Name(s)_____ Period _____ Date _____

Activity Guide - Bytes and File Sizes

What is a byte? A byte is a unit of data that is 8 bits long. A byte is the standard "chunk size" for binary information in most modern computers

Larger Chunks of Data: On modern computers the amount of information we can create and store has grown so large that we need new units of measurement to describe the size of our data. Use these websites for your research.

- **Stanford University - CS 101 - Kilobytes Megabytes Gigabytes**
- **Computer Hope - How much is 1 byte, kilobyte, megabyte, gigabyte, etc.?**
  http://www.computerhope.com/issues/chspace.htm

Unit	Number of Bytes (approx)	Example of File Type or Data Measured in this Unit
Kilobyte (KB)		
Megabyte (MB)		
Gigabyte (GB)		
Terabyte (TB)		
Petabyte (PB)		
Exabyte (EB)		

How big are the files I use every day? Try to determine the size of files you probably use every day. You can either research these answers online or check the size of actual files on your computer.
- PC/WINDOWS: Right-click and choose "Properties"
- MAC: Ctrl+click and choose "Get Info"

File type	Size as # of pages, minutes, seconds, or dimensions	Size of file in Bytes, KB, MB, GB, etc.
page of plain text (.txt)	About 500 words, or 2500 characters	2500 Bytes, 2.5KB
.jpg image		
animated .gif image		
.pdf file		
Audio file as .mp3		
movie file such as .mov or .mp4		

Test your knowledge!

The first 3 questions here are from: [Stanford University - CS101](#)
You can check the answers there.

1. Alice has 600 MB of data. Bob has 2000 MB of data. Will it all fit on Alice's 4 GB thumb drive?

2. Alice has 100 small images, each of which is 500 KB. How much space do they take up overall in MB?

3. Your ghost hunting group is recording the sound inside a haunted classroom for 20 hours as MP3 audio files. About how much data will that be, expressed in GB?

Here are a few more.

1. A salesperson is trying to sell you a phone that has 16 GB of memory saying, "that's enough space to record an hour of high quality video!" This salesperson is probably wrong, but in which direction? Would you have more than enough memory or not enough?

2. Shakespeare's complete works have approximately 3.5 million characters. Which is bigger in file size: Shakespeare's complete works stored in plain ASCII text or a 4 minute song on mp3? How much bigger?

3. **Tricky**: Assume your Internet connection can transmit 1 million **bits** per second. Approximately how long would it take you to download 1 Terabyte of data? (Hint: first figure out how many bits a terabyte is, second be prepared to wait a long time).