**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_**

We’ve learned that all computer devices (i.e. cell phones, game consoles, tablets & PC's) store their information digitally in binary – a numerical system with only two states, which we generally think of as a sequence of ‘0’s and ‘1’s.

In this webquest, you’ll use some websites as well as your favorite search engine to answer a series of questions related to digital data storage and representation. You should come away with a better understanding of how information is used by our devices.  Write your answers below or save them in a Word file on the computer in our Classroom Shared folder.

**A. Data Storage:**

1. To represent the number 5634, how many bits do I need? (try search for ‘5634 in binary’ using Google - each position in a binary number is one "bit")

\_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ **How many Bit positions? \_\_\_\_\_\_\_\_**

2. The largest harddrives currently on the market have a capacity of [approaching 60 terabytes](http://news.cnet.com/8301-21546_3-57400009-10253464/seagate-reaches-1tb-per-square-inch-hard-drive-to-reach-60tb-capacity/) .  **How many bits are in one terabyte?** (Remember: 8 bits are in 1 byte - that might be on a test some day.)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Bytes in 1 TeraByte **X** 8 Bits in 1 Byte = \_\_\_\_\_\_\_\_\_\_\_\_\_

3. **Roughly how many MP3s can be stored in a Terabyte of space? How many hours of music is this?**  
      NOTE: An MP3 has about 1 megabyte (MB) per minute (according to [eHow](http://www.ehow.com/facts_6920313_typical-mp3-file-size.html) ).

\_\_\_\_\_\_\_\_\_\_\_\_ Megabytes in a Terabyte **X** 1 Minute MP3 **X** 1 Hour **=** **\_\_\_\_\_\_\_\_\_\_\_\_ Hours.**   
 1 MegaByte 60 Minutes

4. **How are the bits (1's and 0's) encoded on a CD?** Hint: check out [how CDs work](http://express.howstuffworks.com/express-cd.htm).  Please write /draw your explanation in your own words – do not just copy - thanks.

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**B. Digital images**

1. As we discussed, colors in digital pictures are represented numerically. Designers and web developers often describe colors in hexadecimal. **What is hexadecimal and how is it related to binary?** Why do you think that they use Hexadecimal instead of Binary numbers?
2. Use [a color chart](http://www.allprofitallfree.com/color-wheel2.html) (<http://www.allprofitallfree.com/color-wheel2.html> ) and **write how your favorite color is represented both in hexadecimal** (HTML code) **AND in decimal** (three values for red, green and blue).

**Your Color:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**HTML Code** (in Hexadecimal) : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Decimal Color Values:** Red: \_\_\_\_\_\_\_

Green: \_\_\_\_\_\_\_

Blue: \_\_\_\_\_\_\_

1. Search to find **what is "lossless" compression and give two examples** of common image formats that are lossless.
2. Search to find **what is what is "lossy" compression? and give determine what common image file format** is lossy?

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