Questions from the Skills Inventory:

19. What's the difference between a for loop and a while loop?
A for loop runs whilst knowing the amount of increments while a while loop does not.
I.e. a for loop will know to generate 10 ellipses but a while loop generates ellipses based on if the int's value is less than a value set.

22. What's the difference between parameters and arguments?
Parameters refer to the data needed to use a function for example, rect() uses 4 parameters, x,y,w,h and the arguments refer to the data itself; for example, when drawing a rectangle, the values rect**(500,800,90,10)**; are the arguments sent to the program to create such shape.

25. What's the difference between a class and an object?
A class is a section of the code that contains the attributes and functionality of objects.
I.e. in my Andy class (encapsulates her movement, mechanics, etc.), and her movement defined as "new Andy" on the main sketch would be the object; the display of what the class is defining.

26. What is a constructor function? What does it do and when?
A constructor are the attributes that initialize an object when it is first generated for example: in my code, the bullet class contains a Bullet object, in this object, the constructor be this line:

```
public Bullet(float x, float y, PVector d) {
```

As it initializes the bullet's x and y coordinates when first spawned, it also checks whether the bullet is active and initializes the direction given the PVector in the code.

27. Why should each class have its own tab in Processing?
Each class should have its own tab to encourage object-oriented coding, and to keep things organized as the code becomes more complex. This also improves the readability of the coe, and is efficient when debugging because you can edit one part of the code without interfering with all of it.

31. What's the difference between an array and an ArrayList?
An array is a list of primitive types, and have a fixed value when first initialized, an example of an Array in my code is the method used to store the character sprites:

```
for(int i = 0; i < andySprites.length; i++) { //load the image based on the png file name
andySprites[i] = loadImage("Sprites/ANDY0"+i+".png");
```

whilst an ArrayList is similar, but is better equipped to add and remove things from a code, as well as resizing aspects while the code is running.

32. Why would you want to go through a list backwards, decrementing the index?
In the sense of creating a game, decrementing the index could be beneficial when animating a sprite, having an array cycle through the different frames, incrementing and decrementing helps with making the animation cycle back and forth.

37. When should you use PVector instead of float variables?
PVectors have built in attributes that allow you to simplify your code and make it more readable as opposed to floats. Floats will have you manually type out each argument under primitive types whilst a PVector better handles physics and movement
I.e.

```
 void shoot() {
    PVector aim = new PVector(0, 0);

    if(andyPos == andyBack) aim = new PVector(0, -1);
    if(andyPos == andyLeft) aim = new PVector(-1, 0);
    if(andyPos == andyFront) aim = new PVector(0, 1);
    if(andyPos == andyRight) aim = new PVector(1, 0);
```

PVector makes the speed of the bullets simpler, as opposed to writing a primitive for each coordinate and each direction.

42. What is a normalized vector, why is it useful?
A normalized vector is a vector with a magnitude equal to 1, all whilst retaining its position. This is useful for when you care more about the direction that an object is going in without having to deal with the speed

For example, a vector that is not normalized may appear to change in speed when it's movements are based on when the mouse is located, a normalized vector will retain its speed regardless of where the mouse is place on the screen