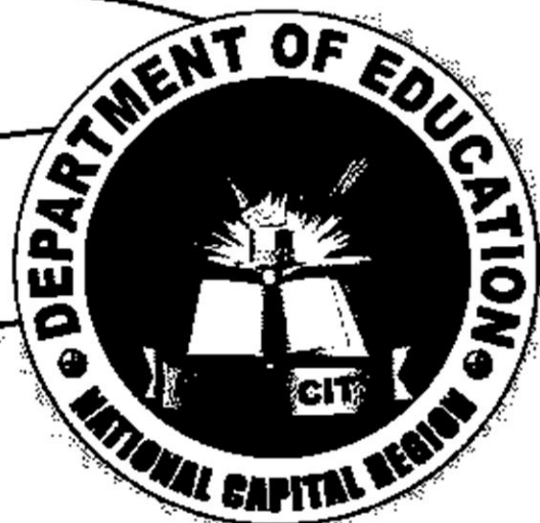
Introductory Message

MODULE 3-Q2 GRADE 9

WELCOME TO THE WORLD OF COMPUTER SYSTEM SERVICING

This module covers the two of seven (7) common competencies in Computer System Servicing which will lead you to acquire a National Certificate Level II (NC II). It contains information and suggested learning activities for you to complete. Completion of this module will help you better understand the succeeding module on setting up computer networks.

This module consists of two (2) lessons and (6) six learning outcomes. Each lesson and learning outcome contain other sub-learning outcome and learning activities supported by each instruction sheets. Before you perform the activities read the information in What's New and What is It, to ascertain yourself and your teacher that you have acquired the knowledge necessary to perform the skill required of the particular learning outcome.

The specific competency covered in this module and their schedule of recitation are as follows:

LESSON 3: PERFORMING MENSURATION AND CALCULATION (PMC)

LO 1. Select measuring instruments

LO 2. Carry out measurements and calculations

LO 3. Maintain measuring instruments

LESSON 4: PREPARING AND INTERPRETING TECHNICAL DRAWING (PITD)

LO 1. Identify different kinds of technical drawings

LO 2. Interpret technical drawings

LO 3. Prepare/make changes to electrical/electronic schematics and drawing

LO 4. Store technical drawings and equipment/instruments

Lesson 3 — Performing Mensuration and Calculation

What I Need to Know

Learning Competency: Lesson 3: Performing Mensuration and Calculation (PMC)

Learning Outcomes: LO 2. Carry out measurements and calculations

Learning Objectives:

This module contains unit of competency on "PERFORMING MENSURATION AND CALCULATION (PMC)". This covers the knowledge, skills, attitudes, and values needed in understanding concepts and underlying principles in performing measurements and calculations. At the end of this module, you are expected to:

1. Perform calculation needed to calculate storage capacity of storage media using the four mathematical fundamental operations: addition (+), subtraction (-), multiplication (x), and division (÷).
2. Use calculation involving fractions, percentage, and mixed numbers to complete workplace tasks; and
3. Self-check and correct numerical computation for accuracy.

In the previous lesson, you have learned that computer data is represented using binary, a number system that uses 0s and 1s. Some of your computer files such as software, music, documents, and any other information that is processed by a computer is also stored using binary.

What's New

Look and list down different storage media around you. Then, write its type and storage capacity as shown in the table below:

Storage Media (Ex. Memory Card, Flashdrive)	Type (Magnetic/Optical/Flash Memory)	Capacity (Example: KB,MB,GB,T)
Ex. CD-ROM	Optical	700 MB
1.		
2.		
3.		
4.		

5.		

Before deciding what kind or type of storage device you need to use, it is important to identify the requirements or specification of your data storage. When deciding on the type of device needed, you should consider cost, capacity, speed of access, portability, durability, and reliability.

From the past lesson, you learned that the binary number system uses only two symbols, 0 or 1. This is how a computer stores information and into the indicated storage device such as a hard drive.

What is It

The most common unit of digital data storage is a bit. It is also called as binary and it is considered as the standard unit in which a computer stores data. To increase the size of information stored, bits are clustered into groups of eight, which equals to a byte. This measurement process continues exponentially (8 bits = 1 byte, 1 kilobyte = 1,024 bytes, etc.).

