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| **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 | Operating System (ex: Windows 10 Pro 64bit, Mac OS 10.13.6 [High Sierra], Ubuntu Linux, iOS, Android, etc.) |
| Kernel | Heart of the OS |
| Binary | Base 2 system consisting of 0 and 1 |
| Bit and Bit Systems | Number of bits read by the OS |
| Byte | Exactly 8 bits of digital information |
| Kilo, Mega, Giga, Tera | Kilo is 1,000 bytes, Mega is 1,000,000 bytes, Giga is 1,000,000,000 bytes, Tera is 1,000,000,000,000 |
| Hexadecimal | Base 16 system using 0-9 and A-F |
| Base 2, 8, 10, 16 | Base 2 is Binary, Base 8 is Octal, Base 10 is Decimal, Base 16 is Hexadecimal |
| File and File Extension | Cannot be the same name and extension in a folder. Separated by a period |
| Folder/Directory | Organizational unit on an OS |
| Path | Precise location of a file on an OS |

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| **Application Terms:** | |
| Windows Explorer or Finder | File manager |
| File Attributes - Properties or Get Info | Meta data |
| Size Attributes | Always measured in bytes |
| Created, Modified and Other File Attributes | System information |
| File Compression | .zip file, just makes it easier to send. |

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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: 01000100 01100101 01110110  Decimal Name: 68 101 118  Hex Name: 44 65 76   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(300,300);  }  void draw () {  fill(random(255),random(255),random(255));  ellipse(mouseX,mouseY,random(20),random(20));  } |

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

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| <https://processing.org/reference/setup_.html>  <https://processing.org/reference/curlybraces.html>  <https://processing.org/reference/draw_.html>  <https://processing.org/reference/void.html>  I couldn’t get one single colored ellipse to follow the cursor while also generating a trail of color changing ellipses in the time given. Also, I couldn’t find any sources to find out how to make line follow the cursor to act as a trail. |