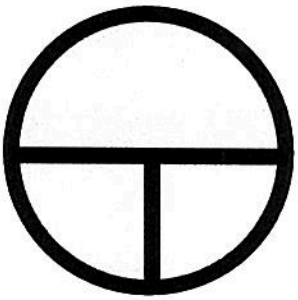
What is Density?



The density of a substance is the relationship between the mass of the substance and how much space it takes up (volume).

$D = \frac{Mass}{Volume}$

1. A rectangular solid has a volume of $40m^3$. The mass of this solid is 300 grams. Given this information, calculate its density.

$D = \frac{300 grams}{40 m^3}$

$D = 7.5\ g/m^3$

2. A rectangular piece of wood that measures 3.0cm by 6.0cm by 4.0cm has a mass of 80.0 grams. What is the density (grams per cubic centimeter) of the wood? (to the nearest tenth)

$V = l \cdot w \cdot h$

$V = 3 \cdot 6 \cdot 4$

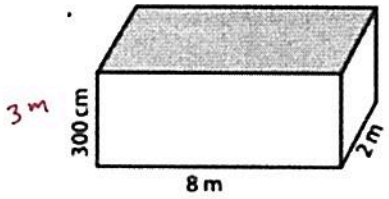
$V = 72\ cm^3$

$D = \frac{M}{V}$

$D = \frac{80 grams}{72 cm^3} = 1.1\ g/cm^3$

Practice Problems

3. Find the volume of the figure below. Your answer should be in m^3.



$\frac{300 cm}{x inches} = \frac{2.54 cm}{1 in}$

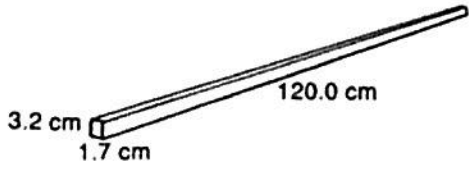
118.11 inches

$\frac{118.11 in}{x meters} = \frac{39.37 in}{1 m}$

3 m

$3 \cdot 8 \cdot 2 = 48\ m^3$

4. If 1 cm^3 of iron has a mass of 7.52 g, what is the mass of an iron bar of rectangular cross section with the dimensions shown?

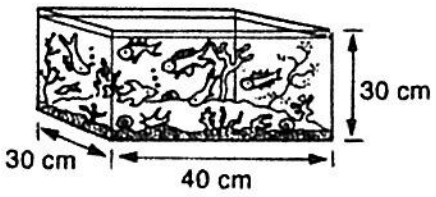


$V = l \cdot w \cdot h$

$= 3.2 \cdot 1.7 \cdot 120$

$= 652.8\ cm^3 \cdot 7.52 = 4909.056$ grams

5. If one guppy requires 5 L of water to live happily, what is the maximum number of guppies that should be kept in his aquarium?



$V = l \cdot w \cdot h$

$V = 36000\ cm^3$

$\frac{36000\ cm^3}{x\ liters} = \frac{1000\ cm^3}{1\ liter}$

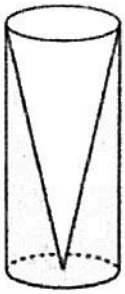
$1000x = 36000$

$x = 36$

$\frac{36}{5} = 7.2$

7 guppies!

6a. Walter wants to make 100 candles, each in the shape of a cone for his new candle business. The mold shown below will be used to make each candle. Each mold will have a height of 8 inches and a diameter of 3 inches. To the nearest cubic inch, what will be the total volume of 100 candles?



b. Walter goes to a hobby store to buy the wax for his candles. The wax costs \$0.10 per ounce. If the weight of the wax is 0.52 ounce per cubic inch, how much will it cost Walter to buy the wax for 100 candles?

7. A contractor needs to purchase 500 bricks. The dimensions of each brick are 5.1 cm by 10.2 cm by 20.3 cm, and the density of each brick is 1920 kg / m^3 . The maximum capacity of the contractor's trailer is 900 kg. Can the trailer hold the weight of 500 bricks? Justify your answer (100cm = 1 m)