

## Baker's Dozen

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**Aim:** How can while loops make our code more efficient?

### Agenda:

Motivation: Annoying task  
(5 mins)

Mini-lesson: While Loop  
(10 mins)

Groupwork: While Loop practice  
(25 mins)

Closing: Answer the aim  
(5 mins)

**Motivation:** Give students 3 minutes to accomplish this task

p5: Make an image with 30 evenly-spaced circles

Snap: Make an image with 30 evenly-spaced circles

Java: Print all the numbers from 1-30 on separate lines of code

Discuss: Did you finish in 3 minutes? How did you feel while you were doing this?  
This code is really inefficient– it's long and repetitive. We're going to look at another way to do this. What if I told you that I could make 100 circles/numbers in under 30 seconds?

Write code to make 100 circles. Bam.

Aim: How can loops make our code more efficient?

### Mini-lesson:

Loop: Code that repeats a sequence of instructions

Show while loop example

#### Java

```
int x=1;  
while (x < 100){  
    System.out.println(x);  
    X = x+1;  
}
```

#### JavaScript p5

```
var x=50;  
while (x < 100){
```

```

    ellipse(x,100,100)
    x = x + 50;
}

```

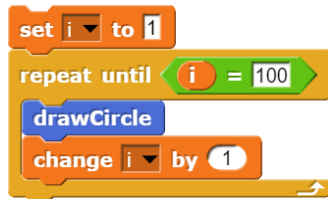
## Python

```

x= 1
While x <100:
    print(x)
    x= x+ 1

```

## Snap!



Discuss structure:

Declare a variable

Check a condition

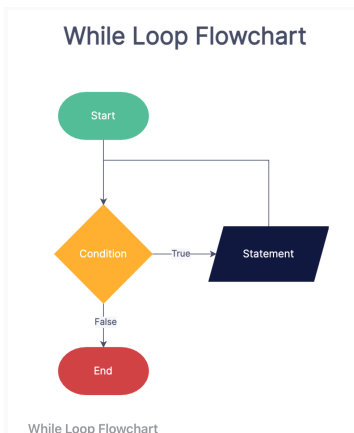
If it's true, do something and increase variable by 1 (50 for p5)

If it's false, stop and exit the loop.

Q: In this example, what is our condition?

Q: When is this condition true? When is it false?

Q: What would I change if I only wanted to print ten numbers/circles?



## Groupwork:

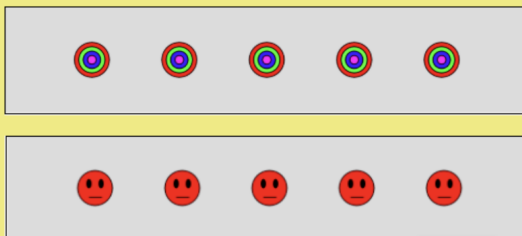
At some point it is likely that a student will create an infinite loop. When this happens: One common problem in CS is an infinite loop (where the loop keeps going forever and never stops). Did anyone else experience this? What causes an infinite loop to occur?

## p5.js

### Take a challenge!

#### Mild 🌶️ Challenge:

Recreate one of the following designs using a while loop.



#### Spicy 🌶️ 🌶️ 🌶️ Challenge:

- Try to make the ellipses start from the right side of the screen
- Space them 50px apart
- Draw ellipses only on the *left half* of the canvas (spaced as you wish!)

Leave some comments about what you attempt

## Snap!

### Part 1: Brick by Brick

1. Write a Snap! script to draw a single 20x10 "brick" in the lower left corner of the stage when the green flag is clicked.
2. Modify your script to draw two bricks side by side. The bricks should share a short edge, like this:



3. Now modify your script again to build a full row of bricks across the entire length of the stage. Use a loop to keep your script as concise as possible. Remember that the stage is 480 pixels wide.

As a group choose one of the following while loops;

- Repeatedly print the value of the variable xValue, decreasing it by 0.5 each time, as long as xValue remains positive.
- Print the value of the variable, the numbers 0 - 10, after its been multiplied by 3
- Repeats a block of code as long as the user indicate they want it to.
- Drive the user crazy by insisting they re-enter a particular input no matter what they enter. Be creative.

**Closing:** Wrap up discussion -- emphasizing that iteration is a foundational part of CS, done so using while loops but they have some disadvantages (lead in to for loops). ←Do we want them to answer the aim Q or no?

**Next Lesson:** For loops