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| **Date Assigned:** 9/1/15 | **Date Due:** 9/3/15 |
| **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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| **Key Terms:** | |
| OS | Operating system (Windows, Mac, Linux) |
| Kernel | Portion of OS monitoring stream of information coming in and out |
| Binary | Base 2. Counting system using 1’s and 0’s |
| Bit and Bit Systems | Smallest unit of digital information. |
| Byte | 8 Bits |
| Kilo, Mega, Giga, Tera | Kilo=1024, Mega=2048, Giga=3072, Tera=4096 |
| Hexadecimal | Counting 0-9 then A-F. FF always means 250 |
| Base 2, 8, 10, 16 | Binary, Octal, Decimal, Hexadecimal. |
| File and File Extension | Critical properties of a file. |
| Folder/Directory | Contains other files, folders, cannot be attached unless zipped |
| Path | How to locate files. Drive letter, colon, backslash. |

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| **Application Terms:** | |
| Windows Explorer or Finder | File folder browsing applications. |
| File Attributes - Properties or Get Info | Shows information about your files |
| Size Attributes | File size in bytes |
| Created, Modified and Other File Attributes | More information about file without opening file. |
| File Compression | R. click, compress(Mac) R. click, send to compressed (Zipped) folder. (Windows) |

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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 | | 1000100 | 68 | 4A | | 11110010 | 242 | F2 | | 11110111 | 247 | F2 |  1. Using the [ASCII table](http://www.asciitable.com), write your first and last name in binary, decimal and hex:   Binary Name:  Decimal Name:  Hex Name:   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 |
| void setup() {  size(1500,800);  background(0);  }  void draw() {  fill(255,50,50,50);  ellipse(mouseX,mouseY,50,50);  } |

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

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