

Bouncing Balls Lesson - With Classes

This lesson introduces/revises the topics of classes.

To start with let's set up a project with two files, as shown below:

```

BouncingBall | Ball ▼
1 Ball myBall;
2
3 void setup() {
4   size (800, 600);
5   myBall = new Ball();
6 }
7
8 void draw() {
9   background(0);
10  myBall.display();
11 }
12

```

```

BouncingBall | Ball ▼
1 class Ball {
2   float x = 0;
3   float y = 0;
4   float speedX = 5;
5   float speedY = 5;
6
7
8   void display() {
9     ellipse(x, y, 20, 20);
10  }
11 }
12

```

On the right we have the definition of our class Ball. We've set it up with a single method, "void display()". We also have some variables of type "float" (these are numbers which can have decimal places).

Your task is to add some additional functions to the Ball class:

- void move() - add speedX to x, and speedY to y.
- void bounce() - multiply speedX by -1 when the ball hits a side, and speedY by -1 when the ball hits the top or bottom of the screen.
- void gravity() - add 0.2 to speedY.
- void run() - call each of the above functions, and void display().

Then you need to call run() instead of display() in void draw().

Next, add a "constructor" like this. This has the *exact* same name as the class, and can take in numbers when you call "new".

```

8 Ball(float _x, float _y) {
9   x = _x;
10  y = _y;
11 }
12

```

You call the constructor with *arguments* like this:

```
5  Ball(000, 000);  
6  myBall = new Ball(400, 400);  
7
```

Extra Tasks

- Set up an ArrayList of balls so that you can have a whole heap of them bouncing around at once.
- See that funny error when the ball gets to the bottom? Fix it!
- What happens if two balls collide? Can you compare every ball in the arraylist to every other ball in the arraylist, and make them bounce back off each other when they collide?