Ping Pong Balls in a School Bus

In order to estimate how many ping pong balls would fit in a typical school bus, one needs the equation:

where is the volume of the ping pong ball, is the volume of the bus, and n is the number of balls. So, to find the number of balls:

To estimate the volume of the ping pong ball, one needs the equation for the volume of a sphere:

where r is the radius of the ball. The radius of a ping pong ball is about 2 cm.

r

The volume of the interior of the school bus can be approximated by the volume of a rectangular prism, with dimensions of about 14 m long, about 2.5 m wide, and about 2 m tall. Inputting these estimated values the number of ping pong balls comes out to 55,704. An additional step would be to account for the benches. A typical bus has two benches per row and about 15 rows. If two kids sit on each bench, this gives a bus with a 60 passenger capacity, which is reasonable. The volume of the bench can be estimated as two rectangular prisms.

For simplicity’s sake, let’s assume that the two prisms are about the same size and that the volumes of legs are negligible. The dimensions of one of these prisms are about 12 cm thick by 50 cm wide by 1 m long. As a sanity check, two benches side by side would be 2 m long, which leaves 50 cm for the aisle. Also, 15 benches down the length of the bus would be (0.5+0.12)\*15 m = 9.3 m (the total length of the bench is the length of one prism plus the thickness of the other), which leaves about 30 cm of legroom per seat. These values seem reasonable and consistent, so we will continue. The total volume of two benches (which is comprised of two prisms) in 15 rows is about 3.6 m3. The number of ping pong balls then becomes

which gives about 52,840 ping pong balls. I’ll round this down to 52,500 to give a conservative number.

Out of curiosity, I wondered how much all those balls would weigh. A standard ping pong ball weighs 2.7 grams. Using my conservative estimate, this gives 142 kg, which is about 313 pounds. So all of those balls equal the weight of only 3 or 4 kids (or one bus driver with a whole bunch of inertia)!