



# Unit 2 Digital Information

2.1 Bytes and File Sizes

# Introduction

- Introduction video:
  - [https://www.youtube.com/watch?time\\_continue=3&v=HRmfXA4EUBs](https://www.youtube.com/watch?time_continue=3&v=HRmfXA4EUBs)
- How to view file properties on a Chromebook:
  - [https://www.youtube.com/watch?time\\_continue=30&v=oUjffo57XXE](https://www.youtube.com/watch?time_continue=30&v=oUjffo57XXE)

# Terminology

- As we embark on a new unit about Data and Digital Information, we need to get familiar with terminology about data and different types of data files
- **Bit**—binary digit; each binary element
- **Byte**—8 bits; standard fundamental unit (chunk size) underlying most computer systems today.
  - Megabyte
  - Kilobyte
  - Gigabyte
- Why is a BYTE made up of 8 bits?
  - Computers used different “byte sizes” throughout history.
  - Since so much of computing relies on instructions and data encoded in ASCII (where each character is 8 bits), 8 bits became the common size to use.
  - The word BYTE may have come from IBM in which their computers could process or “bite” 8 bits at a time...then they changed the spelling to avoid confusion with bit.
- Most computers only let you save data as a combination of whole bytes, even if you only want to store 1 bit of info, you have to use a whole byte.

## Recall...

- From Unit 1 when we looked at a plain text (WordPad) document to see that each character we typed was saved as a single byte.
- But then we learned that the FORMAT of the information (so that the text displayed correctly) took up even MORE bytes
- How many extra bytes are needed to store all of this “extra” information like formatting?

## Making a Prediction

- If “hello” would take up 5 bytes of storage in WordPad...

*how many bytes would a Word document require to store the same text?*

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21,969 bytes due to the extensive  
formatting information

# Bytes and File Size Activity

- Use the provided websites to complete some research on the conversions of the different number of bytes and the size of various type of files.

# Wrap Up

Number	# of bytes (approx.)	Conversion to previous size
1 Byte	1	8 bits
1 Kilobyte (KB)	1 thousand	1,000 bytes
1 Megabyte (MB)	1 million	1,000 KB
1 Gigabyte (GB)	1 billion	1,000 MB
1 Terabyte (TB)	1 trillion	1,000 GB
1 Petabyte (PB)	1 quadrillion	1,000 TB
1 Exabyte (EB)	1 quintillion	1,000 PB

## Wrap-Up Continued

- As you probably saw, there are some discrepancies in the use of the prefixes:
  - Ex. Kilobyte is really 1024 bytes but often rounded to 1000 bytes
  - Ex. Megabyte is really 1,048,576 bytes but often rounded to 1 million (only 5% difference)
- There are other terms (kibibyte, mebibyte, gibibyte, etc.) but they have not caught on
- Think of it as a little “wiggle room”.

*In this class, an approximation is sufficient*

# What do I need to know?

- Exact calculations are not as important as being familiar with the terminology and approximate sizes.
- Modern data files (.docx, .pdf, .jpeg, .gif, .mp3) typically measure in the thousands, millions, billions, or trillions of bytes)
- Realize that files are made up of a LOT of bytes, which may cause problems when transmitting over the internet (preview for tomorrow)

# Homework

- Finish Activity Guide