Lesson 18: Custom functions

Lesson aim:

To learn custom functions - these are a key part of programming, they make your code a lot easier to read and use.

Why:

We have used functions in all of our programs - but those are all functions already defined by processing - now we want make our own functions, out of existing functions.

Creating custom functions

Custom functions are like the functions we already know: `size()`, `ellipse()`, `rect()`, `background()` etc., except we name them and we decide what they do.

For example, imagine we wanted to make a function that drew a red ball, called "`drawRedBall()`", we would define that custom function like so:

```
void drawRedBall() {          //← start of drawRedBall code block
  fill(255, 0, 0);
  ellipse(200, 200, 100, 100);
}                             //← end of drawRedBall code block
```

Like `void setup()`, `void draw()` and `if` statements - custom functions have all of their code in ***{code blocks}***, which is code that goes after **{** and before **}**.

How would we use custom functions?

```
int ballHozPos;  // controls the horizontal position of the ball
int ballVertPos; // controls the vertical position of the ball
int ballSize;
void setup() {
  size(800, 400);
  ballHozPos = 400;
  ballVertPos = 200;
  ballSize = 100;
}

void draw() {
  drawBackground();     //← call custom function "drawBackground()"
  drawRedBall();        //← call custom function "drawRedBall()"
  moveBall();           //← call custom function "moveBall()"
}
//Below we define the new custom functions.

void drawBackground() {    //← start of drawBackground() code block
```

```
  background(30);
}                           //← end of drawBackground() code block

void drawRedBall() {        //← start of drawRedBall() code block
  fill(255, 0, 0);
  ellipse(ballHozPos, ballVertPos, ballSize, ballSize);
}                           //← end of drawRedBall() code block

void moveBall() {           //← start of moveBall() code block
    //your code goes here
}                           //← end of moveBall() code block
```

Tasks:

1. Copy the above and add code. What happens? Why?
2. Add in code in the "`moveBall`" function, to make the ball move from left to right, and from top to bottom.
3. Add in a `drawBlueSquare`() custom function, and call that as well.
4. Add in a `moveSquare`() custom function
5. Add a `drawFace()` or `drawShip()` or `drawHouse()` custom function, with at least 6 instructions in the custom function.

Why use custom functions?

- To organise code in small chunks that do a specific task. This gets more and more important as your programs get bigger and bigger.
- To improve the readability of your code. As shown in the draw function above-just reading that, you know exactly what is going to happen from a single glance:

```
drawBackground();
drawRedBall();
moveBall();
```

Project task:

Go back to your project and add in at least 4 custom functions. Going back and organising code to make it better and more readable than it was is called *refactoring code.*