

Francisco Velazquez

IGN Code Foo^2

school bus filled with ping-pong balls

## Introduction

How many ping-pong balls would it take to fill an average-sized school bus? Now that is an interesting question that boggled my mind. Why would you like to fill a school bus with ping-pong balls? I don't know, but let's pretend that at the end of the day, we will put those ping-pong balls to a good use; like beer pong, or I mean, table tennis. Now before diving into any calculations, many assumptions need to be made, like defining what the dimensions of an average-sized school bus are. Since school buses are made to transport people, let us assume there are seats in there too. With that information, it is then possible to put concepts of volume into practice.

## Assumptions

School bus dimensions: 6.5 ft Height, 30 ft Length, and 8 ft wide.

As a high school student I spent many days riding the bus to and from school. I know that the dimensions inside are large enough to make a 6ft tall person feel comfortable. I remember there being 12 seats per side, making a total of 24.

School bus seat dimensions: 10 cubic feet

Seats should accommodate two people. Sadly some prefer to sit at the edge of the seat to avoid sharing a seat. Social outcasts!

Diameter of a ping-pong ball: 1.5 inches

While attending college I had my fair amount of beer pong playing matches.

## Calculations

Based on my assumptions:

1. The volume of my ping-pong ball would be about 1.8 cubic inches

$$V_{ball} = \frac{4}{3} \pi r^3 = \frac{4}{3} \pi \left(\frac{1.5in}{2}\right)^3 \approx 1.8 in^3$$

2. The volume of the inside of my bus would be 1560 cubic feet

$$V_{bus} = 6.5 ft * 30 ft * 8 ft = 1560 ft^3$$

3. Convert the volume of the bus from cubic feet to cubic inches

$$1560 ft^3 * \frac{(12in)^3}{(1ft)^3} = 1560 * 1728 in^3 = 2,695,680 in^3$$

4. Subtract the seat volume

$$V_{seat} = 10 ft^3 * 24 seats = 240 ft^3 = 240 ft^3 * \left(\frac{12in}{1ft}\right)^3 = 414,720 in^3$$

$$V_{bus'} = 2695680 in^3 - 414720 in^3 = 2,280,960 in^3$$

5. Calculate the number of ping-pong balls that would fit in the total space available

$$balls = \frac{2280960 in^3}{1.8 in^3} \approx 1,267,200 balls$$

6. Further assume that there will be 25% of empty space because of “ball packing.”

$$1267200 * .75 \approx 950,400 balls$$

## Conclusion

Based on my calculations, it would take about 950,400 balls to fill an “average-sized school bus.” Now we can go ahead and celebrate by playing a match of beer pong, I mean table tennis. (Drink responsibly)