Guide to: Pressure

maths Links

Explanation:

Pressure, force and area are linked by **Pressure** $= \frac{\textbf{Force}}{\textbf{Area}}$, **Force = Pressure × Area**, and **Area** $= \frac{\textbf{Force}}{\textbf{Pressure}}$. Force is measured in **Newtons (N)** and area in $\textbf{m}^2$ or $\textbf{cm}^2$, giving pressure in $\textbf{N/m}^2$ (Pascals, Pa) or $\textbf{N/cm}^2$.

Remember that **Area** is only the flat contact area touching the ground, not the total surface area of the 3D object. A smaller contact area produces a **greater pressure** for the same force.

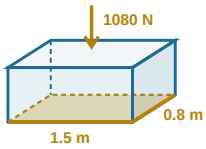
Example 1: A crate of weight **1080 N** rests on a rectangular base measuring **1.5 m by 0.8 m**. Work out the pressure on the floor in N/m^2.

Solution:

Base area = 1.5 × 0.8 = **1.2 $\textbf{m}^2$**

P = 1080 ÷ 1.2 = 900

Answer: 900 $\textbf{N/m}^2$



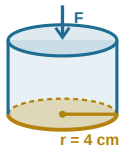
Example 2: A cylinder of radius **4 cm** stands flat on a table and exerts a pressure of **2.5 $\textbf{N/cm}^2$**. Find the force exerted on the table (to 1 d.p.).

Solution:

Area = $\pi(4^2)$ = **16π $\textbf{cm}^2$**

F = 2.5 × 16π = **40π N**

Answer: 125.7 N (1 d.p.)



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