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| **Date Assigned:** 8/29/17 | **Date Due:** 8/31/17 |
| **Unit:** Basics | **Turn In List:** **1. Terms (this file)** |
| *“I will demonstrate an understanding of digital information and convert decimal, binary and hexadecimal.”* | |

**Computer Basics: Bits, Bytes and Basics**

**Content Objectives:** Students will use a modern OS to examine how information is stored and examine/convert values between the decimal, binary and hex number systems.

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| **Starter Activity** |
| Using Processing and the online reference, create the following sketch. You do not need to draw gridlines and number labels. Don’t worry about getting the dimensions absolutely perfect; rather match shape attributes and fill colors for each. HINT: you will be using rect() ellipse() triangle() and quad() functions.  Macintosh HD:Users:kappter:Desktop:Screen Shot 2013-09-03 at 5.53.59 PM.png |

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| **Use the internet to find definitions to these Key Terms:** | |
| OS | An operating system that controls the hardware and software resources, all computers need this to operate |
| Kernel | This is the main component of the OS and it takes the CPU, Memory, and devices and turns them into applications |
| Binary | Using 1’s and 0’s this is what stores the data and performs the calculation on the computer |
| Bit and Bit Systems | A bit is the smallest unit of data in a computer, and a bit system stores data and executes instructions to bits |
| Byte | Eight bits coming together |
| Kilo, Mega, Giga, Tera | These are all very similar because they all are used to show the quantity of something, although they are different sizes |
| Hexadecimal | A system that uses a numerical notation of 16 rather than 10 |
| Base 2, 8, 10, 16 | Each of these different bases have different uses of digits and decimals that work differently to get an answer |
| File and File Extension | A file is what holds your work or whatever you put into it, and a file extension is the last part of your file name like .pdf or something similar, typically 3 letters long like the one above |
| Folder/Directory | A directory organizes the folders into a hierarchical structure keeping all the information |
| Path | Typically the name of a file or directory and gives the location |

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| **Application Terms:** | |
| Windows Explorer or Finder | Both are graphical user interfaces used to quickly access file systems, but windows explorer (Now known as File Explorer) is Windows, while Finder is Apple |
| File Attributes - Properties or Get Info | This application is what gets or sets the attributes for the file or directory |
| Size Attributes | This application is what specifies the visible width in characters of an input element |
| Created, Modified and Other File Attributes | Created, modified, and other file attributes are what show the time a file was created, what time it was last modified, and what time it could’ve been last accessed or other |
| File Compression | When a file is reduced to save disk space for an easier and faster transmission over a network or the Internet |

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| **Assignment:** |
| Basic:   1. Students will demonstrate that they can navigate to the “Desktop” directory of their computer by typing the full path (Windows will include the drive letter): 2. Students will then create (or verify) the following folders inside the new “Computer Programming” directory, “Semester1” and paste the path here: 3. Students will fill in the blanks in the following table (all binary results will be written in 8 bits). Use the [Binary tool](https://dl.dropboxusercontent.com/u/21278437/LearningPJS/Teacher38LearningBinarySmall/index.html) for assistance:  |  |  |  | | --- | --- | --- | | **Binary** | **Decimal** | **Hexadecimal** | | 01010101 | 85 | 55 | | 10100010 | 162 | A2 | | 11010100 | 212 | D4 | | 00111010 | 58 | 3A | | 01000100 | 68 | 44 | | 11110010 | 242 | F2 | | 11110111 | 247 | F7 |  1. Using the [ASCII table](http://www.asciitable.com), write your first and last name in binary, decimal and hex:   Binary Name: 01001010,01100001,01111000,01101111,01101110 01000100,01110010,01101001,01110110,01110010  Decimal Name: 74,97,120,111,110 68,114,105,118,114  Hex Name: 4A,61,78,6F,6E 44,72,69,76,65,72   1. Create a Processing sketch meeting the following requirements and paste code below:    1. Draw an ellipse that follows mouseX and mouseY    2. Show the path as the mouse moves    3. Randomize one of the color hues    4. Randomize the size as it is dragged |
| // setup runs once  void setup() {  size(600,600);  background(255,255,255);  frameRate(200);  }  // draw runs on a loop  void draw() {  //background(255,255,255);  //line(0,0,mouseX,mouseY);  fill(203,164,random(203));  ellipse(mouseX,mouseY,random(30,55),random(30,55));  } |

Notes (Points of interest, mistakes, lessons learned, web resources, and thoughts):

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