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 loops** repeats actions over and over, for a specified number of times.

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

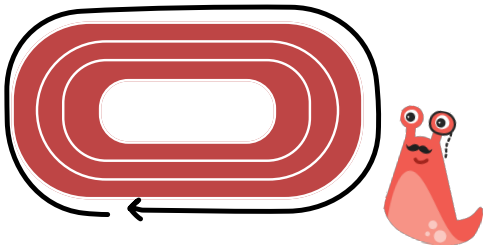Follow along to see how we can make our own for loops!

```
        start   end              increment
          ↓      ↓                   ↓
For counting from 0 to 5 and incrementing by 1,
Do a jumping jack
```

Let's break this down! The for loop counts from 0 and begins to perform the action below, which is to do a jumping jack. Once that is complete, they increment the count by 1, making 0 now 1. We continue this until we count to 5, our end value.

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 his workout in a for loop:

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

Start at 0 laps (we're starting with 0 laps)
End at 3 laps (we want to count until 3 laps)
Increment by 1 lap (we're counting lap by lap)

Pancho's Energetic For Loop Workout

Now, we place this information into our for loop. We start counting at 0, stop counting when it reaches 3, and increase our count by 1 each time we complete the action (increase speed by 0.2mph and run 1 lap).

> For counting from **0** to **3** and incrementing by **1**,
> Increase speed by 0.2mph and run 1 lap

- **Our count is 0 (our starting value)**
  Pancho increases his speed by 0.2 mph and runs 1 lap
- **Our count is 0 + 1 = 1**
  Pancho increases his speed by 0.2 mph and runs 1 lap
- **Our count is 1 + 1 = 2**
  Pancho increases his speed by 0.2 mph and runs 1 lap
- **Our count is 2 + 1 = 3 (our end value), so we 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.

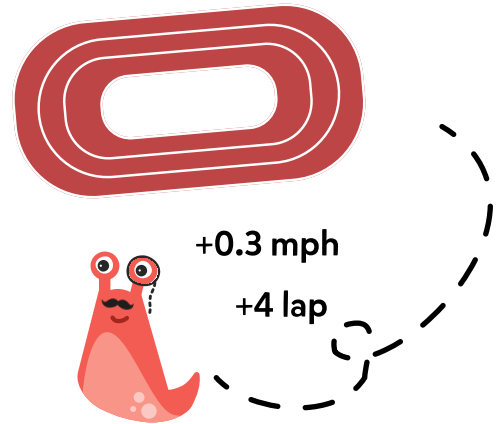**Start** at 3 laps (Pancho has already run 3 laps so far)
End at 15 laps (we want to run a total of 4 miles and 3 laps, equaling 15 laps)
Increment by 4 laps (we're counting in increments of 1 mile = 4 laps)

Pancho's New For Loop Workout

For counting from **3** to **15** and incrementing by **4**,
Increase speed by 0.3mph and run 4 laps

- **Our count is 3 (our starting value)**
  Pancho increases his speed by 0.3 mph and runs 4 laps
- **Our count is 3 + 4 = 7**
  Pancho increases his speed by 0.3 mph and runs 4 laps
- **Our count is 7 + 4 = 11**
  Pancho increases his speed by 0.3 mph and runs 4 laps
- **Our count is 11 + 4 = 15 (our end value), so we stop!**

+0.3 mph

+4 lap

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.