

12-2**Real-Life Career Activity****Commercial Driver**

Tractor-trailer drivers are commercial drivers who carry cargo long distances across the country. As well as knowing how to drive a large truck and trailer, they must also know how to calculate the weight of the cargo they are carrying. Many roads and bridges have weight restrictions so the driver must know the total weight of the vehicle. A truck driver can use the formula below to calculate the weight of the truck's cargo, assuming that the truck is completely full.



$$W = \ell whp$$

In this formula, W is the total weight of the cargo, ℓ is the length of the cargo bay, w is the width of the bay, h is the height of the bay, and p is the weight in pounds per cubic foot of cargo. The driver uses a weight table to look up the weight in pounds per cubic foot of cargo to be carried. Here is a sample weight table for some items.

Material	lb per ft ³	Material	lb per ft ³
apples	40	cocoa beans	37
red brick	120	butter	54
cement	94	gravel	95

Suppose a truck has a cargo bay 10 feet wide, 25 feet long, and 8 feet high. What weight of apples will fill the cargo bay?

$$\begin{aligned} W &= 25 \times 10 \times 8 \times 40 \\ &= 80,000 \end{aligned}$$

The cargo bay will hold 80,000 pounds of apples.

Solve.

- Suppose a truck has a cargo bay 10 feet wide, 20 feet long, and 8 feet high. What weight of butter will fill the cargo bay?
- Suppose a truck has a cargo bay 8 feet wide, 25 feet long, and 7 feet high. What weight of gravel will fill the cargo bay?
- Suppose a truck has a cargo bay 9 feet wide and 20 feet long. The truck is carrying 126,900 pounds of cement. What is the height of the cargo bay?