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| **Date Assigned: 1/5/16** | **Date Due: 1/7/16** |
| **Unit:** Languages | **Turn In List:** **1. Terms** |
| *“I will be able to declare the language of focus for Semester 2 .”* | |

**Computer Programming Languages: An in-depth analysis**

**Content Objectives:** Students will research each of the five languages acceptable for the 2A computer programming state CTE certification. The following [Wiki article](http://en.wikipedia.org/wiki/Comparison_of_programming_languages) may help in your search. [Language popularity article](http://en.wikipedia.org/wiki/Measuring_programming_language_popularity).

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| **Starter Activity** |
| Write a class that will run in Processing. You may choose from the following list of class names: Human, Cat, Dog, Spaceship, Soldier or Planet. The class must contain a name, at least 2 class variables, 1 constructor, a display function and at least one action function. Paste code below:  class Ship {  color c;  float x;  float y;  float speed;  float left;  Ship(color tempC, float tempX, float tempY, float tempSpeed) {  c = color(tempC);  x = tempX;  y = tempY;  speed = tempSpeed;  left = random(2);  }  void display() {  fill(c);  ellipse(x, y, 30, 10);  fill(0);  strokeWeight(2);  line(x-15, y+2, x-20, y+4);  line(x-15, y-2, x-20, y-4);  }  void fly() {  if (left <=1) {  x += speed;  if (x > width) {  x = 0;  }  } else {  x -= speed;  if (x < 0) {  x = width;  }  }  }  } |

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| **Key Terms: (lookup each language and write a short description of each)** | |
| **C++** | It has imperative, object-oriented and generic programming features, while also providing facilities for low-level memory manipulation. It was designed with a bias toward system programming. |
| **C#** | Multi-paradigm programming language encompassing strong typing, imperative, declarative, functional, generic, object-oriented (class-based), and component-oriented programming disciplines. |
| **Java** | General-purpose computer programming language that is concurrent, class-based, object-oriented, and specifically designed to have as few implementation dependencies as possible. Compiled Java code can run on all platforms that support Java without the need for recompilation. |
| **Python** | General-purpose, high-level programming language. Syntax allows programmers to express concepts in fewer lines of code than would be possible in other languages. |
| **Visual Basic** | Event-driven programming language. Enables the rapid application development (RAD) of graphical user interface (GUI) applications, access to databases using Data Access Objects, Remote Data Objects, or ActiveX Data Objects, and creation of ActiveX controls and objects. |
| Type Safety | The extent to which a programming language discourages or prevents type errors. |
| Interpreted | Language for which most of its implementations execute instructions directly, without previously compiling a program into machine-language instructions. |
| Procedural | Based upon the concept of the procedure call. Procedures, also known as routines, subroutines, or functions simply contain a series of computational steps to be carried out. |
| Compiled | Language whose implementations are typically compilers (translators that generate machine code from source code), and not interpreters (step-by-step executors of source code). |

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|  | **C++** | **C#** | **Java** | **Python** | **Visual Basic** |
| Intended Use | Games, office applications, graphics and video editors, and operating systems. | The best GUI frameworks for Windows applications. | Commercial e-commerce website, android apps, scientific, financial, games, | True general purpose language. | Lets you create standalone executable programs (EXE files). |
| Strongly Typed | No | Yes | Yes | Yes | Both |
| OS’s | Windows, Mac OS, Linux | Windows | Windows, Mac OS, Linux | Windows, Mac OS, Linux | Windows |
| Industry | Securities, Wireless telecoms | .NET development | Business applications | Apparel, Aviation, Business, Insurance | .NET development, Laboratory Automation |
| **Atoms or Bits** | Atoms | Bits | Bits | Both | Bits |
| Current Version | ISO/IEC 14882:2014 | C# 6.0 | Java SE 8 | Python 3.5.1 | Visual Basic 10 |
| Official Standard | https://isocpp.org/std/the-standard | https://msdn.microsoft.com/en-us/library/ff926074.aspx | http://www.oracle.com/technetwork/java/codeconvtoc-136057.html | https://www.python.org/doc/ | https://msdn.microsoft.com/en-us/library/b4z62wxz(v=vs.90).aspx |

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| **History and Background of the Language you are interested in:** |
| You may work in pairs for this portion but you need to submit your own file to Canvas. Give the When’s, Who’s, Why’s, Where’s, How’s and worldwide popularity pulse applicable for the language you are considering. (Note, this is NOT your final decision.)  When: June 1991  Who: James Gosling, Mike Sheridan, and Patrick Naughton  Why: Designed for interactive television.  Where: United States  How: Used c-like syntax  Java is the most popular programming language in the world. |

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| **Assignment:** |
| Rewrite Class from Starter:  Find the official standard website or simply do a google search for your language and “class” or “object” and do your best to re-write the class from starter in the new language (code not require to build or compile.)  class Ship {  color c;  float x;  float y;  float speed;  float left;  Ship(color tempC, float tempX, float tempY, float tempSpeed) {  c = color(tempC);  x = tempX;  y = tempY;  speed = tempSpeed;  left = random(2);  }  void display() {  fill(c);  ellipse(x, y, 30, 10);  fill(0);  strokeWeight(2);  line(x-15, y+2, x-20, y+4);  line(x-15, y-2, x-20, y-4);  }  void fly() {  if (left <=1) {  x += speed;  if (x > width) {  x = 0;  }  } else {  x -= speed;  if (x < 0) {  x = width;  }  }  }  } |

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

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