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| **Date Assigned: 12/1/16** | **Date Due: 12/5/16** |
| **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:  Spaceship s1;  void setup() {  size(900, 900);  background(0);  s1 = new Spaceship();  }  void draw() {  background(0);  s1.display();  s1.fly();  }  class Spaceship {  // member variables  float x, y, xspeed, yspeed;  // constructor  Spaceship() {  x = 450;  y = 600;  xspeed = 6;  yspeed = 3;  }  // member methods  void display() {  fill(200);  stroke(100);  triangle(x-50, y+40, x-10, y+10, x-10, y-40);  triangle(x+50, y+40, x+10, y+10, x+10, y-40);  triangle(x-10, y+30, x+10, y+30, x, y-30);  fill(255, 175, 0);  stroke(0);  quad(x-20, y-5, x-15, y-15, x-5, y+10, x-5, y+40);  quad(x+20, y-5, x+15, y-15, x+5, y+10, x+5, y+40);  triangle(x-50, y+30, x-15, y+5, x-15, y);  triangle(x+50, y+30, x+15, y+5, x+15, y);  fill(50);  stroke(255);  ellipse(x, y, 5, 30);  fill(50);  stroke(100);  rect(x-10, y-35, 5, -5);  rect(x+10, y-35, -5, -5);  rect(x-10, y-35, 3, -20);  rect(x+10, y-35, -3, -20);  }  void fly() {  x = mouseX;  y = mouseY;  }    void flyUp() {  y-=yspeed;  }  void flyRight() {  x+=xspeed;  }  void flyDown() {  y+=yspeed;  }  void flyLeft() {  x-=xspeed;  }  } |

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| **Key Terms: (lookup each language and write a short description of each)** | |
| **C++** | C++ is an object oriented programming (OOP) language. In certain scenarios, it can be coded in either way and is an example of a hybrid language. |
| **C#** | A program-oriented programming language from Microsoft. C# is based on C++ and contains features similar to those of Java. |
| **Java** | Java is a general-purpose computer programming and is specifically designed to have as few “implementation dependencies” as possible. |
| **Python** | Python is a widely used high-level, general-purpose, interpreted, dynamic programming language. Its syntax allows programmers to express concepts in fewer lines of code than possible in languages such as C++ or Java. |
| **Visual Basic** | It’s a programming environment from Microsoft where programmer uses a graphical interface to modify preselected sections of code written in the BASIC programming language |
| Type Safety | How languages use and convert data types |
| Interpreted | Requires the presence of an interpreter on your computer |
| Procedural | Follows the order of top-down instructions |
| Compiled | Source code being turned into machine code. Running source code through a compiler. |

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|  | **C++** | **C#** | **Java** | **Python** | **Visual Basic** |
| Intended Use | Controlling Hardware | Controlling Software | Controlling Software | Controlling Software | Controlling Software |
| Strongly Typed | Yes | No | Yes | Yes (dynamically) | Yes and No |
| OS’s | All of them | Windows | All of them | The web | Windows |
| Industry | Software development |  |  |  |  |
| **Atoms or Bits** | Both | Atoms | Both | Bits | Bits |
| Current Version | C++14 | C# 6.0 | Java 8.11 | Python 3.5.2 | VB 10 |
| Official Standard (Documentation or Website) | cplusplus.com | msdn.com | oracle.com | Python.org | msdn.com |

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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.) |

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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 Spaceship {  // member variables  float x, y, xspeed, yspeed;  public:  void set\_values (float, float);  float area (void);  } fill(200);  stroke(100);  triangle(x-50, y+40, x-10, y+10, x-10, y-40);  triangle(x+50, y+40, x+10, y+10, x+10, y-40);  triangle(x-10, y+30, x+10, y+30, x, y-30);  fill(255, 175, 0);  stroke(0);  quad(x-20, y-5, x-15, y-15, x-5, y+10, x-5, y+40);  quad(x+20, y-5, x+15, y-15, x+5, y+10, x+5, y+40);  triangle(x-50, y+30, x-15, y+5, x-15, y);  triangle(x+50, y+30, x+15, y+5, x+15, y);  fill(50);  stroke(255);  ellipse(x, y, 5, 30);  fill(50);  stroke(100);  rect(x-10, y-35, 5, -5);  rect(x+10, y-35, -5, -5);  rect(x-10, y-35, 3, -20);  rect(x+10, y-35, -3, -20);  int main() {  Spaceship rect;  Rect.set\_values (3,4);  count<< “area: “ << rect.area();  return 0;  }  x = 450;  y = 600;  xspeed = 6;  yspeed = 3;  }  void fly() {  x = mouseX;  y = mouseY;  }    void flyUp() {  y-=yspeed;  }  void flyRight() {  x+=xspeed;  }  void flyDown() {  y+=yspeed;  }  void flyLeft() {  x-=xspeed;  }  } |

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

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