

Duck, Duck, Loops

Loop de Loop

Ready to loop around for another trip at Patteron? Today, Pancho will show you the fabulous fun of for loops!

What are For Loops?

A **for loop** is a type of loop that repeats a set of instructions a specific number of times. For loops have a **definite iteration**, which means that the number of repetitions is already specified in advance.

More specifically, for loops have a **start**, an **end**, and an **increment** value to keep track of how many times to repeat its instructions. An **increment** is the number we want to increase our count by.

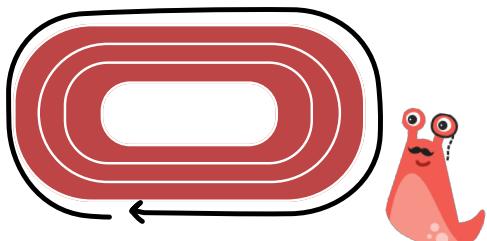
It may look like a bunch of wacky symbols at first glance, so follow along to see how we can break this down!

start ↓	end ↓	increment ↓
For count = 0, count == 5, count++: Do a jumping jack		

Reading this in English, the for loop uses a variable “count” to control the loop. The loop sets count equal to 0, stops counting when count equals 5, and increases count by 1 once you have done a jumping jack.

Gym Class

Let's look at an example. Every day, Pancho loves to run around his school track. For his workout today, Pancho will be running 3 laps increasing his speed by 0.2mph each time. Here's how to represent this in a for loop:



First Pancho jots down the start, end, and increment:

Start = 0 laps (we're starting with 0 laps)

End = 3 laps (we want to count until 3 laps)

Increment = 1 lap (we're counting lap by lap)

Now, we place this information into our for loop. We start our variable `count` at zero, stop counting when it reaches 3, and increase `count` by 1 each time we complete the instructions (increase speed by 0.2mph and run 1 lap).

For loop syntax:

start	end	increment
\downarrow	\downarrow	\downarrow

For `count = 0`, `count == 3`, `count++`:
 Increase speed by 0.2mph
 Run 1 lap



What's happening:

Start -> count = 0
 Increase speed by 0.2mph
 Run 1 lap
count = 1
 Increase speed by 0.2mph
 Run 1 lap
count = 2
 Increase speed by 0.2mph
 Run 1 lap
count = 3 -> Stop!

Counting by miles

Surprise, Pancho's coach now has a new workout for him! Pancho will be running 4 miles increasing his speed by 0.3mph each mile. Instead of counting by laps, Pancho now wants to count by miles. 1 mile is 4 laps around the track.

Start = 3 laps (Pancho has run 3 laps so far)

End = 15 laps (we want to run a total of 4 miles and 3 laps $\rightarrow 12+3 = 15$ laps)

Increment = 4 laps (we're counting in increments of 1 mile = 4 laps)

For loop syntax:

start	end	increment
\downarrow	\downarrow	\downarrow

For `count = 3`, `count == 15`, `count+=4`:
 Increase speed by 0.3mph
 Run 4 laps



What's happening:

Start -> count = 3
 Increase speed by 0.3mph
 Run 4 laps
count = 7
 Increase speed by 0.3mph
 Run 4 laps
count = 11
 Increase speed by 0.3mph
 Run 4 laps
count = 15 -> Stop!

Duck, Duck, Loops

Materials

- A pair of dice 

How to Play

- Sit in a circle with a group of 4-10 people.
- Choose one player to be *It*. Every turn, *It* will roll the pair of dice. The increment will be the 1st number and the end value will be the 1st number times the 2nd number.
- The player will walk around the circle, tapping players on the head based on the increment and saying duck. Once they reach the end number, he/she says "goose," The goose runs after *It*, trying to tag them before *It* takes their seat.
- If *It* successfully reaches the goose's seat without being tagged, the goose is the new *It*. If the goose tags *It*, then the goose keeps his spot in the circle and *It* continues being *It*.