The table below shows the unit measurement system which helps users understand the storage process of computers. Here is a basic table to illustrate how the units increase exponentially.

1 Byte (B)	8 bits
1 Kilobyte (KB)	1024 bytes
1 Megabyte (MB)	1024 KB
1 Gigabyte (GB)	1024 MB
1 Terabyte (TB)	1024 GB
1 Petabyte (PB)	1024 TB
1 Exabyte (EB)	1024 PB
1 Zettabyte (ZB)	1024 EB
1 Yottabyte (YB)	1024 ZB

As you can see, the conversions vary from a standard system such as the metric system. 1 kilobyte does not convert to 1,000 but instead 1,024 bytes. The process simplifies and allows quick calculations due to the pattern of growth (1024KB to 1024MB to 1024GB etc.).

Have you ever thought of how many files can be stored in a storage media? Here are the steps on how to calculate how many files can be stored in a storage media.

CALCULATING STORAGE CAPACITY

To calculate how much data can be stored within a certain capacity you need to understand three things:

1. The size of the data being stored.
2. The available space (capacity) for storing the data.
3. How to convert between the relevant units?

Situation #1

If the size of an average digital photograph is 8MB, how many photographs can be stored on a 32GB SD card?

1. Convert the available capacity from GB to MB by multiplying by 1024:

$$\begin{array}{rl} 32 & \text{(GB)} \\ \times\ 1024 & \text{(Megabytes)} \\ \hline = 32{,}768 & \text{(MB available storage)} \end{array}$$

2. Divide the available space by the space required for one image to find how many can be stored in total:

$$\begin{array}{rl} 32{,}768 & \text{(MB total storage)} \\ \div\ \ 8 & \text{(MB per image)} \\ \hline = 4{,}096 & \text{images} \end{array}$$

Answer: 4,096 images can be stored on a 32 GB SD card.

Situation #2

Suppose there are 140 music files, each of which is approximately 6 megabytes in size and 1 gigabyte USB memory stick on which these files are to be stored. In order to identify how much storage space is required to store all these files on the USB memory stick, the following calculation can be used:

$$\begin{array}{rl} 140 & \text{(music files)} \\ \text{x } 6 & \text{(megabytes size of each music file)} \\ \hline = 840 & \text{(megabytes size of data being stored)} \end{array}$$

To determine whether the USB memory stick has enough capacity to store all 140 music files, the units used for both the files and the storage device need to be the same. The size of the music files is in megabytes, so the capacity of the USB will also need to be converted to megabytes. In this example, the USB memory stick has a 1 gigabyte capacity.

1 gigabyte = 1024 megabytes

The capacity of the USB memory stick is now expressed in megabytes. The following calculation will determine how many 6 megabyte files this storage device can hold.

$$\begin{array}{rl} 1024 & \text{(megabytes)} \\ \div\ 6 & \text{(megabytes)} \\ \hline = 166.66 & \text{files (music files can fit to 1024 megabytes of USB memory stick)} \end{array}$$

Answer: As there are 140 music files, they will all fit on the USB memory stick.

This process can be applied to files of any types and sizes:

File type	Typical size	Quantity 1 gigabyte USB memory stick could hold
Word processed document	50 kilobytes	1 gigabyte = 1,000 megabytes, 1000 megabytes = 1,000,000 kilobytes, 1,000,000 / 50 = 20,000 word processed files
Image file	100 kilobytes	1 gigabyte = 1,000 megabytes, 1000 megabytes = 1,000,000 kilobytes, 1,000,000 / 100 = 10,000 image files
Video file	100 megabytes	1 gigabyte = 1,000 megabytes, 1,000 / 100 = 10 video files

Most files in our computer contain thousands of bytes and file sizes are often measured in kilobytes. Larger files, such as images, videos, and audio files, contain millions of bytes and are measured in megabytes. Modern storage devices can store thousands of these files, that is why storage capacity is typically measured in gigabytes or even terabytes. Being familiar on the process and how the digital unit conversion measurements help you understand sizes of storage devices.

References

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