Duck Typing

### Duck

1. Create three total fields, a fourth one has already been made for you.
2. A score variable starting at 0, all ducks \*share\* this.
3. A lives left variable starting at 10, all ducks \*share\* this.
4. A velocity variable starting at 0.0.
5. In the Duck’s Act method:
6. Teleport slightly down the screen. Use the velocity variable to represent how far down the screen to move. Use getExactX() and getExactY() to get the double values instead of the integers for location.
7. Increase your velocity a tiny amount (maybe 0.1, you can play with this value).
8. Check if the duck is hitting a Gator…if so…
9. If so, remove one from the lives variable.
10. Display the number of lives left at (250, 50).
11. Play the quack.mp3 sound.
12. Remove the duck from the screen.

Otherwise…ask if the correct key for the Duck is being pressed.

1. If so, increase the score.
2. Display the current score at (750, 50).
3. Remove the duck from the screen.

### Water

1. Create one field called duckPercent, it will store a decimal value.
2. In the Water’s constructor:
3. Set the duckPercent to 0.005
4. Add a bunch of Gators at the bottom of the screen using a loop.
5. In the Water’s act method:
6. Check if a random number is less than the duckPercent…if so…
7. Build a new duck.
8. Place the new duck at a random x coordinate from 50-950 and a y coordinate of 50.
9. Increase the duckPercent by a small amount (0.0003)

### Magic Numbers

Each number listed above is a ‘magic number’. A magic number is a number sitting in your code which is not intuitively explained at a glance. Each of these should really be a variable (in particular, a static final variable is usually the best option). By placing these in variables with good variable names, and replacing all the numbers in the code with variable names, it becomes easier to read the code and understand what is happening. It also makes for a nice place to easily edit the numbers if you do not like how they are working. Perhaps you do not like how fast or slow the ducks begin spawning, or how fast they increase, or how many lives you start with. It would be much easier to find these at the top of your code in a group of fields rather than searching all throughout the code to find them.

Adjust your program to remove the magic numbers. Then, play with the numbers until you have values that you like for variable options.

### Gators

The Gators do not need to do anything. But for added affect, you can make them slide across the bottom of the screen and reappear at the left when they hit the right.