Inventory Questions

31. What's the difference between an array and an ArrayList?

An array is a way of storing a set list of data or objects, while an arraylist only stores objects but can be easily resized. Arrays are simpler and faster for the computer to use, while the dynamic process of resizing that arraylists do takes more processing power.

32. Why would you want to go through a list backwards, decrementing the index?

If the code is calling for a decrease in objects or something such as a countdown, going backwards through the list would be very helpful in that as it can decrease while still storing the items in the list.

37. When should you use PVector instead of float variables?

PVector has the ability to store information from at least two different sources, whereas float only holds a singular point of data. PVector is very useful when using more advanced operations that involve using physics or acceleration, as they make it simpler to recall information between two different points.

42. What is a normalized vector, why is it useful?

A normalized vector is when you take a pre-established vector and translate its length/distance into a unit of 1, keeping the angle/magnitude the same and using it as a way to reuse that magnitude in later parts of the code. It's similar to making small definitions or a key for words, as normalizing simplifies the info of the vector into a consistent length of 1. Taking a larger vector and normalizing it will make it shorter (same angle just with a length of one), while a smaller vector will extend to match the length of one (such as a vector that's 0.87 in distance stretching to match the unit normal of 1.00, keeping the important info of the angle).

What's the difference between a for loop and a while loop?

A loop is a bit of code that will execute a command only when the conditions are correct for a predetermined amount of time, such as this example:

"for(userVariable <= 5){
x++;
}"

The variable x will increase by 1 until userVariable is greater than or equal to 5.

A while loop is the same thing as a for loop, except it operates with boolean conditionals instead of values that it must meet, executing the loop for as long at the conditional statement is correct, example:

"while(userVariable == true){
x++;
}"

The variable x will increase by 1 for as long as the userVariable remains true.

22. What's the difference between parameters and arguments?

Parameters define what types of arguments a constructor function will accept, such as the user defined function paper() taking the arguments (x, y, z), looking like paper(x,y,z). Parameters basically make a space to take in the necessary information that the function will then use in the code that's within it, like declaring the local variables. Arguments are true values of when you actually fill in (x, y, z), such as putting in paper(1, 2, 3).

25. What's the difference between a class and an object?
A class is a way of separating a chunk of code into a reusable part, while an object is an instance of the information within that class being used in the main part of the code (or just the code within the class itself). The class is just a way of organizing this info, such as one would organize sections of a digital drawing into a folder with layers in it.

26. What is a constructor function? What does it do and when?
A constructor function is the area in which you put temporary arguments in, where you will then pass the real arguments through later. When making an instance of an object, the constructor function is where you put in the parameters to decide the differences in each instance, such as toyBall = new Toy (parameter, parameter, parameter).

27. Why should each class have its own tab in Processing?
For one, it makes more sense for a separated element of the program to have its own separate page, but it also allows for an easier viewing experience. If I were to be working in a team, being able to easily view and switch between classes would be indispensable to the workflow of the project.

Plan for inventory

Shapes:
1. Rect to create shapes in the background and foreground
2. fill, and noStroke to fit visual style and remove the outlines around the shapes
3. shapeMode CENTER will be used for the character's model, and shapeMode CORNER will be used for all other shapes

System:
4. setup(), draw() will of course be used to create and run the entire game, calling all the objects and necessary functions to draw
5. background() will be used to make a light blue background, and random() will be used to vary the food particles positions
6. constrain() will be used to keep shapes at a certain size, and the score from exceeding 0 and 100
7. keyPressed() and keyReleased() will be used to create player actions with WASD
8. Use of increment operators (++, +=, --, -=, *=, /=) will be for the moving player with WASD, moving the backgrounds, and moving the spear
9. I will declare and use a local variable for the different classes, such as the variables used for the spear's speed
10. I will declare and use a global variable, as there will be variables that are tied to each other across classes such as the score

Debugging:

11. println() will be used to print the location of the character and spear in case it goes off screen

Control Flow:

12. The conditional statements: if, else if, else will be used for the restart and start buttons
13. I will use almost all of the boolean expressions ==, >=, <=, as I will have them check for collision and mouse interaction in conditional statements
14. The logical operator && and || will be used to create collision detection with the character model and
15. switch statement will be used to switch the various dialogue options from other fish, and/or game states (possibly an array)

Loops

16. I will use for loops and a while loops in the timer and the start and end screens
17. A nested loop will likely contain the majority of loops used, as well as used when pressing space to get the next fish dialogue
18. break() will be used as a way to differentiate the dialogue, as there will be a drawing of the fish's head in the bottom left that can talk

Functions

20. I will declare & call a function with no parameters and no return type for shapes in the foreground and effects
21. I will declare & call a function with a return type in the global variables used, as well as the score
23. Pass by copy (value): declare and use a function that takes int, float, char, etc as an argument – this will likely be used when deciding if the dialogue has reached the end, and is time to loop
24. Pass by reference (objects): declare and use a function that takes an object as an argument –I will likely use this when counting the amount of food the fish has interacted within the array of food

Classes/objects

28. I will write a class with a constructor function when I make all of the classes, such as fish, food, and spear
29. I will use the keyword new to instantiate all the objects I will be using in the project, such as the fish
30. I will write a constructor function with parameters within one of the three classes; fish, spear, or food

Lists

33. I will Initialize and populate an array when creating the food particles
34. I will Initialize and populate an ArrayList as I make background fish
35. I will use an ArrayList to manage all the background fish and randomize their positions
36. I will use an ArrayList method: remove() as the fish in the background slowly disappear over the course of 3 minutes

Vectors

38. I will use the PVector class in the spear, as well as the other objects that call for it to be utilized

39. Do some basic physics: use position, velocity, and acceleration vectors – I will likely use position when tracking the fish to the spear
40. I will find the direction and distance between two points; the fish and the spear
41. the random 2D vector will likely be the particles for the food, but might also be used in the background

Nice to Know (optional)

44. I will use a timer of 20 seconds, and game over will be announced after it finishes counting down
46. Make a button or toggle switch with a roll-over highlight (color or size change) – the retry button and start button will have this effect
48. Do animation with images (spritesheet or individual files)—the background will likely have animated images
49. Use collision detection between objects – I will likely need to use this for most aspects of interaction for the fish, food, and spear