

Lesson 9: While Loops

Lesson aim:

To learn a new tool - **while** loops. They are a bit like if statements.

Why:

We will be using **while** loops almost as often as if statements (if not more). If statements and while loops are the two foundational logic tools in programming.

While loops

while loops are like if statements. They are bits of programming logic with a **{codeBlock}** following them, and they allow you to do complicated things more easily.

while loops allow you to do **many repetitive things without writing lots of code**. As you might imagine, it executes the contents of its code block **while a certain condition is true**.

understanding a while loop example:

Lets look at an example, and see how it works.

```
int ellipseNumber = 0;
size(550,200);
while(ellipseNumber <6 ){
  ellipse(ellipseNumber * 100, 100, 100,100);
  ellipseNumber = ellipseNumber + 1;  //key line
}
```

- What happens?
- Change the value of `ellipseNumber` , what happens?
- Change the 6 in the condition :`(ellipseNumber <6)` what happens?
- Change `ellipseNumber = ellipseNumber + 1;` to:
`ellipseNumber = ellipseNumber + 2;` What happens?

So we can summarize the while loop below:

```
while(//condition in here is true){
  //execute the following {codeBlock}
}
```

Tasks:

- Change the above example so that a **10** circles are shown, instead of 6.
- Make a new program that makes **8 squares**, going down the screen - rather than across.
 - Make the colour of each square **random** (different colours for each square).
 - Hint need a **fill** in the **{codeBlock}**
 - Make the squares go diagonally across the screen rather than just down.

- Make 20 lines that go across the screen.
 - Make the width of the lines random - like a barcode!



While loops in while loops?

Use multiple while loops to make a grid of items.

```
int hozEllipseNumber = 0;
int vertEllipseNumber = 0;
size(550, 550);
while(hozEllipseNumber <6 ) {
  while(vertEllipseNumber <6 ) {
    ellipse(hozEllipseNumber*100, vertEllipseNumber*100, 100, 100);
    vertEllipseNumber = vertEllipseNumber + 1;
  }
  vertEllipseNumber = 0;    //key line
  hozEllipseNumber = hozEllipseNumber + 1;
}
```

Task:

- Using our quotes.txt file, load up the file into an array and use a while loop to print **all** of the lines to the screen.
- Moving balls - remember our single ball moving exercise for term 1? Use a while loop to make **5 balls all move across the screen together**.