Name: _____ Date: _____

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 the number of repetitions is 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 a 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!

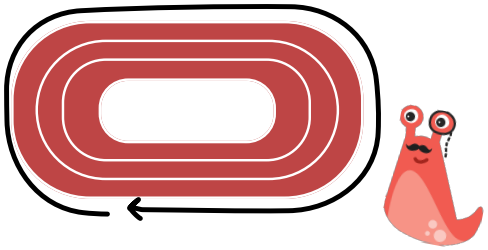
start ↓ end ↓ increment ↓

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 the 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. Pancho will be running 3 laps for his workout today, 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 ↓

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 0.3 mph every 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 -> 12+3 = 15 laps)
Increment = 4 laps (we're counting in increments of 1 mile = 4 laps)

For loop syntax:

start ↓ end ↓ increment ↓

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 the tapper. Every turn, the tapper 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 tapper 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" to make the player the goose. The goose then runs after the tapper, trying to tag them before the tapper takes their seat.
- If the tapper successfully reaches the goose's seat without being tagged, the goose is now the new tapper. However, if the goose tags the tapper, then the goose keeps their seat in the circle and the tapper continues tapping.