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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 OSX, Ubuntu Linux, iOS, Android, |
| Kernel | The foundational layer of an operating system. It functions at a basic level and communicates with hardware and managing resources, like RAM and the CPU (heart of the OS) |
| Binary | Base 2 system consisting of 0’s and 1’s (off and on) |
| Bit and Bit Systems | Number of bits read by the OS (at max) |
| Byte | 8 bits of digital information |
| Kilo, Mega, Giga, Tera | Kilo is 1000 bytes, Mega is 1,000,000 bytes, Giga is 1,000,000,000 bytes, Tera is 1,000,000,000,000 bytes (not exactly accurate) |
| Hexadecimal | Base 16 system using 0-9 and A-F |
| Base 2, 8, 10, 16 | Base 2: Binary, Base 8: Octal, Base 10: Decimal, Base 16: Hexadecimal |
| File and File Extension | There can’t be the same name and extension in a folder. Separated by a period. |
| Folder/Directory | An organizational unit on an OS acting as a location |
| Path | The precise location of a file on an OS |

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| **Application Terms:** | |
| Windows Explorer or Finder | The file manager |
| File Attributes - Properties or Get Info | Right clicking on a file to reveal it’s meta data |
| Size Attributes | Always measured in bytes |
| Created, Modified and Other File Attributes | System information |
| File Compression | “zips” the a folder for easy file management |

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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 | |  | 212 | D4 | | 00111010 |  |  | |  | 68 |  | |  |  | F2 | | 11110111 |  |  |  1. Using the [ASCII table](http://www.asciitable.com), write your first and last name in binary, decimal and hex:   Binary Name:  Decimal Name: 74  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 |
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Notes (Points of interest, mistakes, lessons learned, web resources, and thoughts):

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