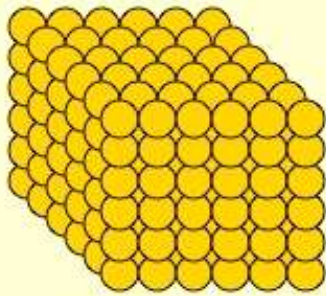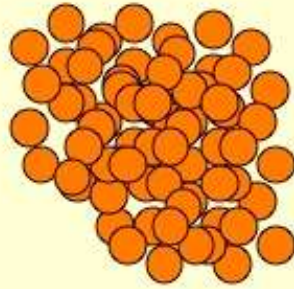Density is the mass of the matter in a given volume.

density · volume = mass

HIGH DENSITY
particles are packed together
tightly - not much space between.

(Will sink easily, e.g. iron nail)

LOW DENSITY
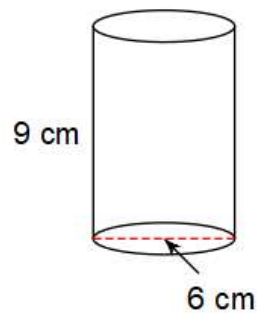particles are loosely packed
together - more space between.

(Will float more easily, e.g. wood)

Metal	Density
Aluminum	2.81 g/cm³
Copper	8.97 g/cm³
Lead	11.30 g/cm³
Platinum	21.40 g/cm³
Sodium	0.97 g/cm³
Gold	19.30 g/cm³

Material	Weight
Water	63 lbs/in³

Example 1:

Find the mass of a solid cylinder of copper that has a height of 9 cm and a diameter of 6 cm.

9 cm

6 cm

We should start by drawing a picture of the cylinder:

$V = BH$

The base is a circle, so the area of the base (B) can be calculated using $A = \pi r^2$.

$A = \pi(3)^2$ **A circle with a 6-cm diameter has a radius of half of 6, or 3 cm.

$A = 9\pi$

$B = 9\pi$

$V = (9\pi)(9)$

$V \approx 254.47 \text{ cm}^3$

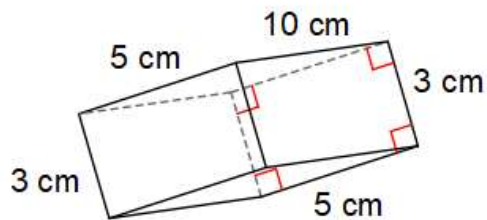density $\cdot$ volume = mass

The density of copper is 8.97 g/cm³.

$\left(\dfrac{8.97g}{cm^3}\right)(254.47cm^3) = mass$

$2{,}282.60\ g = mass$

The cylinder will have a mass of **2,282.6 grams**.

Example 2:

Find the mass of a solid rectangular prism of lead with dimensions of 10 cm by 5 cm by 3 cm tall.

We should start by drawing a picture of the prism:

$V = BH$

The base is a rectangle, so the area of the base (B) can be calculated using $A = bh$.

$A = (5)(10)$

$A = 50$

$B = 50$

$V = (50)(3)$

$V = 150 \text{ cm}^3$

density $\cdot$ volume = mass

The density of lead is 11.30 g/cm^3.

$\left(\dfrac{11.30g}{cm^3}\right)(150 \ cm^3) = mass$

$1{,}695 \ g = mass$

The prism will have a mass of **1,695 grams**.