Lesson 13: Booleans

What is a `Boolean`?

`Boolean`s are a type of variable. What is the other type of variable that we have worked with?

(look back over previous sheets if you are unsure of the answer - note they are sometimes used to control the positions or size of a shape.)

While `int` variables contain numbers, any whole number! (The position or the size for example,) `Boolean`s can be only `true` or `false`. That's all.

How do we make `Boolean` variables?
Very similar to making `int` variables:

```
Boolean moveBallLeft = true;
```

This makes a variable, called "`moveBallLeft`", its value is `true`.

Why would we use a `Boolean`?
`Boolean`s are normally used in `if` statements, see the below example

```
Boolean moveBallLeft = false;
int circleHozPos =0;
void setup(){
  size(500,500);
}
void draw(){
  fill(255,255,0); //colour yellow
  ellipse(circleHozPos,200, 200,200); //make ball
  if(circleHozPos>= 500){  //if ball hits right side
    moveBallLeft = true;
  }
  if(moveBallLeft == true){
    circleHozPos = circleHozPos -3;  //move left
  }
  if(moveBallLeft == false){
    circleHozPos = circleHozPos +3;  //move right
  }
}
```

Code the above example and see what it does.

Tasks:

Note: following on from the last lesson - each program should have comments every 2-3 lines!

1. Make additions to the above program:
    a. so you only see one ball at a time.
    b. So that the ball bounces off the left hand wall as well as the right hand one. To do this you will need:
        i. To know at what point the ball hits the left side. (Look at the condition for the right wall for a hint)
        ii. A new `if` statement with this as the condition
        iii. What to change when the ball hits the left wall (hint its a `Boolean`.)
    c. So the ball changes direction when the edge of the ball hits the side not the middle. (For both left and right.)

Extra work if you are finished early (as an instructor if you should do this)

2. Make a new program with a rectangle that bounces off the top and bottom of the screen.
    a. It should only bounce on the edges of the rectangle
    b. Each time it hits the bottom its speed goes down by one, so it slows down and finally stops. (Needs a speed variable)
    c. Make a new `Boolean` so that when the speed goes to 0, a “game over” screen appears (different background etc) - and you cannot see the rectangle any more.